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DECEMBER 2018

CLEVELAND COUNTY

Parking Strategic Plan

City of Norman, Oklahoma

Final Report

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1. Executive Summary

Introduction

In the summer of 2017, Cleveland County (County) and the City of Norman (City) engaged Kimley-Horn and Associates (Kimley-Horn) to develop a Parking Strategic Plan for downtown Norman, Oklahoma. This plan has a strong focus on program organizational options as well as identifying both short and long-term goals for the development of a forward-thinking and holistically-managed public parking system that will support the County and City's larger economic and community development goals, today and in the future.

Project Objectives

The primary goal of this Parking Strategic Plan is to be a guide for decision makers on topics such as governance, technology, enforcement, as well as planning and parking asset development and management. Specific project objectives include providing strategies and tools to:

- Identify governance and management structures that will work best for Cleveland County and the City of Norman and will contribute to the successful implementation of other recommendations
- Improve parking management and the public perceptions of downtown parking
- Position parking as a contributor to continued downtown redevelopment and economic expansion
- Provide recommendations on establishing positive and proactive customer service
- Explore the range of parking management strategies that can be used by County and City staff to encourage on-street parking turnover and promote increased downtown vitality without unduly penalizing infrequent violators
- Identify technologies that can improve customer services and convenience, while also controlling operating costs
- Position parking management within the larger "access management" context in a way that promotes a balanced system of parking and transportation alternatives.
- Understand the opportunities, challenges and potential synergies between the County/City and the University of Oklahoma (OU) parking and transportation programs.

Key Findings

What the emerging parking program currently needs most are the following nine key elements:

1. **A sense of purpose and direction relative to parking and transportation policy** – This strategic plan should provide that missing element.
2. **A strong and capable program leader** – The recruitment and hiring of a new parking manager is seen as a vital initial step to creating an effective and sustainable parking management program.
3. **Establish parking as a separate fund** and dedicate all parking related revenue streams to support the fund. This recommendation is made with a goal of creating a program that can potentially be self-funding in the long-term.
4. **A strong customer service orientation** – One of the key leadership elements that needs to be infused into the program from the beginning is a strong customer service focus. This applies not only to staff training but also to facilities maintenance and investments in new technologies. Parking can play a key role in improving the perception and the experience of downtown overall. Collaboration and partnerships between the County and the City as well as other key groups such as the Norman Downtowners Association and the Campus Corner Merchant's Association, etc. will be an important component of this initiative.
5. **A focus on "mastering the fundamentals" of parking management** – While related to the training and staff development element, this focus area is really about gaining an in-depth understanding of the many complex and challenging aspects that are somewhat unique to parking. Chapters 5, 6 and 7 of this report introduces a recommended parking management framework built around the 20 specific program categories in our "20 Characteristics of Effective Parking Management Programs" approach (see Appendix #1). This document provides a framework that can form the basis for a comprehensive and strategic program development approach.
6. **Investment in new technology** – Leveraging new technology will be a critical element in achieving many of the stated goals of this project including:
    a. Enhanced customer friendly programs and services
    b. Improved operational efficiency
    c. Enhanced system financial performance
    d. Improved system management and planning
7. **Development of a strong parking maintenance program** with regularly scheduled facility condition appraisals, the creation of parking facility maintenance reserves and an effective facilities maintenance program are essential to creating a positive image of the parking program and downtown overall.
8. **Development of an on-going and collaborative relationship with the University of Oklahoma (OU)** and other local higher education organizations to enhance residential parking permit programs and improve neighborhood parking enforcement.
9. **Over time, expand the parking program's mission to adopt a broader more "mobility management" oriented perspective**. Also work closely with County/City Planning to address parking requirements (zoning code) and ADA parking placard abuse reforms.

Recommended Parking Program Organizational Model

In Chapter 5 of this report, Kimley-Horn and Associates, Inc. provides extensive sections on parking program operational methodologies and successful organizational models. We assessed and ranked each of the major organizational models in terms of which would be the best fit for Cleveland County and the City of Norman. The table below summarizes our organizational options assessment:

Cleveland County / City of Norman - Organizational Model Analysis

		Integrated City/County District / Commission	BID/DDA Contract Management	Multi-Jurisdictional Parking	Professional Services / Out-Sourced	Hybrid Professional Services / Out-Sourced Mgmt.
	Status Quo	Model	Model	Authority Model	Mgmt. Model	Commission Model
Supports Economic Revitalization	1	8	8	8	8	8
Most Efficient and Cost Effective	4	7	6	5	8	8
Most Customer Friendly	2	6	6	6	6	6
Most Politically Feasible	2	8	3	6	7	8
Most Focused on Vision	2	7	5	7	7	8
Easiest to Achieve	8	6	4	5	5	7
Most Responsive to Business & DT Stakeholders	2	7	6	7	5	7
Most Financially Viable	8	7	4	6	6	8
Most Effective Coordination	2	6	4	6	5	5
Provides Needed Parking Management Expertise	2	5	5	5	9	9
Best Promotes Long-term Growth	2	8	3	9	7	8
Facilitates Intergovernmental Coordination	2	7	2	7	6	7
Supports the Principal of "Vertical Integration"	2	8	5	8	6	8
Facilitates DT Re-Branding / Integration with DT Master Plan Goals	2	6	3	6	6	6
Promotes Alternative Transportation and Multi-modal Transportation Options	1	5	2	5	4	5
Fosters Innovation and Mission Broadening	2	7	3	7	5	7
Effectively Identifies and Engages with Local "Community Champions"	2	7	4	6	4	7
Ability to Recruit or Develop the Best Possible Program Leader	2	6	3	8	4	6
Total:	**48**	**121**	**76**	**117**	**108**	**128**

Legend
Consultant ranking of estimated effectiveness in achieving category objectives
1 = Very Low Level of Effectiveness
10 = Very High Level of Effectiveness

Our recommended approach proposes the adoption of a "hybrid" of several of the organizational models described in Chapter 5 and addresses several key factors that are specific to the current and future conditions in Cleveland County and the City of Norman.

The preferred organizational option for Cleveland County/The City of Norman merges two organizational models:

- The Professional Services/Out-Sourced Management Model
- The Parking District/Commission Model

Community Specific Factors Supporting this Approach

The "justification" for the recommended organizational option is summarized in the community specific factors listed below:

- The size of the community
  - The City of Norman and Cleveland County are still relatively small, but are poised for growth in the coming decade. This organizational option provides the required expertise while keeping the program size small, but scalable over time.
- The fact that parking management will essentially be a new operational function and that there is a lack of existing expertise to manage this discipline.
  - Providing the right level of expertise to ensure a successful new program launch is critical. Providing the required program expertise will also improve the likelihood of enhanced program revenues and efficient operations, improving the potential of enhanced program profitability and sustainability over time.
- The desire for improved coordination and collaboration between the City and County and the need for an efficient and effective operational structure.
  - Parking is important because of the impact it can have on a wide range of broader community planning and economic development initiatives. However, given the size of the community, having two separate parking programs makes little sense. Therefore, with the planned expansion of the community's parking program (driven largely by the County's parking garage investment as part of the "Cleveland County Complex Master Plan") and the potential for the City to expand it's current on-street parking meter program, a jointly managed parking program would serve all party's interests.
- The desire to promote the new downtown master plan and County Complex Master Plan.
  - A national trend that is both very practical and exciting is that of integrating parking and access management strategies into larger community planning processes related to downtown master planning. Including parking professionals in these larger community planning and development processes can have positive and far reaching impacts including mitigating parking as a barrier to potential development by providing proactive parking management strategies and expertise.
- The desire to improve coordination and communications with the University of Oklahoma on parking and transportation issues.
  - Improving communications with and the involvement of a major community partner, such as OU, has many potential benefits, not the least of which is tapping into the parking and transportation expertise of the University. It is entirely possible that the community at large may find themselves in a position in the future whereby shared parking arrangements could be beneficial to both parties. The potential for jointly developed parking resources is another level of potential partnership and cost sharing down the road.

Organizational Recommendation Rationale

This approach is seen as the best option for Cleveland County and the City of Norman for the following reasons:

- Recommended Organizational Model Justification
    a. The key to creating a new parking program in Norman/Cleveland County, from our perspective, is to invest in a highly qualified parking professional and allow them to develop the program based upon the extensive guidance and resources provided within this study.
    b. The Professional Services model envisions a small, lean staff that could be housed in either the County or the City or could be a jointly funded position reporting to a quasi-independent Commission. Part of this recommendation is in recognition that the overall program will be relatively small, reflecting the size of the community and the relative program budget. This option begins small from a staffing perspective, but is scalable over time if needed.
    c. It is envisioned that the funding of this position would be split between the City and the County. Both parties should have their respective human resources staff review the draft "parking administrator position description" provided as Appendix 13 and the "New Parking Manager Integration Action Plan" provided as Appendix 14 and submit a draft recommended position description (including recommended salary and benefits) to the Parking Commission for review and approval.
        i. Initially a program manager, with a limited support staff or even shared support staff is envisioned. Depending on how quickly new program initiatives advance (for example if new technology acquisition and deployment are pursued) a "special projects" coordinator may be needed (or this function could be evaluated as part of the recommended private parking management contract discussed below).
        ii. The program manager position should have strong planning, program development and communications abilities. The manager needs to be able to generate trust and confidence from the community and with the County Commission and City Council/City Administration.
        iii. The primary responsibility of the program manager initially will be program and policy development and assuming the hiring of a private parking management firm (at least initially), he/she will provide contract management and administrative services.
            1. The program manager's initial focus would include such items as:
                a. Coordinating with other County/City departments and functions
                b. Recommending/refining parking rates/fines and other policies
                c. Developing and approving program operational revenue and expense as well as capital budgets
                d. Implementing directives from and reporting to the parking commission board
                e. Developing an RFP to hire a private parking management firm

f. Working with the private parking management firm to develop standard operating polices/procedures in a variety of areas (see Appendix 1 – "20 Characteristics of Effective Parking Management Programs" which essentially represents our recommended parking management program framework)

- Initial outsourcing of day-to-day management
  a. The outsourced management component recognizes that no significant parking management expertise currently exists within either the County or City. Engaging a private parking management firm (at least for an initial three-year term) will provide the following benefits:
     i. Helps ensure that the program gets successfully launched and established
     ii. Provides a base of parking management experience and competence
     iii. Provides the County/City with a built-in "advisory function" during the early years (all the major private parking management firms will pitch this as a benefit)
     iv. Provides established business practices, tools, forms, policies, procedures, etc. In essence the private parking management firm can help get all the program operational basics in place more quickly and efficiently than can be done by creating a program from scratch with only limited internal resources
     v. The private parking management firm will provide a robust set of system reporting options, including detailed revenue and expense reports, program budgets, maintenance programs, etc.
  b. After the initial three-year term of the private parking management firm, an assessment should be conducted to determine whether the firm has delivered enough value for the parking management fee to be continued or whether the program could be managed exclusively with in-house staff.
- Creation of a Parking Commission
  a. The recommended parking manager will be guided and supported by the Parking Commission. The Commission will oversee and supervise the parking manager position in terms of annual performance reviews, salary adjustments, etc. Monthly or bi-monthly Parking Commission meetings are highly recommended.
  b. The Parking Commission model envisions a governing board made up of five individuals representing different aspects of the community:
     i. Two County representatives
     ii. Two City staff representatives
     iii. One ad-hoc community representative
- Parking program revenues as a separate fund
  a. All parking revenue streams should be consolidated to support parking as a dedicated fund. Over time, parking has the potential to be self-funding. This recommendation lays the foundation for this possibility. Appendix 17 maps out a high level financial reporting model appropriate for Board level review at periodic board meetings to review program development and management progress.

- Creation of a Parking Advisory Council
    a. This organizational recommendation also envisions some form of "Parking Advisory Council" to provide a mechanism for ensuring on-going community outreach, engagement and input.
    b. The envisioned Parking Advisory Council should attempt to recruit a range of community leaders who are both invested in downtown Norman/Cleveland County and have strong business backgrounds to provide sound direction and guidance.
    c. Developing some level of authority to affect or at least recommend policy decisions is important to ensure that high quality board members see their role as having value and that they are not merely "ceremonial'.
        i. A framework should be developed whereby certain "policy-level decisions" are defined as the responsibility of the Parking Commission Board and more operational level decisions are ceded to the Parking Advisory Council and/or parking manager. If there are certain policy decisions that the City Council or County Commission decide should be made only by elected officials, these policy areas should be defined up front.
    d. Monthly or bi-monthly Parking Commission Board meetings are highly recommended, especially in the first three years.
- Leverage Parking's potential to be a component of community economic development
    a. The parking commission board and parking manager should actively attempt to leverage parking's potential to support community and economic development strategic goals. To this end the new parking manager should be included in City and County planning meetings related to community master planning and economic development.
- Program Growth and Evolution
    a. To achieve a more fully integrated parking program, it is envisioned that additional functions will be added over about a five-year period. These additional functions should include:
        i. A more robust parking planning function (working with County/City Planning on parking and related transportation issues). There are a number of parking specific planning tools that will be recommended. Parking should also be at the table when issues related to zoning code changes and parking requirements are debated and amended.
        ii. Better integration and collaboration with downtown management and economic development programs. One of the lessons learned from other parking commission models is the extent to which parking can become a true community partner in terms of downtown revitalization and development efforts. Collaborative program initiatives and participation on boards and committees and generally closer working relationships can generate significant community wide benefits to all parties.
        iii. A specific focus on developing programs related to transportation demand management, transportation alternatives and other sustainable transportation program options should be developed over time. In the

long-term, the parking program should evolve to adopt a more comprehensive and balanced mobility management function.

Internal Parking Program – Roles and Responsibilities

The County/City parking program should have complete responsibility for the management of all parking related program elements, including the following program components:

- **Off-Street Parking Facility Management –** This includes day-to-day operations of parking facilities (both garage and surface lots) as well as maintenance, management, marketing, and security of facilities.
- **On-Street Parking Resource Management –** This component includes active management of unmetered and metered on-street spaces within the downtown core, which could include commercial districts and transit station areas. Management of unmetered on-street parking in neighborhood areas would be a secondary priority until such time as residential parking permit programs are implemented or expanded.
- **Collaborative Management of Private Assets –** This includes working with private sector property and business owners, as well as developers, to define shared or leased parking management agreements, or development plans for public-private partnerships related to parking facility construction. Additional program revenues could potentially be generated by having the County/City parking program manage private parking assets on a shared revenue basis.
- **Parking Enforcement –** Parking enforcement is a critical and sensitive parking program function and includes on-street and off-street parking enforcement, management of citations, collection of violations revenue, etc. Adjudication of parking citations should be a function separated from the department that issues the citations.
- **Parking Planning and Policy Development –** This includes developing plans and policies to support the parking program, as well as coordinating with area stakeholders such as businesses, churches, medical campuses, local universities and colleges, residents, regional transportation districts and local/state transit agencies. On-going coordination and collaboration with County/City planning departments is also an expectation.
- **Special Event and Downtown Management Coordination –** This includes developing plans and coordinating parking management policies and procedures related to special events. A close working relationship between Norman Downtowners Association, the Norman Convention and Visitors Bureau, local event venues, the library and other private sector groups that host large events will be required. Norman Police and the City Public Works Department should also be part of this process.
- **Technology Acquisition and Management –** This includes the planning, acquisition, management, and maintenance of parking management, revenue control systems, communications, and associated technologies to help manage and support a data-driven program operation. Developing a comprehensive web-based parking management system that can grow and evolve with the program is highly recommended. Coordination

with City/County IT departments as it relates to technology acquisition and implementation is recommended.

- **Operations and Maintenance –** Operations and maintenance includes the overall day-to-day operation of the program's assets and the ongoing routine, preventive, and reactive maintenance needs of the program assets. Initially outsourcing of day-to day operations to a private parking management firm is recommended as discussed above.
- **Finance and Budgeting –** This includes developing, adapting, and managing annual program budgets, as well as capital acquisition and ongoing maintenance and management costs. Developing maintenance reserves and parking repair and replacement reserve funds should be a long-term priority. As stated earlier, it is recommended that the parking department will be established as a separate fund.
- **Mobility/Transportation Alternative Programs –** A longer term goal of the program will be to evolve programs that will include the introduction and management of mobility improvements intended to enhance the transportation system and support an efficient parking and mobility program. This is not an initial program priority, but it is an important philosophical concept that should not be overlooked.

Organizational Implementation Plan

Regarding the "How to" aspects of creating this recommended parking program organizational structure there are multiple elements recommended including:

- Agree to the program's ultimate organizational framework
- Create a parking commission
- Craft a Cleveland County/City of Norman specific parking manager position description (key responsibilities and focus areas defined, sample position description/salary ranges/recruitment brochure example and other examples provided)
- Hire a parking manager
- Hire a private parking management firm for at least an initial 3-year term (parking manager priority)
- Create basic operational tools, manuals, procedures, forms, etc. (parking manager and parking management firm roles and tasks), as well as managing day-to-day operations and implementing policies drafted by the parking manager and approved by the parking commission
- Create an Advisory Board to provide a mechanism for community input and act as a sounding board for recommended policy decisions and general feedback on the new services provided
- Establish parking as a separate fund

These recommendations form the basic work plan for "getting the program up and running". However, as with any new program, there will be specific issues that will need to be prioritized. Determining these priorities should be the responsibility of the new parking manager and parking commission. A few examples specific to Cleveland County/City of Norman might be:

- Creating an initial program budget (A preliminary program budget outline is provided in appendix 40. Note: this document includes some preliminary assumptions related to parking rates and other basic budget elements)
- Planning for the opening of the new County parking garage (A parking garage start-up plan is provided in appendix 39).
- Determining an equitable parking revenue and asset ownership model that works for both the County and the City.

Risk and Rewards

The primary risk for both the City and the County revolves around the investment in a parking manager FTE and the engagement of a private parking management firm (the estimated costs for both are approximately $250K per year). However, once a new parking manager and parking management firm are in place, opportunities to increase parking revenues will be enhanced and will likely mitigate the investment risk.

It should be noted that parking garages tend not to pay for themselves. It generally takes somewhere between $150 – $250 per space per month to pay for operations, maintenance, maintenance reserves and debt service depending on land and project costs. It is highly unlikely that these rates will be feasible in Norman. However, surface lots, on-street meters and enforcement should all be able to be profit generators, if well managed. The garage may be able to cover operating and maintenance costs, but not debt service or maintenance reserves initially. By consolidating all revenue streams into a single fund the financial performance of the program

will be enhanced and ultimately could begin setting aside monies for future capital investments such as new equipment, new surface lots or even a second parking structure.

The draft Parking Program Preliminary Budget outline (Appendix 40) makes many assumptions regarding potential program revenues and expenses. It estimates a net revenue of approximately $257,543.00 and projected expenses of $395,329.00 for a year one net operating result of (-137,786.00).

Appendix 41 provides a parking meter upgrade and preliminary meter revenue projection model. This model is very flexible and all the variables can be adjusted to run different scenarios. The current model assumes new credit-card enabled single space meters to cover 200 additional spaces. This would generate approximately $275,000.00 per year in new parking revenue. The initial capital investment estimated at $170,000.00 would be paid off with the first year's meter revenue leaving a first-year revenue number of approximately $105,400.00. Subsequent annual revenues should be in the $275,000.00 range. If this investment were made, the program would be profitable in the second or third year, significantly reducing the potential financial risks to both parties.

One element not specifically addressed in the report is the **"ownership of physical parking assets"**. While we recommend that all parking related revenues be placed in dedicated fund (because this is best way to work toward a potentially self-funding parking program over time), it is assumed that both the City and County would retain ownership of their individual assets (for the City this would include on-street parking and surface lots and for the County it would be the new parking garage and any other parking assets).

In summary…

One of the most important actions that needs to be undertaken is the authorization of a parking manager position and the recruitment/hiring of a parking manager. We highly recommend that the County/City recruit and hire a high caliber individual that has both parking and transportation management experience and also excellent communications skills, the vision to guide program development and someone who can work well in a team environment.

Parking is more complex and inter-related than many other functions. Parking can also be very controversial and needs a manager that can generate confidence and trust while also being politically sensitive and astute. As the department evolves into a more robust, mature program with an expanded scope of services, it is recommended that the parking manager position be reviewed with an eye toward the development of a "Parking Director" or "Parking Administrator" level position. An extensive document has been provided in Appendix 3 which provides an overview of parking administrator positions from around the country including salary information, examples of program scopes and several example position descriptions.

As the department expands its scope and matures, new potential areas of staff development and recruitment might include "accounting and auditing", "planning and community education" and "special projects".

Program Development Framework

Our recommended approach to parking program development is outlined in Chapters 6 and 7 of this report.

- Chapter 6 "Recommended Parking Management Program Framework" provides draft program mission and vision statements as well as a detailed set of program "guiding principles".
- Chapter 7 "Recommended Parking Program Implementation Plan / Action Items" introduces our parking management framework/approach that we call the "20 Characteristics of Effective Parking Programs".

Together these two chapters provide a comprehensive and strategic approach to parking program development and management. The full "20 Characteristics of Effective Parking Programs" document can be found in Appendix 1.

The 20 Characteristics include all the elements in the list to the right. A parking system that has all 20 of these characteristics is well on its way to being in a class apart from the majority of parking systems. The ultimate goals are a system that provides professional management, understands the role it plays in contributing to the larger objectives of the downtown and the County and is responsive to the community to which it serves.

Another significant project deliverable can be found in Appendix 11 "Parking Management and Design Best Practices". This collection of parking management and design best practices has been compiled over a number of years and continues to evolve as the parking industry evolves. Our goals in the development and organization of this document were to provide a comprehensive categorization of parking planning, management and design areas to make finding specific best practices easier.

Implementation Plan and Primary Action Items

Chapter 7 also includes our recommended primary action items. This section is essentially the report's prioritized Implementation plan. Below is a summary listing of these key recommendations:

Primary Action Item #1: Adopt new program vision and mission statements and recommended parking program guiding principles. Adopt the preferred parking management organizational framework. Hire a parking management professional and begin prioritizing and implementing parking management best practices.

Primary Action Item #2: Engage a private parking management firm and develop operational policies and procedures. Begin a process to evaluate investment in new on-street and off-street parking technology.

Primary Action Item #3: Leverage parking as a community and economic development strategy and develop a comprehensive parking planning function.

Primary Action Item #4: Develop a proactive facility maintenance program including regular facility condition appraisals, prioritized facility rehabilitation plans and the creation of parking facility maintenance reserves

Primary Action Item #5: Develop a new parking program brand and marketing program including significant on-going community outreach strategies.

Primary Action Item #6: Invest in training and staff development with a goal of mastering the fundamentals of parking system management and operations

Primary Action Item #7: Develop a detailed facility opening / operational plan for the planned County garage.

Primary Action Item #8: Critically assess the current parking enforcement program using the tools provided. Invest in mobile license plate recognition technology.

Primary Action Item #9: Establish the parking program as a separate fund and combine all parking related revenue streams into this fund.

Primary Action Item #10: Expand the scope of the parking program over time to be more supportive of alternative modes of transportation and embrace more of a "mobility management philosophy".

In Summary

The development of a strategic vision and a strong, well defined action plan is a critical first step in creating a comprehensive public parking program for Cleveland County and the City of Norman. We applaud the community's recognition of the importance of addressing parking management as an important community development element and for making the investment in this study.

Parking can be a significant partner and contributor to advancing the community's economic development goals as well helping to improve the overall experience of accessing Norman's core neighborhoods and downtown business district. We are confident with the strong team of County and City leaders, an engaged and supportive Mayor, City Council and Board of Commissioners, strong downtown organizations and new investments in parking program development that the future of downtown Norman and Cleveland County is bright indeed. Now the real work on parking program improvement begins!

2. Planning Context

At project inception, Kimley-Horn provided the County and City with an extensive "Request for Information" or RFI. The following summarizes the documents received. The 48 separate documents provided have been organized into the following seven categories:

1. Active Transportation (Bikes/Peds)
2. County/City Codes and Policies
3. County/City Parking Information
4. Downtown Revitalization
5. Planning
6. Previous Parking Studies
7. Transportation Planning

Below is a listing of the RFI documents by category:

Note: CN = provided by City of Norman and CC = Provided by Cleveland County

Category One – Active Transportation

- Bike and Pedestrian Master Plan – Bike and Ped Map (CN)
- Sidewalk Completion Plan Map (CN)

Category Two – County/City Codes and Policies

- City of Norman - Municipal Code - Chapter 20 (CN)
- Center City Form-Based Code Norman, Oklahoma, September 2016 (CN)
- Practice 34.1 Parking Facility Planning (CN)
- Practice 34.2 Parking Facility Design (CN)
- Practice 34.3 Parking Facility Maintenance (CN)
- Practice 34.4 Parking Facility Operations (CN)
- Practice 34.6 On-Street Parking Meters (CN)
- Practice 34.7 Parking Regulation (CN)
- Practice 34.8 Angle Parking (CN)
- Practice 34.9 Access to Parking on Streets (CN)
- Practice 34.5 Parking Fees (CN)

Category Three – County/City Parking Information

- Downtown Parking Lot - Revised (August 2016) Management Business Plan (CN)
- Downtown Parking Lot Management System (CN)
- Parking Meter Transaction Log (CN)
- Municipal Parking Lot Lease Agreement (CN)
- Norman, OK TPAL Pay-By-Space Meter Screen Display (CN)
- Norman Police Department Website – Parking Enforcement Page (CN)
- Whoosh Pay-by-Cell Phone Sticker (CN)
- Traffic Control Division Organizational Chart (CN)

Category Four – Downtown Revitalization

- Downtown Norman Revitalization Plan September 1999 (CN)
- Downtown Rev Plan Summary Sheet 1 of 2 (CN)
- Downtown Rev Plan Summary Sheet 2 of 2 (CN)

Category Five – Planning

- NORMAN 2025 Land Use and Transportation Plan12_04 (CN)
- Norman Main & Gray Final Report (CN)
- Porter Corridor Final ZOD Ord with Exhibit A (CN)
- Porter Public Streetscape Concept Document 06.04.10 (CN)
- Cleveland County Complex Final Master Plan (September 2017) (CC)

Category Six – Previous Parking Studies

- 2016-04-28_2016 Norman Parking Study (CN)
- 2016-04-28_County Parking Letter Report (CN)
- Revised Campus Corner Parking (Sept 2015) - Management Business Plan (CN)
- 2015 Draft Jacobs Letter Report (CC)
- City Handout and Jacobs Presentation 7-19-16 (CC)
- Draft Study Figures 1 3 and 4 2-16-16 (CC)
- Draft Study Review Agenda and Recommendations 2-16-16 (CC)
- Jacobs Parking Study Report Summary PPT 5-16-16 (CC)
- Norman Parking Study Update Presentation 10-29-15 (CC)
- Updated Jacobs Draft Letter Report 2-23-2016 (CC)

Category Seven – Transportation Planning

- ACOG - Encompass 2035 Plan Report (CN)
- ACOG - Encompass 2040 Regional Plan (CN)
- Encompass 2035 – Brochure (CN)
- Encompass 2035 - Plan Map (CN)
- MP-CTP Transportation Thoroughfare Plan Map (CN)
- MP-Transit New Concept Routes Map (CN)
- Norman Comprehensive Transportation Plan (CTP) Final Report w-o Appendices 5-13-14 (CN)
- Norman CTP Final Report Appendices 5-13-14 (CN)

Planning Report Review Summaries

As part of our parking strategic plan assessment, it is important to document the larger planning context in which this study is being undertaken. The following section provides a brief summary of some of the primary planning documents that we have reviewed to date. Of special interest is the 2016 Norman Parking Study conducted by Jacobs Engineering Group. A more detailed review of this recent plan is provided in the following section.

1999 Downtown Norman Revitalization Plan

Goals outlined in the Downtown Norman Revitalization Plan include encouragement of mixed use development with both daytime and evening activities to facilitate promotion of shared parking and captive parking environments that efficiently accommodate multi-destination trips. Additionally, the plan recommends provision of 795 net new parking spaces to accommodate planned growth in retail, residential, office and other land uses. Of these, 194 spaces are proposed for private use, with 601 spaces designated for public use and including a 360-space parking garage at the site of current surface parking at Jones Avenue and Symmes Street.

2014 City of Norman Comprehensive Transportation Plan

As part of the Comprehensive Transportation Plan, the Transit subcommittee identified three concerns regarding local transit:

1. Limited Saturday and evening transit service
2. Absence of night and Sunday service
3. Overall need for increased frequency of transit services

Additionally, a lack of public parking supply in the Campus Corner area was noted. The subcommittee notes that while there exists an adequate supply of private parking, current signage and privately enforced regulation of those spaces necessitates moving the vehicle if visiting multiple destinations, even within close proximity. Provision of more public or shared parking would reduce traffic congestion and promote a pedestrian oriented environment.

2015 Campus Corner Parking Management Business Plan

The business plan, pulling from existing meter transaction data, identifies peak parking demand occurring between noon and 1pm on a typical weekday, but notes that localized areas experience high parking demand throughout the week and into the weekend. This report observed parking spillover from the university campus in the surrounding neighborhood. Recommendations in the plan include the development of a multilevel parking garage north of Boyd House where an existing, access controlled surface parking exists, along with an on-street rate increase from $0.25 per hour to $1.00 per hour for metered spaces where meters already exist on-street.

2016 Downtown Parking Lot Management Business Plan

The 2016 Downtown Parking Lot Management Business Plan specifically addresses the operation of the surface parking lot at Gray Street between Peters Avenue and Crawford Avenue that opened in early 2007. The lot originally included 104 parking spaces, 6 of which are designated for drivers with disabled placards and 41 parking spaces are designated for permitted parkers. Permits are issued on an annual basis at a rate of $450 per year. Applications are submitted early each

calendar year for inclusion in a lottery for issuance, as well as position placement on the wait list. Permits do not renew annually. Rather, permits are returned and parking patrons reenter the lottery each year.

In 2012, the lot was expanded to add 40 additional spaces and Parkeon Multi-space parking meters were installed at this time. The off-street metered spaces are charged at a rate of $0.25 per hour. Rates are not proposed for increase in the plan, nor are additional multi-space meter locations proposed.

Organizationally, parking management currently resides within the Traffic Control Division, under the Operations section.

2016 Norman Parking Study (Jacobs Study)

The parking study completed in 2016 suggests that the parking issues experienced within the study area cannot be resolved solely through management of parking resources by the City, but rather requires cooperation among business owners, the University of Oklahoma, Cleveland County, and other institutional leaders in the community. For instance, although the overall study area experiences a peak occupancy of approximately 43% during regular business hours, the study identifies specific areas of localized parking supply shortage and excessive occupancies, including in the immediate area of the County Courthouse and Administration Building.

We did not find any major objections to the report documentation or methodology, although the report did rely heavily on the 5% and 10% background growth assumptions to justify the recommended County garage (given the overall low rates of current utilization and lack of identified future development projects).

Kimley-Horn sees the proposed County garage as a positive development initiative, especially in the context of the larger County Complex Master Plan. This investment is consistent with our white paper entitled "Parking as an Economic Development Strategy" (Appendix 32) which illustrates that parking development leading other development can be a successful strategy.

Please see the more detailed review of this plan in Appendix 44 – "2016 Jacobs Parking Study Summary".

2017 Cleveland County Complex Final Master Plan

The Cleveland County Complex Final Master Plan, published in September 2017, identifies the location for a new parking structure to be constructed serving the courthouse and other nearby uses. The parking structure is advised to include, among other considerations, ground level activation and reserved, secure parking for dignitaries working in and visiting the courthouse. The Preferred Garage Concept included in this documents provides for a total of 390 parking spaces, of which 370 are available for public use and the remaining 20 are reserved for the aforementioned dignitaries. The concept design also provides for an additional 22,200 gross square feet of commercial space for retail, office, or other use. The plan also notes a lack of multifamily development, although a strong demand exists among young professionals and empty nesters. Challenges to be addressed in meeting this housing demand, as well as retail, is as the report describes, "challenging configurations of space in historic buildings." There are additional noted challenges with property owners intentionally opting to allow properties to sit vacant. The plan recommends development occurring in the area of the courthouse support the concept of

"healthy living" that promotes walkability through mixed use development including such uses as multifamily residential and retail, as well as a shared parking facility for the courthouse and these additional uses.

Norman 2025 Land Use and Transportation Plan

Much like the Downtown Revitalization Plan, the 2025 Land Use and Transportation Plan promotes the development of vertically mixed use developments featuring, among other elements, pedestrian oriented site design and interconnected network or multi-model streets to reduce single occupancy vehicles miles and demand for parking.

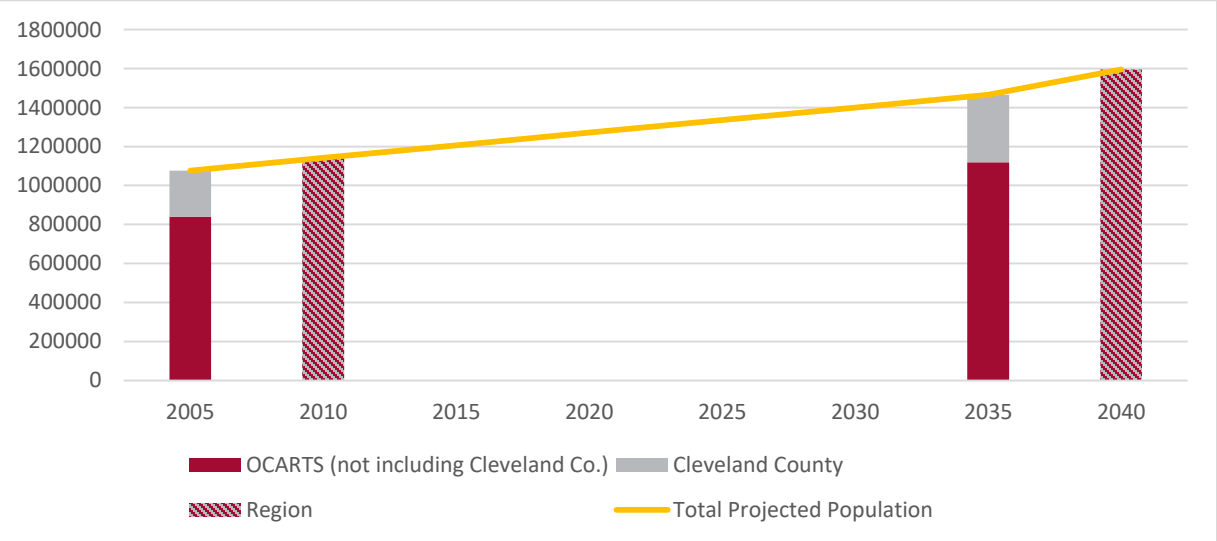
Encompass 2035 and 2040: Oklahoma City Area Regional Transportation Studies (OCARTS)

The Encompass reports provide projections on growth for the central Oklahoma region as well as multi-modal analysis and recommendations for networks currently or potentially connecting to Oklahoma City. **Table 2.1** provides a comparison of projected growth rates for overall population and employment for Cleveland County versus the region. **Figure 2.1** provides the same projections in graph form.

Table 2.1 Oklahoma City Area Regional Growth Projections

	2005	2010	2035	2040
Population				
Cleveland County	237,052		345,335	
OCARTS	1,076,258	1,142, 338	1,464,814	1,595,168
Employment				
Cleveland County	86,026		156,888	
OCARTS	578,306	601,839	801,302	875,402

Figure 2.1 Oklahoma City Area Regional Growth Projections



In line with the Downtown Revitalization Plan and 2025 Land Use and Transportation Plan, the recommendations from the Encompass plans include, among other initiatives:

- Promote economic vitality through enhanced mobility, specifically encouragement of mixed use development within the core.
- Minimize environmental impacts associated with transportation through promotion of alternative modes of transportation and development patterns that reduce travel distance for common destinations.
- Enhancement of transportation choices for the movement of people and goods, including expanding the region's transit service and bicycle networks, and exploration of rail-based public transportation and other fixed guideway technologies
- Increase the efficiency and reliability of the transportation system.
- Development of a Regional Transit Authority that would include committees throughout the central Oklahoma/Oklahoma City municipal service area.

Porter Avenue Corridor Study Phase II, Public Streetscape Concept Design Document

Once a transportation plan is implemented by the City, an access management plan is needed to address several areas of critical access concern along Porter Avenue. Markedly, the area generally south of Acres Street to Alameda Street. While this corridor does not currently include on-street parking, several of the recommended improvement sections include reducing traffic lanes from four lanes to two and providing 90-degree on-street parking. This would include traffic calming elements such as the installation of a roundabout, landscaping, and bulb outs, among other elements.

Main and Gray Streets Conversion

Recommended cross sections for Main Street and Gray Street show the conversion of these one-way streets to two way streets to calm traffic along these roadways between University Boulevard and Porter Avenue. Specific recommendations include converting to one lane of travel in each direction with a center turn lane, maintaining the existing crosswalk bulb-outs and angled parking along the curb lane, restriping the westbound lane to reflect the change in direction of travel. However, the City of Norman reports that the traffic analyses included in the original study could not support the road diet, particularly in the area south of Main Street.

Norman Center City Form-Based Code

Much like the previously mentioned planning documents, the Center City Form-Based Code promotes use of shared parking and use of alternative modes of transportation, including walking and biking, while reducing single-purpose parking. To facilitate the use of shared parking, C-3 zoned parcels are exempt from parking minimum requirements. For additional information about reduced parking requirements, refer to Center City Form-Based Code as adopted by the City of Norman.

Other Documentation

City of Norman Parking Zoning and Policy Compliance Reports

Reviewed by Public Works and confirmed by the City's Accreditation Manager, the City of Norman is in full compliance with all included, as listed below as of October 2014:

- 34.2 Parking Facility Design
- 34.3 Parking Facility Maintenance
- 34.4 Parking Facility Operations
- 34.5 Parking Fees
- 34.6 On-Street Parking Meters
- 34.7 Parking Regulation
- 34.8 Angle Parking
- 34.9 Access and Parking on Streets

Downtown Parking Lot Management Business Plan

City of Norman, Department of Public Works, Traffic Control Division
Revised: January 1, 2016

Zoning Ordinances and Design Standards

Chapter 20 of the City of Norman City Ordinance provides traffic and parking regulations.

Section 429.6 PCZOD, Porter Corridor Zoning Overlay District creates a buffer between the commercial and residential areas. This overlay district is intended to protect both commercial and residential land uses while encouraging economic development in the district.

3. Existing Conditions Review

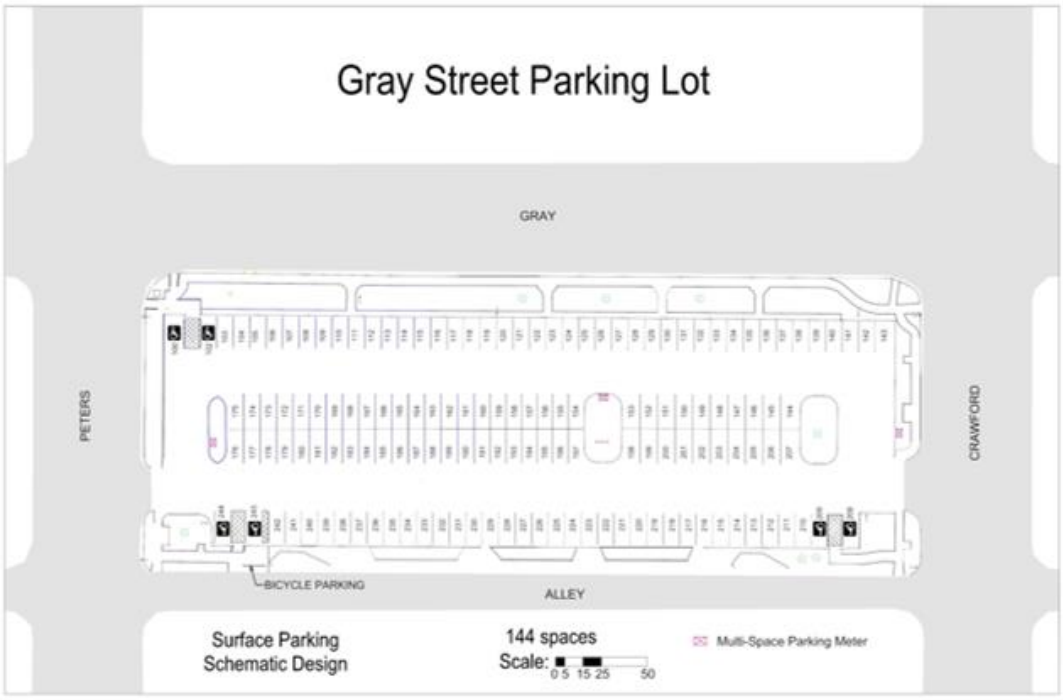
Current Parking Program Review

Much of the following information on the current City of Norman parking program reflects information contained in the document entitled: "Downtown Parking Lot Management Business Plan" developed by the City of Norman, Department of Public Works, Traffic Control Division (Revised: January 1, 2016).

Introduction

Norman's historic downtown functions as the commercial center of the community - the "Heart of Norman" - including government, financial institutions, law firms, churches, and many retail and restaurant establishments.

The decline in retail activity of the 1970's and 80's began to be reversed in the new millennium and has resulted, once again, in a vibrant downtown that is both a local and regional attraction. This vibrancy and renewed interest in the area created a parking demand that could not be met with the existing public parking supply. To address this shortfall, the Norman City Council commissioned a Parking Study to measure both existing and future parking demand, and to develop recommendations for efficient parking management in the area. The study, which was conducted by the firm of Carter - Burgess, recommended the construction of a new pay-by-the-hour parking lot and identified the most suitable location to be along the south side of Gray Street, between Peters Avenue and Crawford Avenue.



Construction of the lot was completed in two phases. Phase 1 began in the fall of 2006 and was completed on January 30, 2007. It provided 104 spaces to the general public at no cost to the user. It did not take long for the lot to operate at or near capacity, reaching 80% occupancy sixty days after the opening and nearly 100% twelve months later. More than 50% of the users were long-term parkers who worked in the Downtown area.

Phase 2 construction began in the summer of 2012 and was completed in November of the same year. Phase 2 added 40 more spaces and increased the total capacity of the lot to 144 spaces.

In order to provide adequate and convenient parking for both Downtown employees and customers, the Downtown Merchant Association requested that the City of Norman implement a parking management system that requires customers to pay for the use of the lot. The specific recommendations made by the association serve as the backbone of this Business Plan.

This business plan details the strategies and payment options available to customers, employers, employees and visitors who park on the Gray Street Parking Lot which is owned and maintained by the City of Norman.

The plan is designed to maximize both the level of convenience experienced by all users as well as the efficient use of the lot.

Parking Management System

The Gray Street parking lot is managed to accommodate a wide range of users visiting, working or doing business in Downtown Norman. Different payment options are offered to meet the specific needs of individuals. For the short-term user visiting Downtown, there are three conveniently located multi-space parking meters that can be used to pay for one or multiple hours of parking. For the long-term daily user, there are permits available for lease annually. For individuals with disabilities, there are a number of accessible parking spaces reserved for their use at no cost.

Multi-Space Parking Meter

The city purchased a parking management system from New Jersey - based Parkeon using a no-interest loan from the Norman Downtowners Association and Republic Bank that will be paid back by the City of Norman using part of the revenues collected by system. The system includes three multi-space parking meter stations. The system can tell Parking Enforcement Officers which spaces have been paid and which are either expired or not paid.

The meters are digital, ticketless multi-space meters. The hardware solution for pay-by-space parking operations, supports pay-at-any-space, credit/debit card, pay-by-cell, and coin transactions. The units are PCI compliant and feature a secure intelligent cash box system, ensuring revenue and data security. The current system was implemented such that the multi-space parking meter stations became operational in August of 2015.

Signing

The location of each parking meter station is signed for easy recognition.

Operation

- The multi-space meter unit will operate with solar panels to allow solar charging regardless of meter location relative to the sun
- The display allows payment prompts guiding the user through the payment process
- The display and keypad support a dedicated information key and screen for on-screen help and instructions
- The display backlight and contrast automatically adjust to ambient light and temperature conditions
- The coin entry slot accepts all US coins
- The unit does not accept bills
- The unit will accept Visa and MasterCard
- The meter supports real-time credit card processing, with authentication within 15 seconds in most situations
- Display messages are customizable

Payment Options

The Multi-Space Parking Meter Stations in the Gray Street Downtown Parking Lot accept the following as a means of payment:

- Coins
- Credit / Debit Cards
- The system also has the capability to accept pay-by-cell phone payments (Whoosh!)
- Validation Codes

Single Space Meters

Hourly parking can be purchased using coins. The meters accept nickels, dimes, quarters, and dollar coins. Customers can purchase multiple hours of parking at a rate of 25¢ per hour.

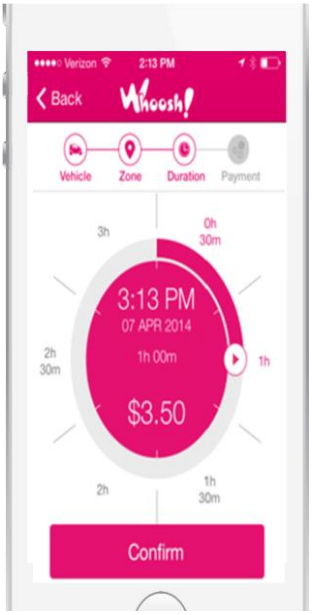
Credit / Debit Cards

The meters accept Visa or MasterCard for hourly purchase transactions and support real-time credit card processing, with authentication within 15 seconds in most situations. There is a minimum credit card charge for parking in order to accommodate all of the various credit card transaction fees paid by the City of Norman on each transaction. Minimum credit card charge is 75¢ (or 3 hours).

Pay-By-Cell Phone

One of the more convenient features of the new system offers customers the option to pay for the use of the lot by cell phone using Whoosh!. Any customer may take advantage of this payment option offering the features shown below:

- The Whoosh! mobile phone app can be downloaded from the App Store onto an iPhone or the Google Play Store onto an Android device
- Users register their license plates and credit card with the Whoosh! system through the app or through www.whooshstore.com
- Non-Android or non-iPhone users can access Whoosh! by visiting its mobile web site - m.whooshstore.com
- To pay for parking, you simply open the app or mobile web site on your phone, select your vehicle, choose the closest meter to your vehicle, and choose the amount of time you want to park



Validation Codes

The Parkeon Validation Codes System gives the City the capability to provide validated parking at the pay stations. In this case, those desiring to pay for others parking would visit the City, pay for the specified amount of time, and the City would create a code choosing from many different parameters to help provide a convenient parking experience for its customers.

- City staff have access to the system 24/7/365
- The system is password protected
- Parking staff creates and manages all codes

- Codes can be assigned the following attributes: specific description, usage restriction, and code definition
- Full back end reporting

Benefits of the system include:

- Gives merchants a mechanism for validating customer parking and employers for employees
- Validated parking can be given to attendees of special events
- Can be a significant customer service tool

Permit Parking

For Downtown employers and employees, the City also offers the option of purchasing a twelve-month permit for $450. Customers who prefer this option will be able to park in a designated area of the lot that includes 41 spaces clearly signed for permit holders.

There are 41-spaces available for permit parking (Spaces 103 -143). Permit parking fees are discounted by 25% over the equivalent cost of hourly daily parking. Customers interested in this option must complete a permit parking application. Spaces will be leased to interested Downtown area businesses and employees according to a defined lottery process.

PARKING FEES

Hourly Parking Rates

Day	Hours	Maximum Hours	Cost
Monday - Friday	8:00 am to 5:00 pm	9	25¢ per hour

Permit Annual Rate

Day	Hours	Maximum Hours	Cost
Monday - Friday	8:00 am to 6:00 pm	10	$450 per Year

ANTICIPATED NET REVENUE

Revenues

Revenue from the parking meter system comes from two sources; meter fees and expired meter citations. Using historical data, the revenue is anticipated to be approximately $53,450 per year. The following assumptions are made:

Meter Fees

- Total Number of Parking Spaces = 144
- Spaces Reserved for Disabled Users = 6
- Spaces Reserved for Permit Parking = 26
- Spaces available for the General Public = 97
- Hours of Operation = 8,760 hours per year per space (261 days per year / 5 Days per Week / 9 Hours per Day). Occupancy = 15%
- Projected revenue:
- Permit Parking = $18,450 per year
- Meter Transactions (including Whoosh! and Validation Codes) = $25,000 per year

Meter Citations

- Total Revenue from Meter Citations = $10,000 per year
  (1,000 citations at $10 per citation)

Expenses

The annual cost of operating the new Gray Street parking management system is $11,725 and includes the following items:

- Parking Management (licensing, remote internet access, system hosting, etc.) - $2,000 per year
- Credit Card Transaction Fees - $4,280 per year (40 daily transactions average @ $0.41 per transaction)
- Pay-By-Cell Fees - $3,445 per year (20 daily transactions average @ $0.66 per transaction)
- Regular Meter Maintenance - $2,000 per year

Net Revenue

The projected parking meter revenue minus the expenses associated with operation, maintenance and enforcement of the new system, is expected to generate a net revenue of $41,725.

Enforcement

Parking enforcement falls under the jurisdiction of the Norman Police Department's Operations Bureau, within the Uniformed Support Division.

The department employs four, full-time Parking Enforcement Officers who work Monday through Friday between the hours of 8 a.m. and 5 p.m. and one, part-time Parking Enforcement Officer who works evenings and Saturdays.

The purpose of these civilian employees is to mitigate traffic congestion and promote parking turnover. Parking turnover is created by the consistent enforcement of parking ordinances, resulting in available parking in densely populated parking areas. The Parking Enforcement Officers accomplish this by insuring that appropriate enforcement is carried out vigorously, yet fairly and efficiently.

Parking regulation enforcement includes general enforcement of metered and time zone areas, residential parking, disabled access restrictions, fire and other restricted zones, as well as the removal of abandoned vehicles and vehicles with outstanding citations. The issuance of citations provides an incentive for citizens to comply with regulations, which in turn improves accessibility, increases parking availability and encourages the efficient movement of traffic.

Parking enforcement generates approximately 8,383 citations annually, of which approximately 5,000 are processed through the municipal court each year.[1] The 2016 Norman Parking Study recommended moving the adjudication of parking citations to a Parking Authority, in conjunction with enforcement efficiency improvements including the use of existing license plate recognition (LPR) equipment to enforce time restricted parking facilities.

Parking Meters

The City of Norman has just over 200 parking meters within its system. These meters are located around the Cleveland County complex and the Campus Corner area. By ordinance, parking meters shall be utilized between the hours of 8:00 AM and 6:00 PM excluding Sundays and holidays unless marked otherwise. Parking rates are specified on the parking meter. It is not proper to deposit any coinage into the parking meters other than those issued by the United States. It is also not proper to increase or extend the parking time for any vehicle at any metered space beyond the legal parking time established on the face of the meter.

The Campus Corner meters have been upgraded to accept credit card payments. This upgrade also increased the operation of the meters in the Campus Corner area to the hours of 8:00 AM to 9:00 PM Monday through Saturday. Parking rates in the Campus Corner area were revised to $1.00

[1] "Violations" City of Norman, http://www.normanok.gov/content/violations

per hour. Maximum stay in the Campus Corner area is two hours between 8:00 AM and 6:00 PM and three hours between 6:00 PM and 9:00 PM. The minimum allowable credit card purchase is $0.75.

Parking rates in the Downtown Gray Street parking lot is $0.25 per hour. There are three pay stations located with the Downtown Gray Street parking lot. The locations are at each end and in the center of the lot. Any of the three pay stations may be utilized to buy parking time for any of the available spaces within the lot. The pay stations will allow you to buy time only up to 5:00 PM. For example, if a patron arrives in the lot at 4:00 PM, the pay stations will only let you buy one hour's worth of time to 5:00 PM. If, on the other hand, a patron arrives in the lot at Noon, the pay stations will allow you to buy five hours' worth of time to 5:00 PM. As with the Campus Corner meters, the minimum allowable credit card purchase for time in the Downtown Gray Street parking lot is $0.75.

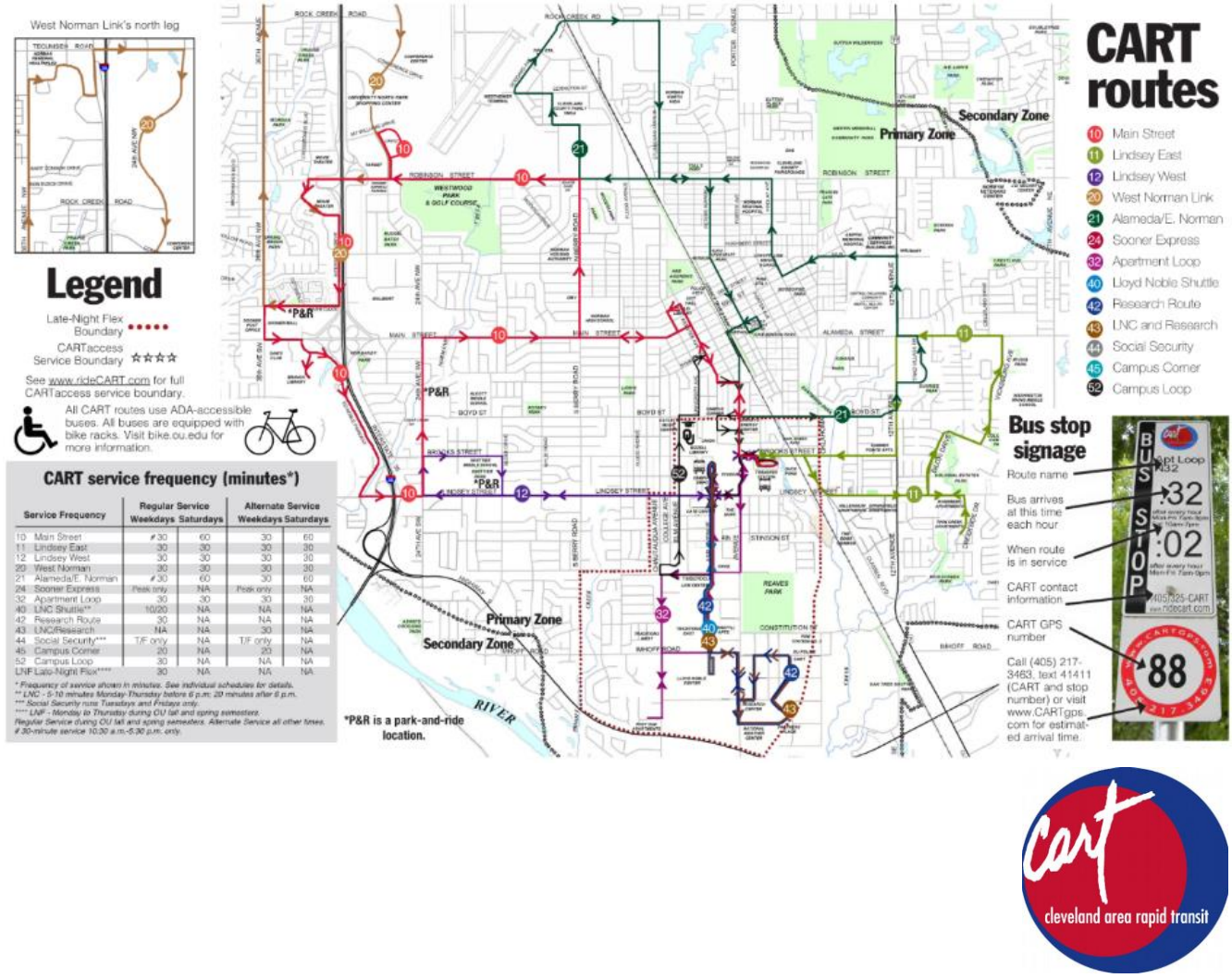
A Pay-By-Cell option, called Whoosh!, is now available for use in the Gray Street parking lot. The Whoosh! mobile phone app can be downloaded from the App Store onto an iPhone or the Google Play Store onto an Android device. Users register their license plates and credit card with the Whoosh! system through the app or through www.whooshstore.com. Whoosh! can be accessed by visiting its mobile website m.whooshstore.com. To pay for parking, you simply open the app or mobile web site on your phone, select your vehicle, choose the closest meter to your vehicle, and choose the amount of time you want to park. When your parking session is about to expire the application can send a reminder via text message. Users can extend their parking session from anywhere. A nominal convenience fee of $.35 is added to each parking transaction to cover Whoosh's transaction fee.

Transit

City Routes

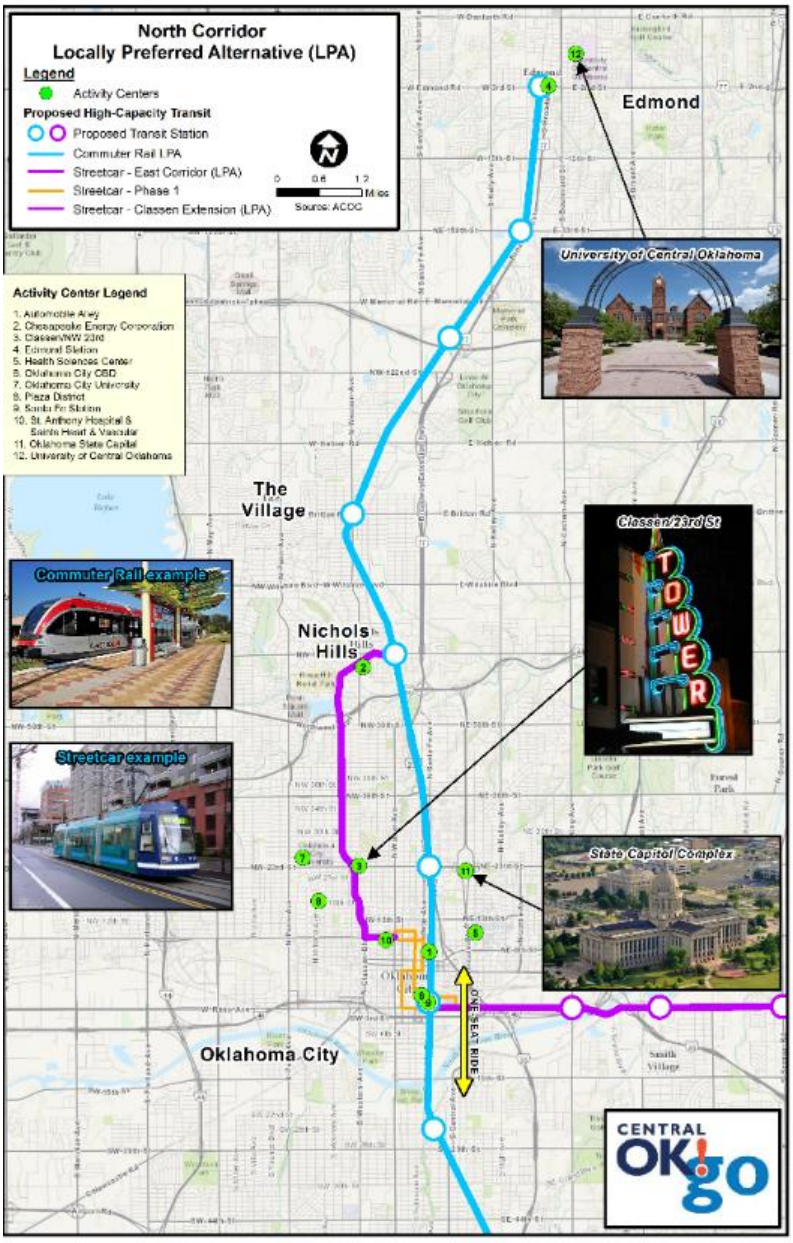
The Cleveland Area Rapid Transit (CART) System is currently operated by the University of Oklahoma. With more than one million riders each year, CART provides service along seven routes with the City of Norman, three OU Campus routes, and a commuter route with service to Oklahoma City. CART also provides paratransit service.

Figure 3.1 Season 1 Bus Routes



Commuter Route

The express commuter route provides service connecting the City of Norman with Oklahoma City, utilizing a route along Interstate 35. However, as noted in the 2014 Norman Comprehensive Transportation Plan, this route is subject to the same traffic congestion that delays many single occupant vehicle commutes through the corridor. The Plan recommends increasing the frequency of service to provide more convenient times to a wider range of potential riders, along with either a realignment of the route or the installation of a high-occupancy vehicle lane on Interstate 35 to reduce delays related to traffic congestions. It was in this same plan that the committee expressed transit concerns in the need to increase the frequency of service along current routes, as well as the limited service available in the evenings and on Saturdays, and lack of service overnight and on Sundays.



Peer City Parking Programs

The following Peer City reviews provide "Case Study Snapshots" of similar sized municipalities. Cleveland County and the City of Norman are just beginning to consider a more comprehensive approach to parking management. The following programs provide a snapshot of how these other communities integrate parking management into their larger community development strategies and provides some sense of their program's size, scope, history and challenges.

Rather than being typical peer cities to Norman, these communities were selected more as "cities we can learn from" as it relates to parking program development. The following cities are profiled:

- Boulder, CO
- Missoula, MT
- Eugene, OR

These cities have been contacted by the project team and have agreed to discuss their parking programs with County/City representatives and provide advice and support.

City of Boulder Parking Services, Boulder, Colorado

- Population 103,840

PROGRAM OVERVIEW

Boulder Parking Services manages the parking garages, on-street systems and enforcement for Boulder's three major commercial areas: downtown Boulder, University Hill and, when completed, Boulder Junction. They also manage 10 Neighborhood Permit programs throughout the City. Their mission is to provide quality program, parking, enforcement, maintenance, and alternative modes services through the highest level of customer service, efficient management and effective problem solving.

QUICK STATS

- 2,700 on-street spaces
- 2,194 spaces in garages
- 1,300 bike parking spaces
- 6,392 EcoPass holders
- On street paid parking via multi-space meters
- Pay-by-phone available
- Free garage parking on weekends
- Enhanced wayfinding through variable messaging signage
- Piloting sensors in garages to indicate space availability
- Installed parking meters in 1946
- 2014 parking revenue: $10,721,689

Boulder Contact Info

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REVENUE FOR 2014 BY SOURCES

- On-street meter – 33%
- Short term garage-hourly – 17%
- Long term garage-permits – 26%
- Parking products – garage/on-street – 6%
- NPP-resident/commuter – 1%
- Enforcement – 16%

DOWNTOWN VITALITY

- Average Commercial Lease (Rent)/Sq. Ft.: $29.01
- Retail Mix:
  - Retail: 60%
  - Restaurants and Bars: 40%
- Retail Sales Mix:
  - Restaurants and Bars: 55%
  - Retail: 45%
- Downtown Vacancy: Very low (<3%)

CHALLENGES & OPPORTUNITIES

- Boulder's parking management and parking district system has a long history, with the first parking meters installed on Pearl Street in 1946. During the past decades, Boulder's parking system has evolved into a nationally recognized, district-based, multi-modal access system that incorporates transit, bicycling and pedestrians, along with automobile parking.
- The City takes an integrated approach to parking management and actively encourages the use of alternative modes of transportation. 56% of people accessing downtown by car, 19% walk, 9% take the bus, 9% bike and 9% use other methods like carpooling.
- Boulder has a sophisticated customer base that is used to shopping in larger cities where on-street paid parking is common, so they don't hear a lot of complaints from customers about paying for parking.
- There is a fairly "significant" group of downtown business owners who feel that on-street parking should be free. However, Downtown Boulder Inc. (DBI) staff indicate that on Sundays when parking is free, all on-street spaces are completely filled by employees hours before any businesses even open.
- Even with the City's strong emphasis on encouraging the use of public transit, biking and walking when accessing downtown, there is still a 1,500+ person waiting list for a downtown parking permit and an estimated shortage of nearly 2,500 additional spaces by 2022.
- Due to the limited supply of parking in downtown Boulder, there is not enough parking inventory to support both employees and customers, so the DBI supports the City charging for parking on-street.
- Revenue from on-street paid parking supports other downtown initiatives, including and EcoPass for all downtown employees, Transportation Demand Management efforts and downtown amenities like public art and pop-jet fountains.
- As part of an ongoing, multi-year planning project (Access Management and Parking Strategy or "AMPS"), the City is creating a toolbox of funding mechanisms (i.e., Parking Benefit District, TDM District) for commercial districts who want to manage parking and raise revenue.

Missoula Parking Commission, Missoula, MT

- Population: 69,122

Program Overview

The Missoula Parking Commission (MPC) manages three parking garages, 12 surface lots, the on-street system and enforcement for downtown Missoula. They also manage a Residential Permit Parking Program adjacent to the University of Montana. Their mission is to work with government, businesses and citizens to provide and manage parking and parking alternatives – the MPC identifies and responds to changing parking needs and opportunities.

QUICK STATS

- 1,100 on-street spaces
- 1,275 spaces in garages
- 200 bike racks
- Installed parking meters in 1948
- Currently implementing new multi-space meters and Pay-by-Phone
- Offer "1st hour free" in garages
- 2014 parking revenue: $1,557,656

REVENUE FOR 2014 BY SOURCES

- Lease spaces – 44%
- Parking meters – 31%
  Parking tickets – 14%

DOWNTOWN VITALITY

- Average Commercial Lease (Rent)/Sq. Ft.: $15.12
- Retail Mix:
  - Retail: 65%
  - Restaurants and Bars: 35%
- Retail Sales Mix:
  - Retail: 60%
  - Restaurants and Bars: 40%
    Downtown Vacancy: 13%

CHALLENGES AND OPPORTUNITIES

- The Missoula Parking Commission's biggest focus recently has been working on implementation of new smart meter technology and transitioning to a different rate structure (from .25/hour to $1.00/hour). They have selected multi-space meters with a Pay-by-Phone option.
- Their second biggest priority is stakeholder and community education. The MPC works to communicate pro-actively to stakeholders about why rates are changing and that there are multiple options available for customers including less expensive off-street garage parking.

Missoula Contact Info

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Interim Director
Missoula Parking Commission
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- The Missoula Downtown Partnership (MDP) actively works with the MPC to keep downtown stakeholders informed about the changes in parking management policy and technology.
- While there is a small vocal downtown business owners who feel that parking should be free on street, the MDP supports the MPC's use of on-street paid parking to ensure turnover and availability for customer parking.
- MDP staff and board members were heavily involved in the community engagement efforts that surrounded the recent selection of new parking meter technology for downtown Missoula.
- Increased meter rates have allowed the MPC to decrease their reliance on revenue from fines, and they have seen compliance increase and fine revenue decrease.
- The MPC recently used meter revenues to invest in the award-winning Park Place parking structure. Almost immediately after the commitment was made to build Park Place, a developer purchased a significantly-sized adjacent property that had long been vacant.
- Having meters provides a diversified revenue stream that has helped MPC navigate the recession.

Epark: City of Eugene Parking Services

- Population: 159,190

QUICK STATS

- 996 on-street spaces
- 2,627 spaces in garages
- 917 bike spaces; 100 bike racks
- On-street parking is controlled by multi-space parking meters
- Pay-by-phone available (off-street only)
- Offers "1st hour free" in two largest garages (~1,000 spaces)
- Originally installed parking meters in 1939
- 2014 parking revenue: $3,100,000

REVENUE BY SOURCES

- Leased commercial space: 18%
- Monthly garage permits: 41%
- On-street meter revenue: 19%
- Daily garage parking: 12%
- Citations (in garages): 1%
- Special events: 3%
- Citations (on-street): 6%

DISTRICT VITALITY

- Average Commercial Lease (Rent)/Sq. Ft.: $24.00
- Retail Mix:
  - Retail: 50%
  - Restaurants and Bars: 50%
- Retail Sales Mix:
  - Retail: 36%
  - Restaurants and Bars: 34%
  - Other: 30%
  - District Vacancy: 25%

Eugene Contact Info

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CHALLENGES AND OPPORTUNITIES

- Epark Eugene has parking management jurisdiction for the entire city of Eugene including enforcement of public streets on the University of Oregon campus. The downtown program (which includes a 52-block area) accounts for about half the overall program in size and in revenue generated.
- There is a mixture of coin-operated meters and single-space credit card enabled meters throughout downtown Eugene and on the University of Oregon campus. Multi-space meters are also being piloted in some areas.
- The City is currently transitioning from a Residential Parking Permit Program (RPPP) that costs $40/ annually to a market-based fee structure that will cost $150 per quarter (or $600/annually).
- In 2010, parking meters were removed from a 12-block area in downtown Eugene where the City wanted to incentivize redevelopment. Now that the area is nearly redeveloped, the business owners are asking the City to reinstall meters to encourage turnover and address the issue of employees parking on-street.

- The biggest challenge that Epark is currently facing is its decentralized organizational structure. Maintenance of the off-street facilities is currently managed by another City department, as is fine adjudication.
- Downtown Eugene offers a variety of transportation options, including bus depot, train station and Bus Rapid Transit connect to the University of Oregon.
- According to the Eugene Chamber (Downtown Eugene Inc.), off-street garages are almost never at capacity, however there are very few available on-street spaces.
- While downtown vacancy is at about 25%, this is mostly because there are a few very large vacant spaces; most of the smaller retail spaces leased at the beginning of summer 2015.
- Downtown retail is majority locally-owned and can be very seasonal; there are some businesses that aren't open for months at a time (especially when school is not in session).
- Parking garage safety is biggest concern for downtown business and property owners.
- The E-Park program in Eugene is known for its creativity in the use of public art. Their "Poetry in Parking" program has garnered national attention.

PEER CITY COMPARISONS

The programs noted in this section are not truly "peer cities" in the tradition sense. As noted above these communities were selected more as "cities we can learn from". As a result, rather than develop a comparative matrix of specific community parking statistics, a more appropriate analysis would be to summarize the aspiritational elements of the selected programs that the emerging Cleveland County/City of Norman parking program might emulate as it evolves over time. Below are the key elements from each program that makes these program special.

While all three of these programs are known for their mastery of parking management fundamentals, each of these programs have evolved to reflect the values and culture of their communities.

Boulder, CO

- The fact that Boulder Parking and Access Management program has been renamed the "Department of Vitality" sheds insight into the way that Boulder approaches parking and related access management strategies. Parking and access issues are managed as an element of community and economic development.
- The same City department that manages the Pearl Street Mall as the economic heart of downtown Boulder, also manages parking and access issues (including transportation demand management, promotion of alternative transportation modes and community sustainability goals).
- Over the decades, the City has developed multiple parking revenue streams related to parking including off-street parking lots and garages, on-street parking, pakring enforcement and a payment in lieu of parking program.
- During the past decades, Boulder's parking system has evolved into a nationally recognized, district-based, multi-modal access system that incorporates transit, bicycling and pedestrians, along with automobile parking.
- The City takes an integrated approach to parking management and actively encourages the use of alternative modes of transportation. 56% of people accessing downtown by car, 19% walk, 9% take the bus, 9% bike and 9% use other methods like carpooling.
- Boulder has made a conscious decision to keep parking supply tight (not overbuilding parking supply) and charging fairly high rates for parking to encourage the use of transporation alternatives.
- Boulder has invested in strong parking and transportation planning (See their recent "Access Management and Parking Strategies" (AMPS) study as an example.) as well as investing in advanced parking technology options (new off-street parking access and revenue control systems, new on-street meters, pay-by-phone options, etc.
- Boulder also places a strong emphasis on community out-reach processes with parking planning being integrated with larger community plans. Boulder has taken its "lessons learned" from the development of their successful downtown district and is applying these lessons to the development of other emerging districts around their community.

Missoula, MT

- Missoula is another community that has maintained parking meters for decades without taking them out as many communities have. Despite having low on-street parking rates, the system was able to fund a significant new garage during the height of the recent recession.
- The Missoula Parking Commission is a quasi-independent City department with a separate Board of Commissioners and budget.

- The Parking Commission Executive Director was heavily involved in nearly every major downtown organization (Missoula Redevevlopment Agency, Business Improvement District, Downtown Business Partnership, even the local Rotary and Symphony Association. This deep community engagement had multiple positive outcomes in terms of program acceptance and community education.
- The Parking Commission (partly because of the degree of connectivity between all the major downtown organizations) was also a strong financial supporter of major community planning efforts. A good example of this was the fact that the Parking Commisison contributed $125,000 toward a downtown master plan project which generated not only a successful downtown master plan, but also a master plan with a specific "parking strategic Plan" as an integrated master plan component.
- The Parking Commission was also part of an on-going downtown master plan implementation committee that has remained active for almost a decade.
- The Parking Commisison recently saw their long-term executive director retire after more than 20 years after having successfully implementing the last of the major parking strategic plan action items (an upgrade of their on-street meter and parking garage technologies).
- The community is currently updating their 2009 downtown master plan. The Parking Commission is once again at the table as a key funding partner and active plan update participant.

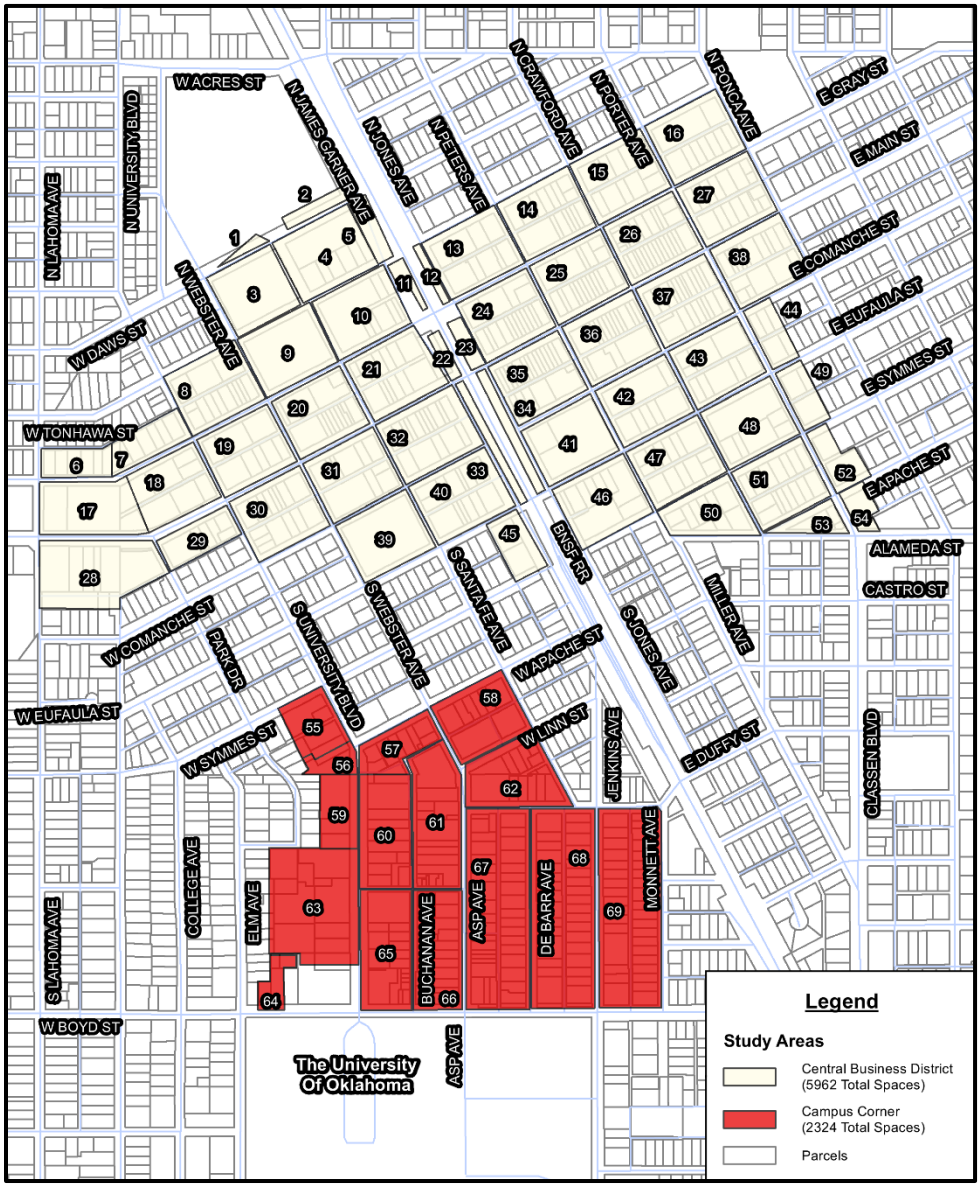
Eugene, OR

- The Eugene, OR "Epark" program has parking management responsibility for the entire city of Eugene including enforcement of public streets on the University of Oregon campus.
- The downtown parking management program accounts for about half the overall program in size and in revenue generated.
- Coin-operated meters are being replaced with single-space credit card enabled meters throughout downtown Eugene and on the University of Oregon campus. Multi-space meters are also being piloted in some areas.
- The City also manages a robust Residential Parking Permit Program (RPPP).
- The biggest challenge that Epark is currently facing is its decentralized organizational structure. Maintenance of the off-street facilities is currently managed by another City department, as is fine adjudication. Creating a single, vertically integrated city department has been challenge for Eugene.
- Downtown Eugene offers a variety of transportation options, including bus depot, train station and Bus Rapid Transit connect to the University of Oregon.
- Parking garage safety is biggest concern for downtown business and property owners.
- The E-Park program in Eugene is known for its creativity in the use of public art. Their "Poetry in Parking" program has garnered national attention.

Limited Parking Supply/Demand Update

In order to understand existing parking assets, usage patterns, and overall parking demand needs for Norman's core neighborhoods and downtown, Kimley-Horn coordinated with the County and City to identify the areas of focus for this report's data collection efforts. It was determined that the area which included downtown and the Campus Corner area was the primary area of focus for this effort, shown in Figure 3.2. Figure 3.2 also shows the numbered block system that was used to identify each city block in the data collection process.

Figure 3.2 Study Area



The following provides an overview of what was included in the parking supply/demand analysis conducted by Kimley-Horn:

1. Parking inventory was collected by block for the entire study area.
2. Parking occupancy was collected by block for the entire study area.
3. Parking data was collected on a weekday beginning at the peak hour identified in the Jacobs study at 10:00am.

Appendix 38 provides detailed parking inventory and occupancy data by block.

- Table 1 provides updated parking inventory numbers for both on and off-street parking by block
- Table 2 provides updated on-street parking occupancy data by block
- Table 3 provides updated off-street parking occupancy data by block

Parking Inventory

A parking inventory was completed in the identified data collection area as part of the April 2016 Parking Study, and updated in September 2017. The study area is depicted in Figure 1 above.

As shown in Appendix 38, Table 1, there are approximately 8,311 parking spaces within the study area, approximately 1,313 (15.8%) of which are on-street. This leaves approximately 6,998 (84.2%) parking spaces located in parking lots or parking garages.

Parking Occupancy

Parking occupancy data was also collected for each of the blocks in the study area at the same time as the parking inventory. Parking occupancy was collected beginning at the peak hour of the overall study area as observed during the 2016 study between 10:00 a.m. and 11:00 a.m.

The block-by-block results are broken down into on-street and off-street parking occupancy and are summarized in Tables 2 and 3 on the following pages.

As shown in Appendix 38, Table 2, there are approximately 1,313 on-street parking spaces, of which approximately 608 (46.3%) were occupied at the time of the counts, and approximately 6,998 off-street parking spaces, 3,838 (54.8%) of which were occupied at the time of the counts.

Data Analysis & Limited Parking Supply/Demand Assessment

Overall Parking Occupancy "Heat Map" Summary

The following graphic (Figure 3.3) summarizes the overall parking demand for the study area using a "heat map" illustration which documents the parking demand by block at the peak demand timeframe.

As Figure 3.3 illustrates, the overall area is relatively underutilized. Localized blocks in the downtown and Campus Corner do experience a high demand for parking spaces. However, each of these instances are located immediately adjacent to blocks exhibiting less than 40% occupancies.

Reviewing parking occupancies by type, however, paints a very different picture. As show in in Figure 3.4, many private parking facilities throughout the study area are operating above 80% occupancy.

Figure 3.3 Parking Demand Heat Map – Weekday Peak Hour All Facilities

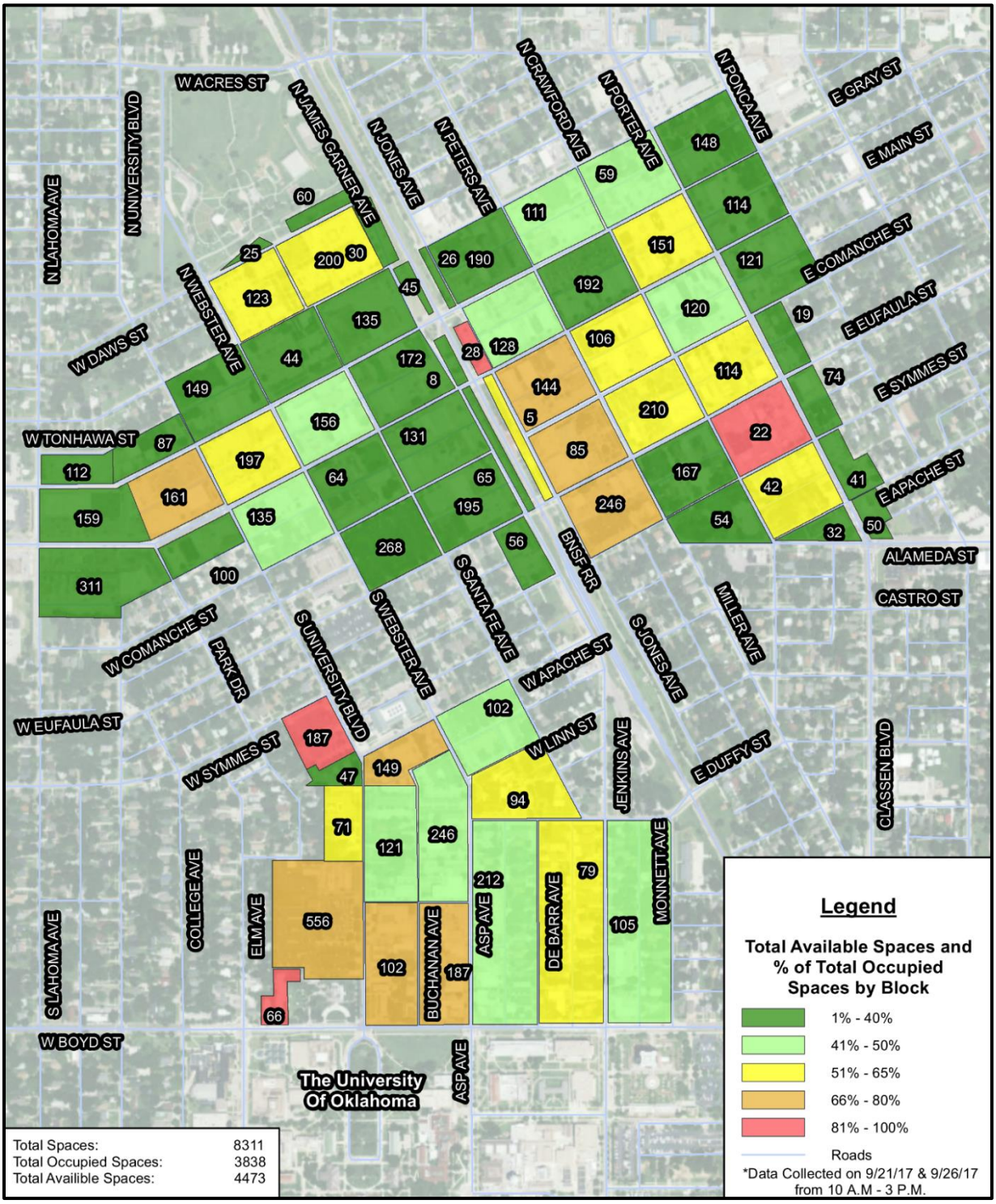
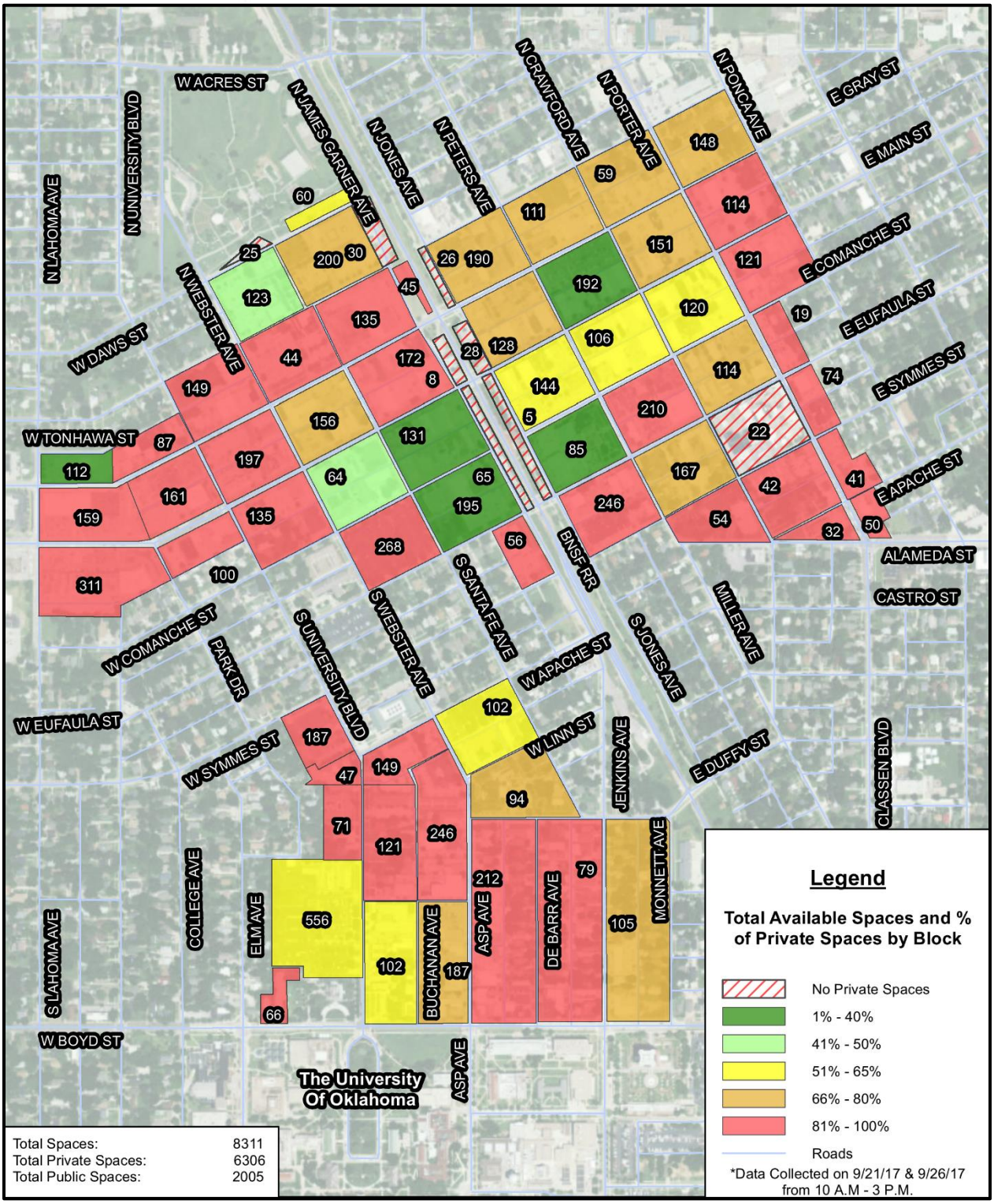
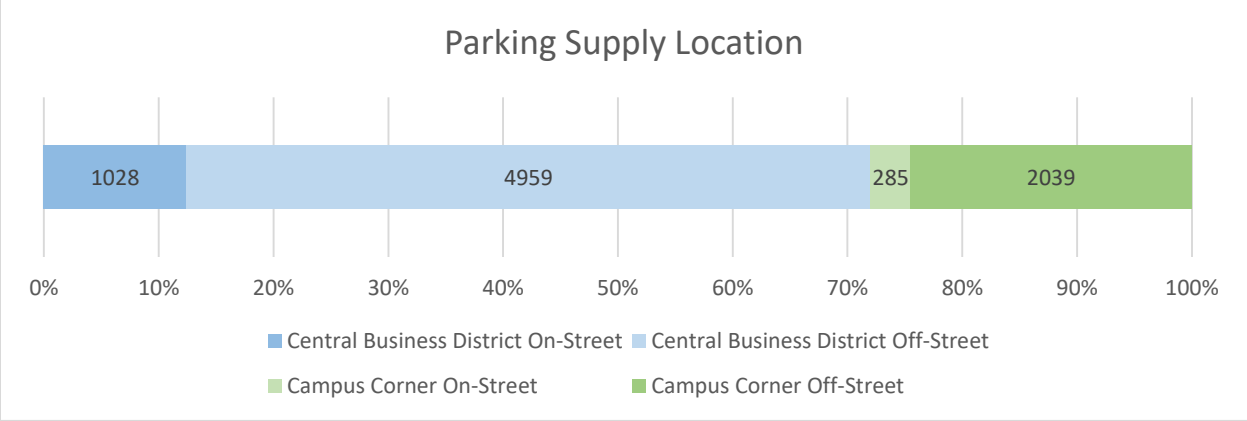


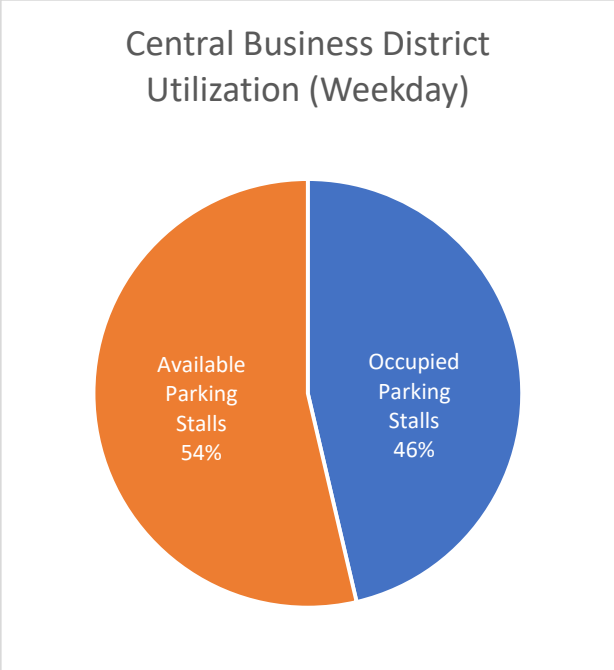
Figure 3.4 Parking Demand Heat Map – Weekday Peak Hour Private Facilities

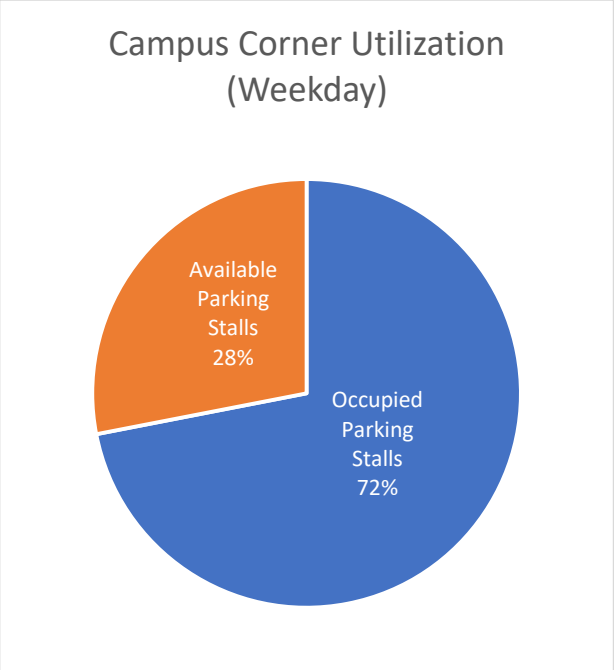


Campus Corner and Central Business District

Two sub-areas of the overall study area were further analyzed for supply and occupancy. These areas, the Central Business District and Campus Corner, are included in the detailed listing of supplies and occupancies included above and summarized by area below.







As shown above, parking supplies are concentrated within the Central Business District, however parking occupancies are significantly higher within the Campus Corner sub-area.

Current Parking Adequacy

In the Norman Downtown Parking Study document (2016), downtown parking is described as "adequate to accommodate the parking demands calculated for the district as a whole". The information presented in this report supports and confirms this assessment of the current parking conditions from a supply/demand perspective. While there are pockets of localized high parking occupancies, each of these instances has availability within the immediate vicinity. One area to be closely monitored moving forward is the Campus Commons sub-area. As occupancies approach 85%, parking patrons are likely to begin to experience growing frustrations in finding available parking.

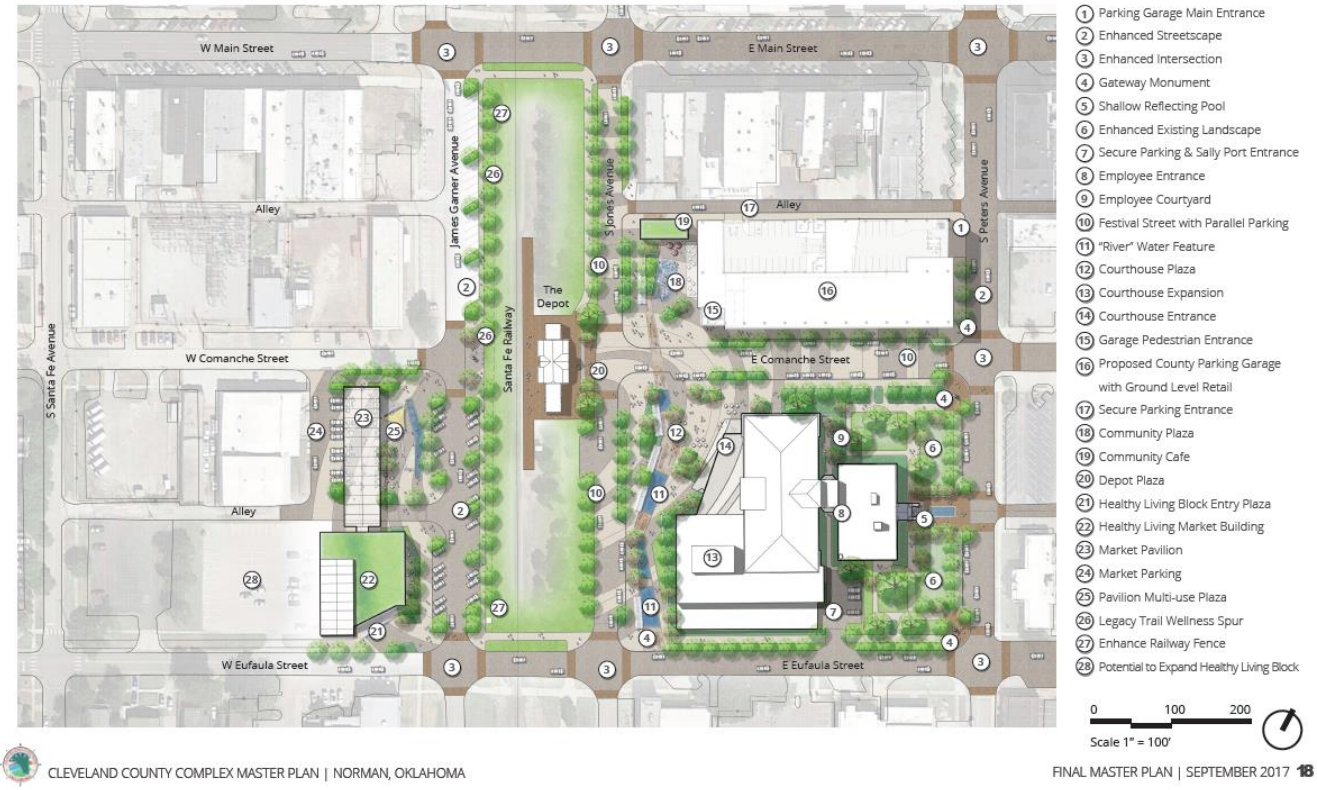
As new projects are built they should supply sufficient parking for any related increased demand based on current City zoning and parking requirements. Current City code recognizes that mixed-use downtown neighborhoods require fewer parking spaces than stand-alone sub-urban developments based on the application of shared parking principles. Additionally, with future development, parking system performance should be regularly evaluated and residential parking permit programs should be considered to protect adjacent neighborhoods from parking spillover from downtown uses. A whitepaper on residential parking permit programs is provided in the appendices of this report to provide more background and best practices. Additionally, a set of parking garage design guidelines has been provided in the report appendices as a tool for future parking garage development.

Future Parking Demand Projections

Given the fact that the 2016 Jacobs parking supply/demand study was completed within the past two years and based on conversations with planning staff, future parking demand projections are essentially unchanged, Kimley-Horn did not have any new data to analyze in this area. The Jacobs study future parking need projections are summarized in the "Planning Context" chapter on page 21 above and Appendix 44 – 2016 Jacobs Parking Study Summary.

The most significant potential development project in the downtown area is the Cleveland County Complex Master Plan. The image below is the "illustrative master plan concept" in its current form and includes the proposed county parking structure (plan element 16) with ground level retail.

[final master plan illustrative]



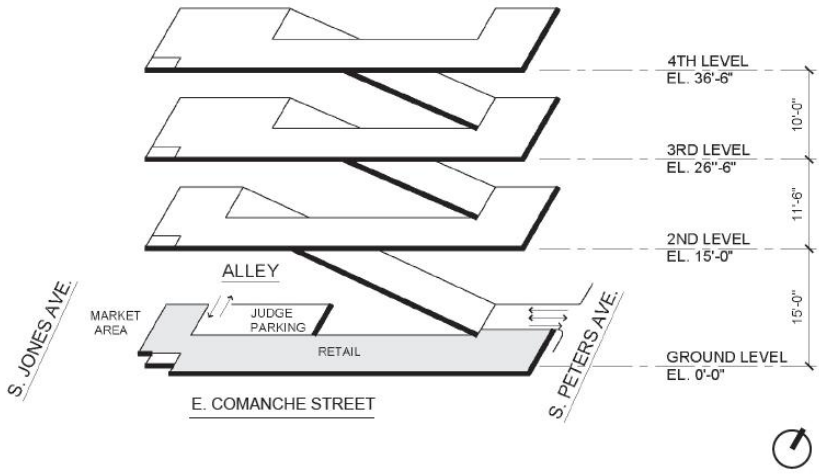
CLEVELAND COUNTY COMPLEX MASTER PLAN | NORMAN, OKLAHOMA

FINAL MASTER PLAN | SEPTEMBER 2017 18

The following diagram illustrates the proposed master plan's parking garage concept plan. The plan assumes approximately 390 spaces and approximately 22,200 s.f. of ground level retail space. Projected parking structure costs are noted below:

Garage Item	Item Cost	Unit	Cost per Item
390 Parking Spaces	$ 18,000	per Space	$7,020,000
22,200 GSF Retail Shell	$ 120	per GSF	$2,664,000
		Total Cost	$9,680,000
		Approximate Cost per Space	$24,800

[isometric view]



CLEVELAND COUNTY COMPLEX MASTER PLAN | NORMAN, OKLAHOMA

FINAL MASTER PLAN | SEPTEMBER 2017 47

The following text is an excerpt from the Cleveland County Complex Master Plan documents:

> *"The Cleveland County Courthouse Master Plan identifies the need for a new parking structure to serve the courthouse as well as other uses in the area. Through meetings and workshops with the County and other key stakeholders, the EDSA Team identified an approximate program for the garage and the location.*
>
> *The garage is to be located on the block adjacent and north of the courthouse and across S. Jones Avenue from the AMTRAK Station. The block is bound to the east by S. Peters Avenue, to the south by E. Comanche Street, and to the west by S. Jones Avenue.*
>
> *The key criteria to incorporate into the garage program include the following items, as feasible:*
>
> - *active uses at the grade-level along E. Comanche Street and S. Peters Avenue,*
> - *maximize the number of parking spaces that can fit in a four-story garage,*
> - *incorporate secure parking for County judges and other dignitaries, and*
> - *maintain a width that is sufficient to provide a viable public gathering area along the west edge of the garage within the footprint of the block.*
>
> *An approximate construction cost for the garage has been prepared based on typical cost per space for parking spaces and per square foot of retail shell space and an architectural scheme that is attractive but not extravagant.*

Typical costs for parking garages of this type range from below $18,000 per space to well over $30,000 per space. A lower cost option for this garage was assumed and the overall cost is estimated at about $9,680,000 or about $24,800 per space. The cost of the retail space is based on providing cold, dark shell space with no tenant fit-out. For the purposes of this estimate, there is a potential additional estimated 1 to 1.5 million for a building facade wrap."

Kimley-Horn generally agrees with the parking garage cost information used above. In the following section, Kimley-Horn has provided an updated summary of parking structure development costs. This analysis also provides some discussion related to a variety of factors affecting parking structure costs. While our research places the national average construction cost for a parking garage at $20,769 per space or $62.18 per square foot, the $24,800 per space cost noted in the Cleveland County Courthouse Master Plan is a good budget number.

Parking Structure Development Costs Update

The following is an update on parking structure development costs. Based on a review of several industry sources, including hundreds of completed parking structure projects of varying size, scope, and geographic location (omitting parking structures that are entirely below-grade because the cost of such structures is much higher), the national median construction cost for a new parking structure in 2018 is approximately **$19,000 – $20,000 per space or $56.99 – $59.00 per square foot**, increasing approximately 2.5% from 2016, when the median cost was approximately $18,600 per space based on historical data.

A recent parking garage project at OU came in at less than the national average. This may be the best benchmark for the County/City to use assuming the basic design and general conditions are similar.

Construction cost data does not include items such as land acquisition, architectural and engineering fees, environmental evaluations, materials testing, special inspections, geotechnical borings and recommendations, financing, owner administrative and legal, or other project soft costs. Soft costs are typically 15% to 20% of construction costs.

Features Typically Included in a Median Cost Parking Structure:

- Precast concrete superstructure
- Attractive precast concrete facade, but with basic reveal pattern
- Shallow spread footing foundations
- All above-grade construction
- 8' 6" to 8' 9" wide parking spaces
- Glass-backed elevators and unenclosed stairs clad with glass curtain wall to the exterior
- Basic wayfinding and signage
- Open parking structure with natural ventilation, without mechanical ventilation or fire sprinklers
- Little or no grade-level commercial space
- Basic parking access and revenue control system
- Energy efficient fluorescent lighting

Enhanced Design Features That Could Increase Construction Costs Above the Median Range:

- Cast-in-place, post-tensioned concrete superstructure for lower maintenance
- Attractive facade with precast, brick, metal panels, and other materials
- 8' 9" to 9' 0" wide parking spaces for user comfort
- Green Garage Certification following the Green Parking Council standards
- Energy-efficient LED lighting with occupancy and photocell computer controls
- Custom wayfinding and signage system
- Storm water management including on-site retention/detention
- Deep foundations, such as caissons or pilings
- Below-grade construction
- Enclosed stair towers due to local code requirements
- Enclosed parking structure without natural ventilation, where mechanical ventilation and fire sprinklers are required
- Grade-level commercial space
- Mixed-use development where the parking is integrated with office, retail, residential, or other uses
- State-of-the-art parking access and revenue control system
- License plate recognition systems
- Parking guidance systems
- Count system with variable message LED signs
- Pay-on-foot parking revenue control stations
- Wi-Fi and cellular services

FACTORS AFFECTING PARKING STRUCTURE COSTS

People often think of parking structure development costs primarily in terms of dollars per space, however, there are many other factors that should be considered. The cost of a parking space is a product of parking efficiency (square foot per space) and structure efficiency (dollars per square foot). Each component plays a critical role in determining the ultimate cost of a parking facility. Parking efficiency is the total gross area of a parking structure, inclusive of stairs, elevators, and all parking floors, divided by the number of spaces. Typical parking efficiency for an above ground, stand-alone garage is 300 to 350 Square feet per space. Many below-grade or mixed-use garages can have parking efficiencies of 400 to 500 square feet per space. Factors affecting parking structure development costs include:

- **GEOGRAPHY -** Construction costs vary by location due to regional factors such as the cost of labor and availability of materials. In addition, factors such as higher seismic regions and soil conditions have a large impact on cost.
- **NUMBER OF PARKING LEVELS -** In general, a larger-footprint parking structure with fewer levels will cost less per parking space than a taller structure with a smaller footprint. The cost per square foot of the first level at-grade is less than levels elevated above the ground. A lower-height, larger-footprint structure will have a higher proportion of the cost in the first level. Taller structures are heavier which affects the foundation cost. A taller structure generally has a less efficient parking layout, which translates into more square footage for each parking space.

- **PARKING BELOW-GRADE -** Parking below-grade is much more expensive than parking above-grade. A five-level, above grade parking structure may cost $50 per square foot. If this same structure is depressed one level below-grade, the cost can increase approximately 15% to $57.50 per square foot. If the same structure is put two levels below ground, the cost increases even more because of the impacts of having to dig deeper (45% higher than the original cost or approximately $72 per square foot).
- **STRUCTURAL SYSTEM -** 60% to 70% of parking costs are in the structural system. As such, the type of framing system will have a significant effect on the cost of each parking space. There are two general types of framing layouts—short-span and long-span. Short span requires a column approximately every three parking spaces (27x30 feet square) to support the floor slab. Long span requires columns spaced 60 feet apart, with beams spanning over the stalls and drive aisle. Generally, short-span systems cost less per square foot, but negatively effects efficiency. Long-span systems cost more per square foot, but result in more stalls in the same square footage.

  The structural system can be cast-in-place concrete, precast concrete, or structural steel. The most cost-effective option depends on the project's location and the region's preferred construction methods. The selection of a system not common in the area will generally cause the cost to increase.
- **FOUNDATION -** Structures built in areas with poor soil conditions requiring more expensive, deeper foundation systems will cost more. The difference between a shallow and deep foundation system can increase the price approximately 10% overall—taking the cost from $50 to $55 per square foot, for example.
- **ARCHITECTURAL FACADE TREATMENT -** The appearance of a parking structure is important to the surrounding environment. The cost of making that structure more aesthetically-pleasing can affect the cost per parking space of up to 15%. If the structural system is used to create the architectural facade, the cost per square foot will be less. However, the use of architectural elements in addition to the structural system will increase the cost. If the architectural design creates an inefficient structural system, the cost could increase drastically.
- **TOTAL PARKING SPACES -** A smaller project will cost more per space than a larger project. A 200-space parking structure on a small site may cost about 30% more per square foot than a 1,000-stall structure on a reasonably sized lot.
- **PARKING EFFICIENCY -** The cost of a parking space is the cost per square foot multiplied by the square footage per space. The more square footage per stall, the higher the cost.

  Example:
  - Typical efficiencies for short-span structures: 330-390 sf/stall
  - Typical efficiencies for long-span structures: 300-340 sf/stall
  - Typical efficiencies for mixed-use structures: 400+ sf/stall

  Example:

  Assume a 500-space structure costs $50 per square foot:
  - 330 sf/stall * 500 stalls = 165,000 sf * $50/sf = $8,250,000
  - 360 sf/stall * 500 stalls = 180,000 sf * $50/sf = $9,000,000

  The difference is $750,000, or $1,500 per stall.

- **PREMIUM ELEMENTS -** Program elements added to parking will increase the cost per stall. A photovoltaic system covering 50% of the top level can add approximately 25-30% to the building's cost per square foot of the building. However, there may be operational cost savings that can support this type of elements. A mixed-use component will also increase the cost per stall due to negative impacts on efficiency and the structural framing system. Special site conditions such as the need to reroute utility lines or perform substantial demolition may increase cost as well.
- **MARKET CONDITIONS -** The cost of parking can be negatively and positively affected by market conditions by 10% or more. A normal bid market will generate four to six bids from qualified contractors. An aggressive bid market might see 10 or more bids, causing the price to decrease. This can also create concern if the bidders are not qualified. An impacted bid market might see one to three bidders and a price increase due to lack of competition.

In the end, most owners budget for parking in terms of dollars per space. To be as accurate as possible, it is best to understand the project in terms of parking efficiency as well as structural efficiency. Design decisions that enhance efficiency can often help make a project more financially feasible.

Sources:

1. FIXR, Build a Parking Garage Cost (https://www.fixr.com/costs/build-parking-garage)
   Note: FIXR estimates a $59 per square foot cost, though their estimate of the national average stands between $50 to $70 for most projects.
2. International Parking Institute, "How Much Does a Structure Cost?" H. Dean Penny, Kimley-Horn
3. Victoria Transport Policy Institute, "Parking Costs" (www.VTPI.org)
4. Carl Walker, Inc., "Parking Structure Cost Outlook" (www.carlwalker.com)
5. *Parking Today*, "The Top 10 Issues Affecting the Cost of Building a Parking Space" by Watry Design

Future Potential Parking Development Sites

Per the project scope of services, Kimley-Horn was to evaluate other identified potential parking structure development sites. Three sites were identified as good potential future parking garage sites. Three sites were also evaluated as potential surface lot development sites.

The three potential parking development sites assessed by Kimley-Horn below include sites located at:

- W. Gray Street and N. Santa Fe Avenue
- S. University Boulevard near White Street and
- Site between Asp Avenue and Buchanan Avenue (2 options)

For each site, a potential parking garage footprint is identified, recommended floor-to-floor heights are provided, bay/space dimensions are provided, parking space orientation, circulation systems and number of garage levels are recommended and overall garage design efficiency is calculated.

The three surface parking lot site concepts assessed by Kimley-Horn below include sites located at:

- Campus Corner site between Asp Avenue and Buchanan Avenue (2 options: 40 degree angled parking and 90 degree parking)
- CBD site 03 (from Jacobs report) W. Gray Street and N. Santa Fe Avenue

Potential Garage Site – Option #1: *Site A: W. Gray Street and N. Santa Fe Avenue*

CBD 03 (West Gray Street Site)

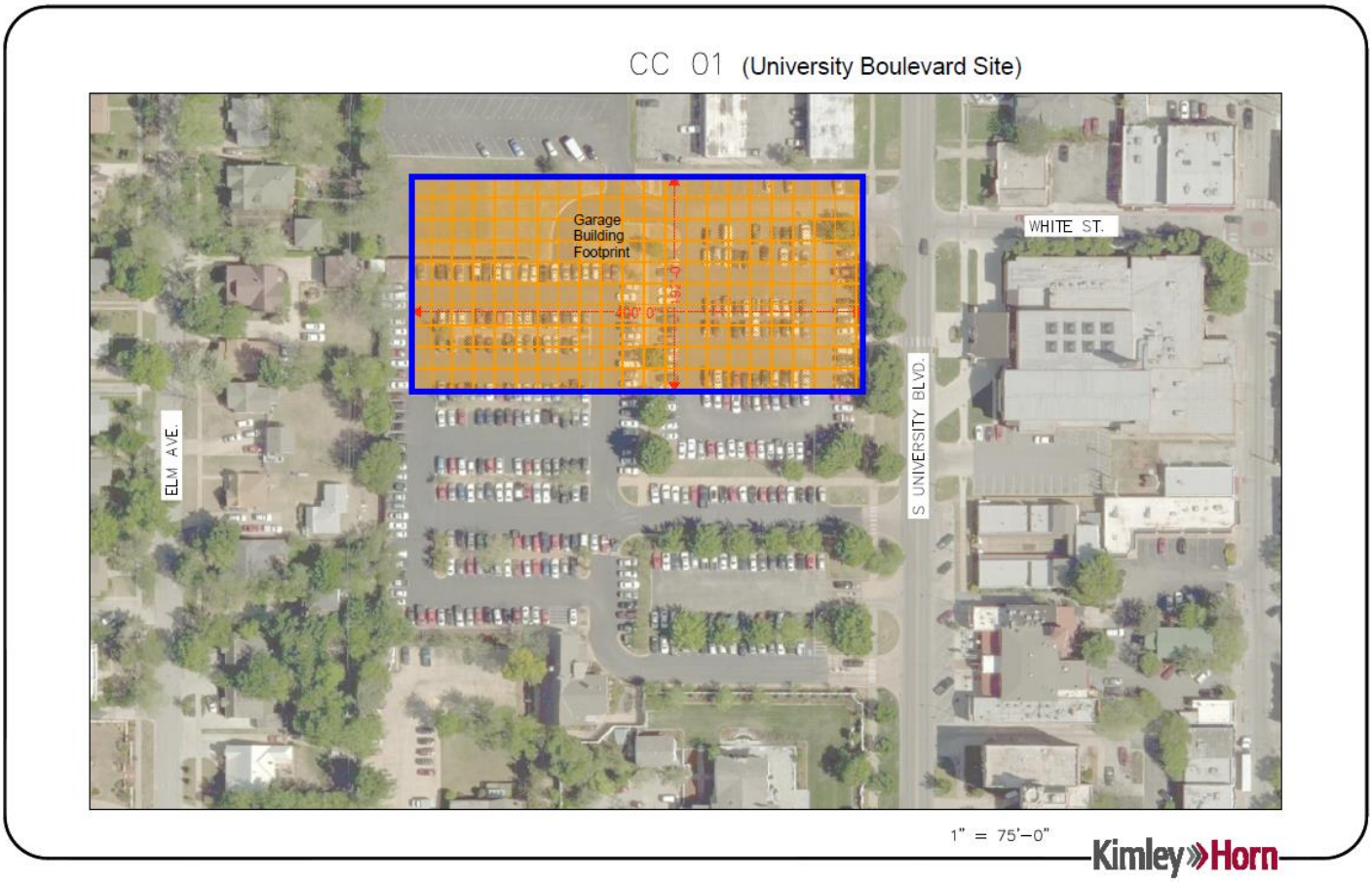
1" = 60'–0"

Kimley»Horn

Site CBD 03 (West Gray Street Site) Concept Attributes:

- Structure Footprint: approximately 260 ft. by approximately 128 ft. with gross building square footage for parking of approximately 121,470 sq. ft.
- Floor-to-floor height of approximately 11'-4" and 10-4" with a height to top of perimeter guardrail/bumper wall of ±36 ft.
- Two 62'-0" wide parking bays with standard (9'-0" x 19'-0" per City code) 90-degree parking spaces, two-way traffic circulation and single thread parked on ramping system for vehicle circulation between levels.
- Four levels (one grade level, three elevated levels) of parking providing approximately 335 parking spaces. Note that this total does not account for loss of spaces due to ADA accommodations, motorcycle and bicycle parking and utility and storage rooms.
- Average design parking efficiency of 363 sq. ft. per stall. No end-bay parking.

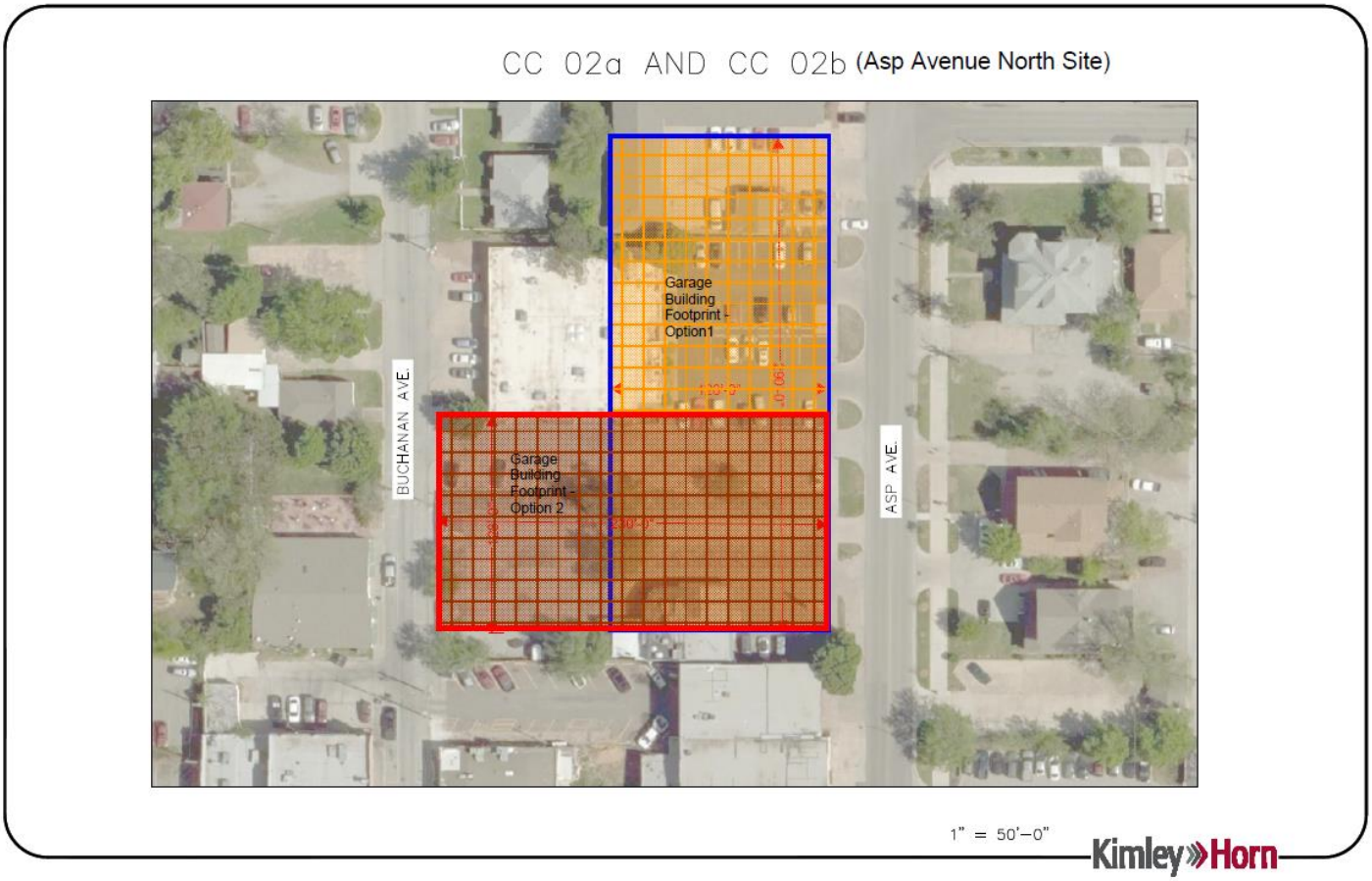
Potential Garage Site – Option #2: *Site B: South University Boulevard near White Street*



Site CC 01 (University Boulevard Site) Concept Attributes:

- Structure Footprint: approximately 400 ft. by approximately 192 ft. with gross building square footage for parking of approximately 203,500 sq. ft.
- Floor-to-floor height of approximately 11'-4" and 10-4" with a height to top of perimeter guardrail/bumper wall of ±25.5 ft.
- Three 62'-0" wide parking bays with center bay ramped and standard (9'-0" x 19'-0") 90-degree parking spaces, two-way traffic circulation and single thread parked on ramping system for vehicle circulation between levels.
- Three levels (one grade level, two elevated levels) of parking providing approximately 626 parking spaces. Note that this total does not account for loss of spaces due to ADA accommodations, motorcycle and bicycle parking and utility and storage rooms.
- Average design parking efficiency of 325 sq. ft. per stall.

Potential Garage Site – Option #3: *Site C: Site between Asp Avenue and Buchanan Avenue*



Combined Sites CC 02a and CC 02b (Asp Avenue North Site) Concept Option 1 Attributes:

- Structure Footprint: approximately 290 ft. by approximately 128 ft. with gross building square footage for parking of approximately 135,500 sq. ft.
- Floor-to-floor height of approximately 11'-4" and 10-4" with a height to top of perimeter guardrail/bumper wall of ±36 ft.
- Two 62'-0" wide parking bays with standard (9'-0" x 19'-0") 90-degree parking spaces, two-way traffic circulation and single thread parked on ramping system for vehicle circulation between levels.
- Four levels (one grade level, three elevated levels) of parking providing approximately 400 parking spaces. Note that this total does not account for loss of spaces due to ADA accommodations, motorcycle and bicycle parking and utility and storage rooms.
- Average design parking efficiency of 335 sq. ft. per stall.

Combined Sites CC 02a and CC 02b (Asp Avenue North Site) Concept Option 2 Attributes:

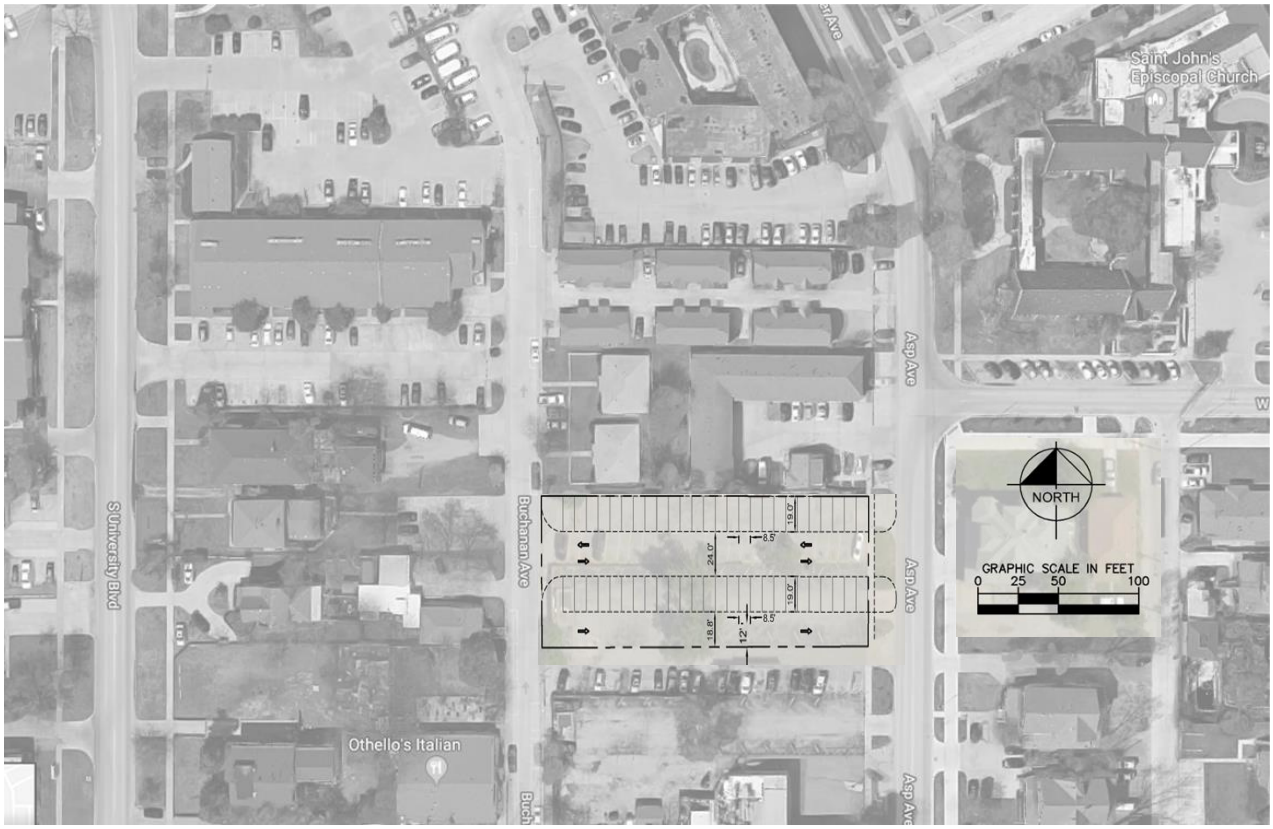
- Structure Footprint: approximately 230 ft. by approximately 128 ft. with gross building square footage for parking of approximately 107,500 sq. ft.
- Floor-to-floor height of approximately 11'-4" and 10-4" with a height to top of perimeter guardrail/bumper wall of ±36 ft.

- Two 62'-0" wide ramped parking bays with standard (9'-0" x 19'-0") 90-degree parking spaces, two-way traffic circulation and single thread parked on ramping system for vehicle circulation between levels.
- Four levels (One grade level, three elevated levels) of parking providing approximately 310 parking spaces. Note that this total does not account for loss of spaces due to ADA accommodations, motorcycle and bicycle parking and utility and storage rooms. No end bay parking
- Average design parking efficiency of 345 sq. ft. per stall.

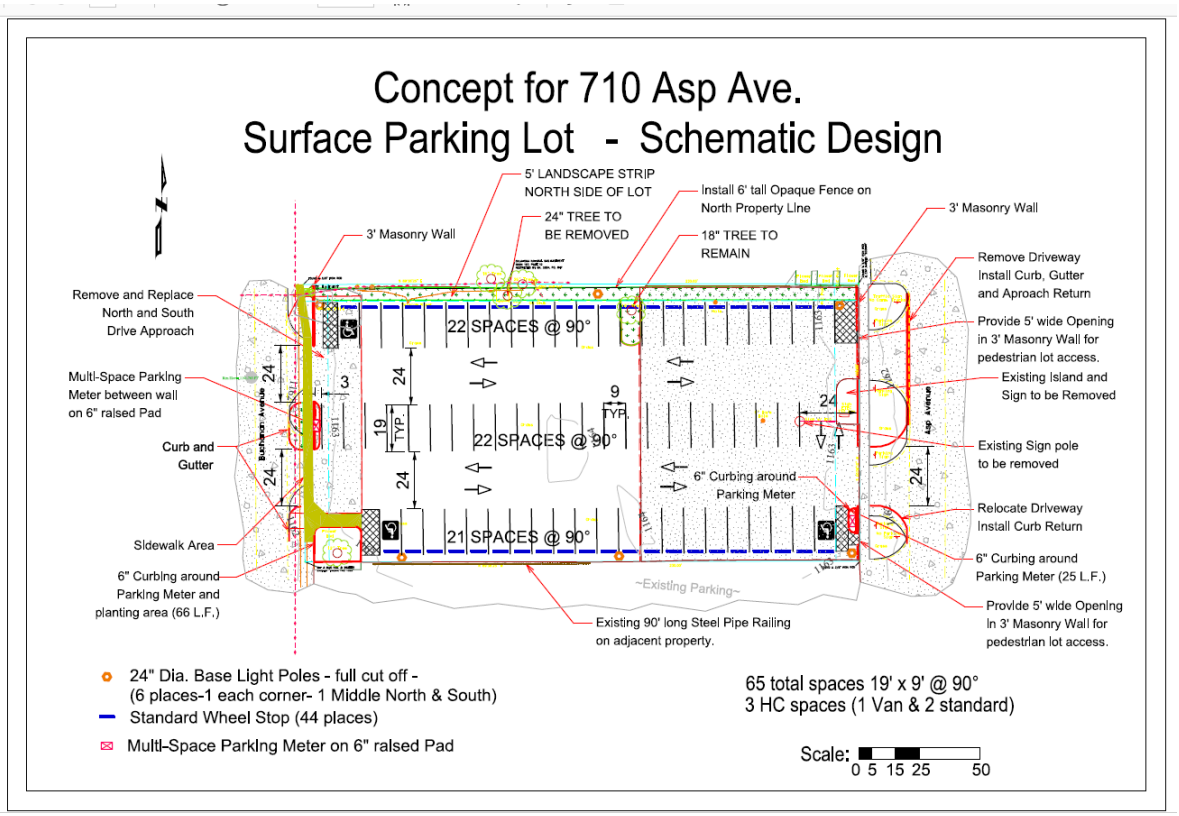
Potential Parking Lot Site – Option #1: *Campus Corner site between Asp Avenue and Buchanan (Two Options)*

- Option 1:
  - This site is currently a surface lot with 36 spaces
  - The 40-degree parking option creates 45 spaces

- Option 2:
  - The 90-degree parking option creates 45 spaces

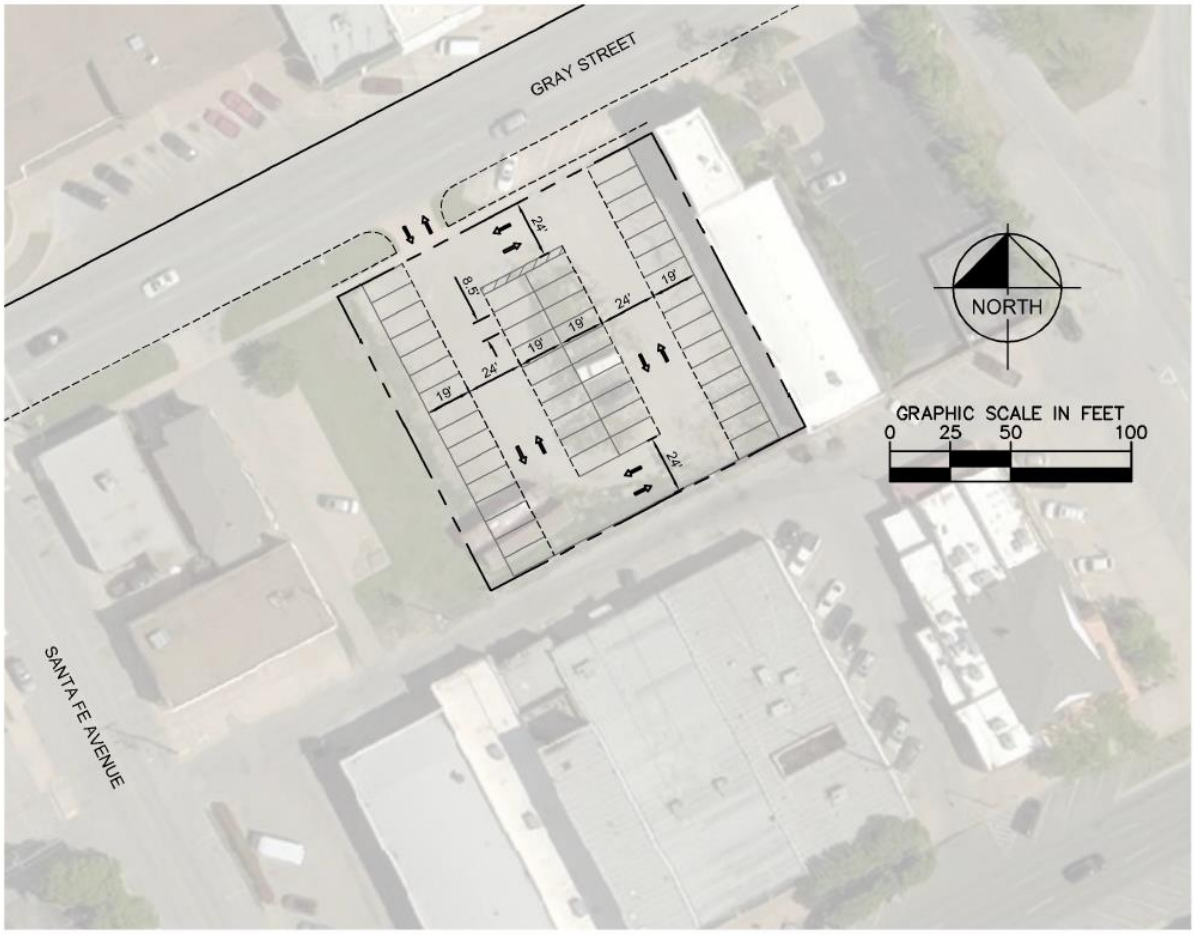

Saint John's Episcopal Church
Asp Ave
S University Blvd
Birchann Ave
Othello's Italian
NORTH
GRAPHIC SCALE IN FEET
0 25 50 100

Note: As of 11/11/2018, this project is moving forward. Below are the plans that the City engineer provided re: the final design for this recommended lot.



Potential Parking Lot Site – Option #2: *CBD site 03 (from Jacobs report) W. Gray Street and N. Santa Fe Avenue*

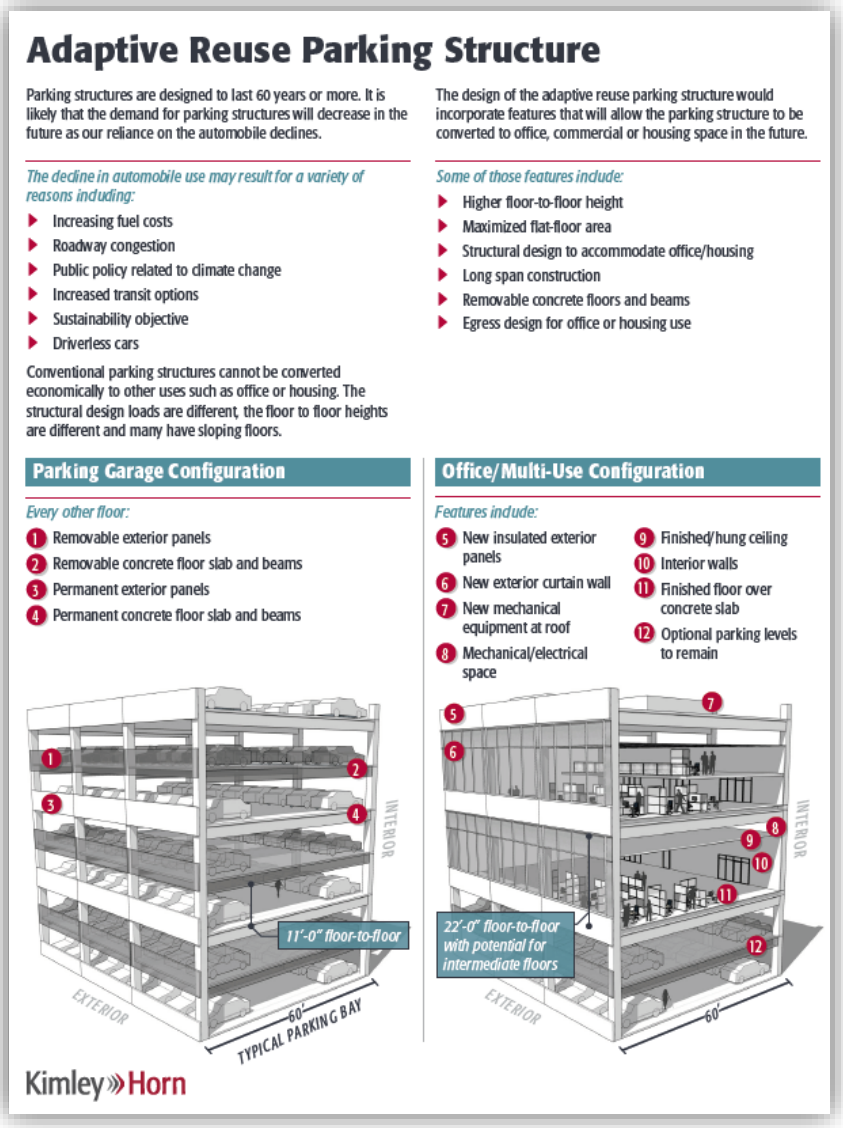
- Currently an un-improved lot, the proposed layout provides 52 spaces.



The current average cost per space for surface parking lot is approximately $5,000 per space. Using this estimated cost per space this project would cost approximately $260,000.00.

Planning for the Adaptive Reuse of Parking Structures

Looking to the future, parking professionals, architects, planners and designers are all considering the impact to traditional parking structures if the promise of autonomous vehicles becomes a reality. Early projections estimate a potential reduction in parking demand in the 30% – 50% range (within 20 – 30 years). Under this scenario, designing parking structures that could "adaptively reuse" 30% – 50% of the structure for other uses (office, residential, classroom, day care, etc.) only makes sense to evaluate.



This report section (and supporting documents referenced below) explore the technical issues associated with the concept of adaptive reuse parking facilities. Designs must consider future direction of the industry, including the following trends:

- Migration of suburbanites to urban centers
- Millennials driving less and forgoing car ownership
- Car sharing services (e.g., Uber, Lyft, Zipcar)
- Connected and autonomous vehicles
- The drive toward reducing vehicular traffic and communities becoming more pedestrian-friendly and walkable

Many communities are taking measures to meet the evolving parking and transportation needs of communities of today and of the future. For example, forward-thinking administrators are revising their zoning codes and moving away from the minimum parking ratios to maximum parking ratios for selected land uses. In addition, most are recognizing reductions in parking demand for transit-oriented developments (TODs) and shared-use parking.

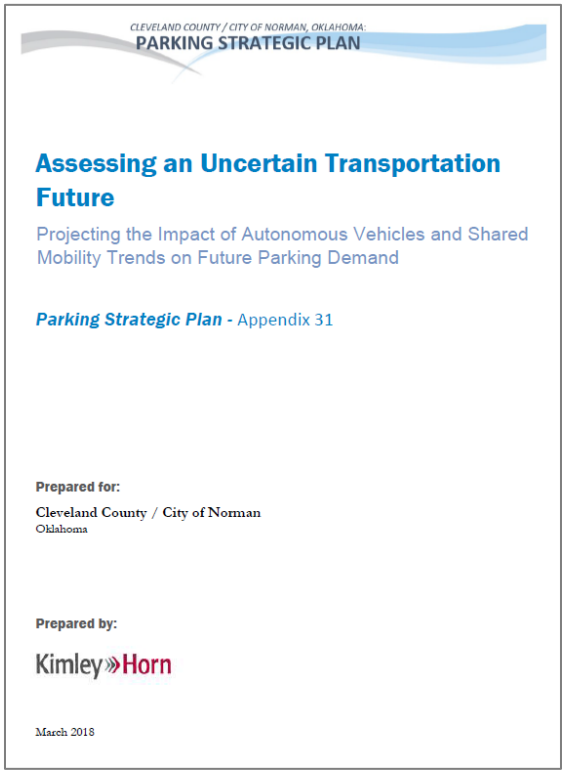
Most people would agree that the need for parking structures is not going to go away anytime soon, even as technology is rapidly changing. Parking may not be the most glamorous element

of a development or community but many community planners and developers recognize that when done right, it is the key to realizing their vision for an active and vibrant community and a successful development.

The service life of most parking structures is designed for 50-75 years. As such, these facilities are and will continue to be fixtures of our urban landscape. We realize that mobility options and preferences are going to change over time as are the needs of the community. The last thing anyone wants is to build an expensive infrastructure element that will be obsolete or severely underutilized.

What if parking structures could be designed to not only handle the current need but also be adaptable to better meet the evolving parking/transportation and land use needs of communities in the future? What if we could 'future-proof" the parking structure of today and design them to be adaptable to become say a community mobility hub, a community event center, or other land use types (office, clinical space, residential, etc.). Can this be done physically and economically?

The appendix document entitled, "Assessing an Uncertain Transportation Future – Projecting the Impact of Autonomous Vehicles and Shared Mobility Trends on Future Parking Demand" (Appendix 31) provides extensive research regarding autonomous vehicles as well as detailed information concerning the technical aspects of planning for adaptive reuse garages including sections on: preliminary code issues, prototype design concepts, opinion of probable cost for prototype concept designs and ideas related to phased parking development options.


CLEVELAND COUNTY / CITY OF NORMAN, OKLAHOMA:
PARKING STRATEGIC PLAN

Assessing an Uncertain Transportation Future

Projecting the Impact of Autonomous Vehicles and Shared Mobility Trends on Future Parking Demand

Parking Strategic Plan - Appendix 31

Prepared for:

Cleveland County / City of Norman
Oklahoma

Prepared by:

Kimley»Horn

March 2018

4. Community Engagement

Introduction and Task Goals

A critical element of developing a successful parking plan is clear and concise communication with various user groups, coupled with proactive and authentic stakeholder engagement. For the Cleveland County/City of Norman Parking Strategic Plan project, intentional and targeted outreach to the downtown Norman community was designed to provide both County and City staff, and the consultant team, with valuable insight into the real and perceived parking and transportation challenges that residents and visitors face when visiting the community.

The following chapter outlines the community engagement activities that were conducted as part of the Parking Strategic Plan, as well as a Strategic Communications Plan to support implementation of the plan's recommendations. The Strategic Communications Plan explores traditional and non-traditional marketing channels, education/engagement strategies, and communication vehicles specifically identified to keep the community informed and engaged during a time of growth and change in downtown Norman. The Strategic Communications Plan also identifies target audiences for marketing, messaging strategies, and positioning statements with the ultimate goal of increasing ease of use and customer understanding of the parking options that the County/City of Norman has to offer.

The goal of this task was to provide the City and County with a specific roadmap for developing a new communication and outreach strategy that will keep members of the downtown Norman community informed and engaged throughout implementation of the Parking Strategic Plan's broader recommendations.

Stakeholder Conversation Summary

In December 2017, a Stakeholder Consultation Strategy was developed to support Cleveland County's Parking Strategic Plan by:

- Introducing the project to community leaders, stakeholders, and general public
- Placing parking, transportation, and access management into the larger context of economic and community development
- Listening to and documenting the stakeholder feedback, concerns, and suggestions

The main goal of the stakeholder consultation process was to provide community members with an opportunity to share their experiences, perceptions, ideas and concerns related to parking in and around the downtown area. A full overview of the Stakeholder Consultation Strategy can be found in this chapter, below.

Two main stakeholder consultation site visits were conducted as part of this project. The first took place during the project kick-off meeting and the second took place December 5 - 6, 2017. In total, over 20 unique stakeholders participated in outreach meetings, including representatives from the following groups, organizations, and businesses:

- County Commissioners

- City of Norman Staff
- Downtowners, Campus Corner and EDAB
- Chamber of Commerce, Economic Development Coalition and Arts Council

Extensive notes were taken at all stakeholder meetings and that feedback was carefully analyzed to identify key themes and the most frequently mentioned stakeholder comments. The result of that analysis is detailed in the following section.

Introduction and Task Goals

Stakeholder consultation is an invaluable, yet often overlooked, part of parking strategic planning. As the breadth and complexity of consultation work is largely driven by community appetite and project scope, the Kimley-Horn team worked with representatives from ADG to define and conduct a succinct stakeholder process to complement the Cleveland County / City of Norman Parking Strategic Plan.

The purpose of this chapter is to outline the stakeholder consultation process and findings, as well as to provide recommendations on how to keep key project and community members engaged as the parking strategic plan recommendations are implemented.

Stakeholder Consultation Process

Consultation was conducted via in-person meetings, in either an individual or small group format. All stakeholder meetings were facilitated by Kimley-Horn and each meeting followed a similar agenda to ensure that all stakeholders received similar information about overall project goals and the purpose of the stakeholder consultation process.

- Welcome, Introductions & Sign-in
- Brief Overview of Project Scope, Deliverables & Timing
    - Work completed to date
- Stakeholder Consultation Process & Goals
- Proposed Questions
    - What is working well with how parking is managed today?
        - Name 1-2 positives
    - What are the most pressing issues related to how parking is managed today?
        - Name 1-2 challenges
    - Describe your vision for what the parking experience of the future looks like in downtown Norman.
    - What do you think are the biggest roadblocks to achieving that future vision?
    - Who needs to be "at the table" for this vision to be achieved?
    - What does success look like for this process?
- Wrap-up & Next Steps

Key Themes: Opportunities and Challenges

Several strong themes emerged from both the in-person consultations that were held in March 2017 and December 2017. While many of observations and findings gathered during the site visits will be covered in Chapter 5 of the Parking Strategic Plan, the following observations were key themes throughout the stakeholder engagement process.

Stakeholder Priorities & Key Themes

During the stakeholder consultation process, extensive notes were taken by the consulting team and categorized by theme to determine which comments were raised most frequently across all conversations. This qualitative analysis provided the foundation for the TABLE 1 which highlights the common priorities that were mentioned throughout the consultation meetings.

As not every comment or suggestion made during the stakeholder process rose to the level of a Stakeholder Priority, notes from each stakeholder session are available upon request.

TABLE 1: STAKEHOLDER PRIORITIES

Color Coding:

Green = "Most Frequently Mentioned"

Yellow = "Frequently Mentioned"

Orange = "Mentioned a Few Times"

PRIORITIES	ADDITIONAL DETAIL

Consistent On-Street Parking Management	• Consistency and/or coordination across various areas of the City's core (i.e., downtown, Campus Corner):
	  ○ Meter technology
	  ○ Rates
	  ○ Hours of operation
	• Effective and reliable enforcement

Accurate Budgeting & Financial Management	• Consistent and transparent financial tracking • Budgeting • Asset definition • Consideration of a system-wide approach to asset management and alignment of revenue streams and expenses (i.e., on-street, off-street, special event, enforcement)
Integration with Alternative Modes	• Increased emphasis on walkability and "bikeability" • Acknowledgement of changing transportation preferences for younger generations (i.e., Millennials) • Increased proliferation of shared mobility offerings (i.e., Uber, Lyft) • Enhanced mass transit / bus service options (coordination with Regional Transit Authority, future Bus Rapid Transit)
University of Oklahoma's Role as a Key Partner	• Coordination of technology applications (i.e., meters, pay by phone/app) • Parking management within the neighborhoods surrounding campus • Coordinated and consistent enforcement

Intentional and Coordinated Education, Communication & Messaging	• "Cultural shift" from mentality of "free parking at the front door" to a more actively-managed solution • Coordination and partnership between the City, County and community partners (i.e., Campus Corner, Downtowners, OU) • Communication about parking options for residents, employees and visitors
Shared Parking Opportunities	• Identification of underutilized resources • Maximize existing investment
Impacts of Current Land Use, Code Requirements & Increasing Density	• Impact of current form-based code • Parking minimums and maximums • Unique land use patterns / density between districts (i.e., downtown vs. Campus Corner) • Impact of areas designated for Transit Oriented Development
Need for a Well-Defined Organizational Structure & Management Model	• Specific recommendations regarding organizational model (i.e., City or County department, outsourced / third party, hybrid approach) were found lacking in previous parking studies • Options are preferred; paired with specific recommendations from the consulting team • Definition of
Education about Employee Parking Options	• Definition of specific and viable options • Communication / messaging about impact of employees parking on-street
Consideration of District-Based Parking Management Strategies	• Understanding the unique characteristics and parking/access behavior by district and activity node

When viewed comprehensively, feedback received from the stakeholder consultation process supports three, "big-picture" themes:

1. **Consistency, consistency, consistency:** The most frequently mentioned comment across all stakeholder meetings was the desire for a consistent and coordinated approach to parking management across downtown, Campus Corner and in the areas adjacent to the University of Oklahoma campus. Stakeholders commented that it would be helpful if residents of and visitors to the City of Norman experienced consistent parking meter technology, and a coordinated approach to pricing, signage and enforcement. Additionally, the desire for a collaborative approach to communication about parking options – across these complementary areas/districts – was seen as an important strategy to help manage expectations as Norman continues to redevelop and grow. Strategies for how the community can take a proactive approach to communications and customer education is included in this chapter.

2. **A comprehensive and actively-managed approach to parking:** The stakeholders who participated in this consultation process also expressed the expectation that the final Parking Strategic Plan would provide actionable recommendations on what management structure would work best to support the Cleveland County Master Plan

and other similar community-visioning planning documents. Stakeholders indicated that the lack of a specific recommendation on organizational structure was one of the main areas where previous parking study had fallen short. Both City of Norman and Cleveland County representatives indicated a desire to have the Parking Strategic Plan include information on all viable organizational models available, paired with a specific recommendation from the consulting team on the best options for Norman.

3. **Integration with and consideration for a multi-modal future:** The third key theme mentioned by stakeholders was the desire for a downtown core that supports a more multi-modal approach to parking and access management. There was a strong desire for options expressed during the consultation process – from increasing the walkability and "bikeabilty" of the city's core to coordination with regional and statewide partners to encourage investment in mass transportation alternatives like Bus Rapid Transit (BRT). This particular theme also takes into account the demographic make-up of a college town like Norman. With the Millennials and Generation Z showing a preference for delayed vehicle ownership and ride-sharing alternatives, it is important to plan for improvement in the parking and transportation experience both today and in a somewhat unknown (but rapidly-approaching!) future.

These three themes, along with the supporting detail provided by the priority matrix above, served to both inform and validate recommendations made as part of the Cleveland County / City of Norman Parking Strategic Plan.

Stakeholder Education and Communication

Some of the best parking and transportation communications programs share a common, yet unique characteristic: a strategic and unwavering commitment to ongoing stakeholder education and communication.

Through Kimley-Horn's work with many of these top programs, we've developed a four-step process to complement implementation of parking strategic planning efforts. This process includes:

1. Discovery
2. Branding & Visioning
3. Work Planning and Implementation
4. Performance Evaluation

Each step is critical, informing the next one and offering a complete picture of where a program is today, where it could be tomorrow and the variety of paths available to get there.

Step One: Discovery. While only some organizations have the ability to conduct costly market research and stakeholder outreach efforts, every organization – even those on a small budget – can take steps to better understand their current environment, including attitudes and perceptions of current and future customers. Research can be as simple as gathering existing articles, studies, and information that help create the foundation for an effective communications plan. Often, a parking and transportation organization can identify key issues, audiences, sensitivities, competitive products, and/or policies that might affect their future communications and marketing efforts.

More sophisticated approaches to research (commonly referred to as "market research") are generally divided into two major categories: quantitative and qualitative. Quantitative research is broader in scale and can be used to generate data and usable statistics. An online survey or poll of stakeholders (i.e., current and/or potential customers) is considered quantitative research. Quantitative research activities can provide an important benchmark that helps define what a customer, patron and community partner currently knows or believes about a parking or transportation organization's offerings, programs and/or function.

Qualitative research is more exploratory and can help identify the underlying reasons, attitudes, perceptions, and language used by people when discussing a problem, program, or issue. Hosting one-on-one interviews or a series of small focus groups with stakeholders (as was completed as part of this study process) are both examples of qualitative research.

Step Two: Branding & Visioning. When a community is looking to develop a comprehensive parking and transportation organization for the first time, investment in organizational visioning and branding may be viewed as ancillary or "extra" rather than of critical importance. However, thinking strategically about the ways in which a parking program is (or is not) communicating with its customers and the community can support (or detract from) every other aspect of a parking program's operations.

The key elements of an organizational brand platform include:

- **Branding:** In the parking and transportation industry, branding is much more than just a logo, a sign on the door or even the color and condition of employee uniforms. Branding is the image that customers have of an organization; it is an "unspoken promise" of quality and level of service that customers can expect when interacting with an organization.

- **Vision:** This statement should be aspirational and speak to the organization's ultimate point of success (where you want to go, not where you are now).

  Key questions to ask when formulating a vision include:

  1. *How would you define your ultimate point of success?*
  2. *What umbrella task/goal do you possess that will be worked on indefinitely?*

- **Mission:** This statement defines what an organization is, why it exists, and its reason for being (it's more tactical).

  Key questions to ask when formulating a mission include:

  1. *What will you do (specifically) to continuously work towards your vision?*

- **Audience(s)**: While every unique communication effort doesn't have to be tailored to meet a specific stakeholder group's needs, it is important to keep in mind that communication—especially during tense or challenging times—isn't a "one size fits all" solution. Audience identification can help a parking program know when additional communication, or an explanation of a situation, might be needed. It also helps to prevent overwhelming customers with irrelevant or too much information. The more parking managers understand their audiences (i.e., customers, community) – what is important to them, what they read, how they process information, who they are

influenced by – the more tailored a communications and/or marketing effort can ultimately be.

Key questions to ask when identifying your various audiences include:

1. *What markets are you serving?*
2. *What benefit do you offer them by working towards your vision?*

- **Messaging**: The foundation for creating content and tone for marketing and customer education efforts. Messaging for a parking and/or transportation organization should focus heavily on how the program will work to align parking and mobility policies and activities with the community's strategic development and growth goals. When crafting key messaging for public education and communication about a parking or transportation program's operational and customer service enhancements, it is important to carefully consider the tone of the messaging and how various messages will be perceived by the general public. In an arena as technical and complicated as parking management, it is a common pitfall to attempt to convey too much information at once, or communication with heavy jargon or technical instructions that will not resonate with the intended audience.

  Key questions to ask when formulating a messaging platform include:

  1. *What perceptions, habits, or beliefs do we need to work on or develop in order to grow?*
  2. *What are we in the business of "selling"; or in other words, what are our main product and service offerings?*

Step Three: Work Planning & Implementation. The exercise of developing a written communications plan cannot be underestimated. A plan can provide clarity, define a common direction for employees and can encourage buy-in from organizational leadership.

A high-level sampling of activities that could be included in a parking or transportation organization's annual work plan include:

- **Goals:** A simple and concise outline of what success looks like. Goals can be stated more broadly and be more visionary or aspirational.
- **Objectives:** Specific accomplishments and/or milestones that are ideally, stated in a measurable way.
- **Digital marketing.** Digital marketing is a general term to describe online marketing and includes websites, email marketing, mobile apps, and paid advertising. In any marketing effort, a website should be considered the most tangible public-facing representation of a company, and one of the most important. An organization's website must be easy to find and regularly maintained to keep content fresh and new. Users returning to the site and finding nothing new are likely to stop utilizing it as a resource. In addition to hosting static content, the site should include tools to allow users to select how they want to communicate with/receive information about upcoming changes that will impact parking in the downtown area. Webpages should offer a mobile-optimized version for those who wish to access the site on mobile devices. Social media is a subset of digital marketing.
- **Social Media:** Social media has changed the way people communicate, how stories are told, and how information gets distributed. However, as many industries are noticing, social/new media strategies are only as effective as the consistency of the staff, intern, or

volunteer time that is spent to maintain them. The effective use of social media means making a commitment to keeping it updated and fresh with content. The most successful parking programs and organizations using social media are creative in their messaging and approach, using the site not just for information, but also for contests and fun interactions. Social media gives the brand a personable and down-to-earth accessibility that gives a user a continuous reason to keep coming back.

- **Customer Programs:** Municipalities are using loyalty programs to incentive parking patrons to utilize underutilized facilities. This provides the customer with financial incentive and opens the more convenient, higher demand parking facilities up to those willing to pay a premium or needing the more convenient facilities to accommodate their various needs.
- **Multimedia Campaigns:** Telling an organization's story consistently across a variety of mediums and materials (i.e., videos, infographics, print and digital) is a hallmark of successful parking and transportation marketing programs. Gone are the days when a simple brochure or public service announcement would be sufficient. Customers expect their service providers to be where they are (online) and to communicate in short, digestible formats that are accessible "on the go".
- **Community Relations.** Developing goodwill within the community can benefit an organization on multiple levels. The main principle of community relations is accepting roles and responsibilities as a good neighbor and good corporate citizen that listens and cares about the well-being of community. Community involvement can encompass everything from sponsoring local charities or school sports teams, rewarding employees for volunteering with local groups, or place-making for community benefit. Incorporating social responsibility as part of communications planning is increasingly an essential part of good business.
- **Special Events**. Sponsoring a community program or fundraiser, launching a "donations for citations" program, or hosting a parking meter art contest are all examples of special events that can be components of a communications plan. Special events can work on many levels to achieve positive visibility for an organization by reaching a far broader audience than just event attendees – and in some cases creating news and photo opportunities that translate to positive media coverage.
- **Crisis Communications.** Preparing for a crisis is a critical element of any organization's public relations' planning. It is important to be prepared with a plan that includes clearly-defined protocols and coordinated statements, and often a pre-identified, trained spokesperson. The three most important rules in a crisis are to know the facts, tell the truth, and tell it fast. Crisis communications experts used to always talk about the golden hour – that first hour after a crisis before the media start calling. Today, that hour is a millisecond because chances are someone already knows about the incident and has tweeted it, posted it on Facebook, or sent out a video. By telling the truth and telling it fast, a parking professional can get ahead of the crisis, display openness and transparency, and minimize damage to the organization's reputation.
- **Partnerships and Alliances**. The use of strategic partnerships, alliances, joint programs, or endorsements with companies, brands, or organizations that share or are relevant to an organization's mission can often be a way to reach your target audiences effectively. For some marketing efforts, the distribution of messages or materials through a partner can be the best (and most affordable!) path to achieving an organization's communication goals.

Once you have a plan, the "real" work of implementation begins; and as with any project, it is inevitable that course corrections and adaptations may need to be made. As the plan unfolds,

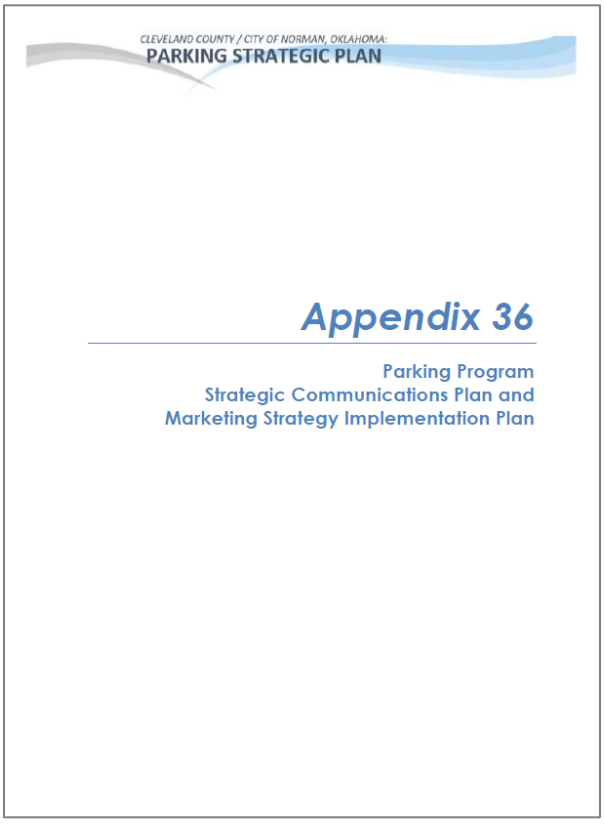
new opportunities and/or challenges will likely arise, and the plan should be flexible enough to take new developments (or areas of organizational focus) in stride. As mentioned in the previous section, your plan may include the development of an organizational brand, which might lead to the need for a new logo or visual presence, an updated website and supporting visual materials that ranging from brochures to enforcement vehicle wraps. It is in the Implementation Phase you'll be assigning tasks to specific staff or contracted vendors, creating a timeline, transitioning your planning efforts into an annual work plan and defining a budget.

Some communications and marketing efforts can be accomplished on a limited budget, making use of existing staff and community partner resources. Others will require a more significant investment that might include hiring outside marketing expertise, graphic design, printing or video production, paid media, spokesperson training, and/or elaborate special event expenditures. Budgeting for communications and marketing work – from research to implementation should be done annually as part of a parking and/or transportation program's annual budget process.

Parking Program Strategic Communications Plan and Marketing Strategy Implementation Plan

Regardless of whether an organization is budgeting for dollars, staff time, and/or scarce resources, strategic investment in marketing and communications often slides to the bottom of the list. However, in reality, thinking strategically about communications, public education, and media relations decisions can support every other aspect of a parking and transportation system's operations.

Appendix 36 - Parking Program Strategic Communications Plan, highlights opportunities to proactively engage key user groups in policy and programmatic decisions that will impact their experience accessing downtown Norman.



The strategies have been divided into three categories:

- Program brand development, messaging, and key audiences: Ways to build connection, pride, and ownership among staff and users.
- Media Tools and Platforms: Strategies to build the organization's narrative via consistent and creative communication, utilizing the most effective tools. Implementation
- Framework: How to organize the various elements of your plan for practical implementation and progress tracking.

In addition, a specific "implementation plan/matrix" is provided in this appendix. The implementation matrix aims to provide guidance on short-, mid- and long-term

implementation recommendations for communications, marketing and stakeholder engagement efforts.

Strategies correspond with categories listed in the previous sections and are coded for ease of reference as follows:

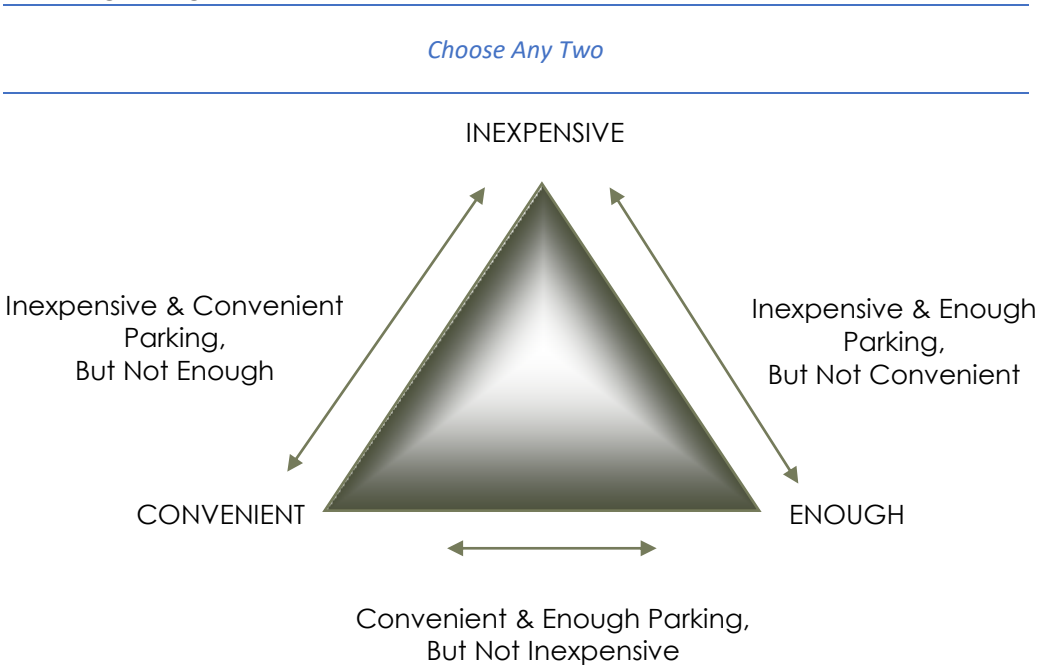
- Web Presence (Web)
- Social/New Media Tools (Social)
- Additional Tools and Tactics (Tools)
- Public Relations (PR)
- Staffing and Staff Development (Staff)
- Annual Communications, Marketing and Stakeholder Engagement (Engage)
- Media Relations (Media)
- Visual Identity (Identity)
- Metrics (Metrics)

5. Recommended Parking Program Organizational Structure

There is one element common to every study and every downtown - parking always seems to be a source of frustration and contention. It is amazing how emotional an issue parking can be. This is because it affects people so directly. Think about it – how many other areas involve issues of personal safety/security, finance, convenience, wayfinding, accessibility and customer service? Because parking creates the first and last impression of your community, one question we will address is: How can that "parking experience" best be managed? We'll get back to that question shortly.

An interesting truism about parking is illustrated in the graphic below.

Figure 5.1 Parking Triangle



Everyone wants three things when it comes to parking:

1. They want there to be plenty of it
2. They want it to be very convenient and
3. They want it to be inexpensive (preferably free)

Unfortunately, you can have any two, but not all three of the elements above. This ushers in the need for a policy decision. If you choose to have ***inexpensive and convenient*** parking you will likely not have enough. This option may be acceptable if you want to use the lack of spaces as part of a demand management strategy to encourage the use of transportation alternatives.

If you choose to have ***inexpensive and enough*** parking it will not be very convenient. With this choice, you may be adopting a strategy that utilizes less expensive remote parking supported with shuttle operations (at least for employees).

If you choose to have ***convenient and enough*** parking, it will not be cheap. This often-preferred approach typically means you have chosen to develop structured parking. The national average cost to construct a surface lot parking ranges from $5,000 to $8,000 per space. Above grade parking structures average between $18,000 – $30,000 per space. Below grade parking can range between 1.5 to 2 times the cost or more of above grade structures dependent upon soil conditions and other factors. Another consideration that is often over looked is that operating, utility, maintenance and security costs are significantly higher with structured parking.

In urban environments, the choice is most often made to have "convenient and enough" parking. This strategic decision and the significant capital investment it requires, creates the need to assure that these investments are well managed and responsive to the communities they serve.

Based on our work evaluating numerous parking systems of various sizes and complexity across the country, Kimley-Horn has identified a set of 20 Characteristics, that when combined into an integrated programmatic approach can provide the basis for a sound and well managed parking system. We've found that the twenty characteristics provide a solid foundation for communities who are working to manage parking in a way that balances convenience, availability and cost.

The 20 Characteristics include all the elements in the list to the right.

A parking system that has all twenty of these characteristics is well on its way to being in a class apart from the majority of parking systems. The ultimate goals are a system that provides professional management, understands the role it plays in contributing to the larger objectives of the downtown or shopping district and is responsive to the community to which it serves.

Parking System Operating Methodologies

There are three primary methodologies for operating parking programs. These are:

1. Self-Operation – The managing entity or owner operates the parking program itself. For example, a downtown parking authority could hire the necessary staff to operate the parking system internally.
2. Outsourced – Management Contract – The facility owner or managing organization contracts a private parking management firm to handle day-to-day operations and maintenance through a management contract. Through the management contract, the private parking management firm is either paid a fixed management fee and/or a percentage of gross revenues and is reimbursed by the owner for all costs incurred in the operation.
3. Outsourced – Concession Agreement – The facility owner or managing organization contracts a parking management firm to assume full responsibility for all aspects of the operation, including expenses, and the parking management firm pays the owner a guaranteed amount and/or a percentage of gross revenues (or a combination).

A variation on these basic methodologies that is just being introduced in the US parking market is that of parking system "monetization". A more detailed description of each option is provided in the following sub-sections.

Self-Operation

Self-operation of the parking system requires that the owning entity provide all the necessary employees (i.e., full or part-time staff and/or temporary employees), equipment, supplies, etc. With this method of operation, the owning entity receives all gross parking revenues and pays for all operating expenses. Self-operation requires internal administrative and managerial staff at a higher level than the management contract or concession style agreements.

Self-operation allows the owning entity to have complete control over the parking facilities and the level of service provided to its patrons. This requires a well-trained and experienced staff to effectively manage a large parking operation with significant daily revenues. Parking has become a highly specialized field and also requires good general and facility management skills. Without proper training and professional development, self-operation can result in a lower than desired level of service and revenue controls. This, in conjunction with the requirements for a high level of customer service and the specialized nature of parking, makes the idea of using a professional parking management firm a logical and attractive alternative for initial downtown parking operations.

Potential advantages of self-operation include:

- Complete control over day-to-day parking operations, including customer service.
- Internal parking knowledge to assist with future planning.
- Uniform look and feel with other County/City services.
- Better control over staff and staff training.
- Eliminates paying a management fee to a vendor

Disadvantages to this approach would include:

- Typically, higher expenses than contracting with a private parking provider due to:
- Higher pay rates than private operators especially in a unionized environment
- More restrictive benefit requirements
- Higher staff training and development costs
- Private operators have a greater economy of scale relative to supplies
- Higher insurance costs/requirements
- More operational duties for the County/City
- Smaller staff pool to draw from for covering sick days and vacations
- Without adequate training, customer service could suffer
- The County/City would need to find and hire experienced parking staff
- The County/City would have higher administrative and back office costs than an experienced private operator
- The County/City would deal directly with customer complaints
- The County/City would assume all of the financial risks related with the parking system
- Can be more difficult to terminate the employment of staff when needed

Management Agreement Operations

In this form of operation the owning entity retains complete control over staffing levels, validation policies, parking rates, and customer service policies. With a management agreement, the parking operator provides the necessary labor and services for the operation of the parking facilities in accordance with agreed upon policies and annual operating expense budgets established by the owner. The parking operator then receives a monthly payment, either a lump sum amount or a percentage of the gross or net revenue. This monthly payment represents the fee to manage the facilities.

The parking operator should provide the owning entity with a detailed monthly report package including: operating statistics, revenue summaries, expenses summaries, budget variance reports, etc. The management agreement still requires some additional personnel time for the owning entity's staff, since it is necessary to audit the gross parking revenues, as well as the monthly operating expenses. The preferred arrangement is that all reporting guidelines and accounting practices are determined up-front so that each party understands their responsibilities.

The owning entity's stakeholders and staff should have significant input into establishing the "level of service" for the parking system by deciding on the type of parking access and revenue control systems to be employed, the quantity of cashiers/customer service ambassadors, acceptable traffic queuing upon exit, lost ticket/insufficient funds policies, parking related

services offered (lost vehicle assistance, dead battery assistance, vehicle lock-out assistance), etc.

The following outlines the potential advantages of outsourced day-to-day operations via management agreement (in conjunction with a small in-house contract management function):

- Reasonable control over day-to-day parking operations
- An internal parking manager could be hired by the County/City with sufficient parking knowledge to assist with future planning
- A well-structured management agreement would provide:
    - Reasonable control over staff and staff training
    - High customer service expectations
    - A high level of staff appearance
    - Strong auditing capabilities
    - Operator accountability
    - Parking services from an experienced service provider
- Typically, operations are less expensive due to:
    - Lower staffing costs
    - Lower supply costs
    - Lower training costs
    - Lower administrative costs
    - Lower insurance costs
- The use of a private parking operator, at least for a short time, would provide valuable parking experience to the County/City
- Potentially, a large pool of private operator staff to draw from for sick day and employee vacations
- The contracted parking operator would deal with most customer complaints
- Relatively predictable parking system expenses
- Potential disadvantages to this approach include:
    - The County/City would have to compensate a private operator with a management fee or a percentage of gross revenues
    - Somewhat less control over day-to-day operations
    - Somewhat less control over staffing and training issues
    - The County/City would need to find and hire an experienced parking manager
    - The County/City would have some administrative and back office staffing costs

- The County/City would assume most of the financial risks related with the parking system

Concession Agreement Operations

With a concession agreement, the concessionaire will provide all necessary labor and services for the complete operation of parking facilities in return for a percentage of the gross parking revenues. The actual percentage varies from operation to operation based on the size, complexity, revenue potential, and perceived risk to the operator. There may be a guaranteed minimum annual payment to the owning entity. Sometimes a revenue split is negotiated for revenues above a certain level.

In general, concession agreements work best in situations where the owning entity wishes to divest itself from the day-to-day parking operational concerns in order to better focus on its core business (these types of arrangements are more common in airports for example). With this type of agreement, a minimal amount of time is required by the owning entity's staff in the day-to-day operations of the parking program. The owning entity also gives up some level of control as it relates to defining day-to-day operations, as the concessionaire is responsible for all expenses and most liabilities. Typically, the owning entity receives a deposit from monthly parking revenues within two weeks after the end of the each calendar month. Periodic conversations with the parking operator are necessary to discuss operational issues that affect the quality of service to owning entity's patrons.

The concession agreement is the simplest type of agreement for administrative purposes, in that only the gross parking revenue need be audited. All operational expenses are the responsibility of the concessionaire, thereby resulting in minimal control of this function by owning entity staff. Also, as with the management agreement, the parking operator serves as a buffer to the owning entity's management with respect to parking complaints and potential wrongdoing by those employed within the parking system.

Potential advantages of concession style leasing of parking facilities include:

- No real parking operations or management required by the County/City
- No substantial daily auditing required by the County/City
- Facilities would be leased to an experienced parking services provider
- Requires no internal parking experience on the part of the County/City
- Relatively predictable revenue stream
- Less operations related financial risk
- Parking operator takes all significant parking customer complaints

Potential disadvantages to this approach would include:

- Little to no control over day-to-day parking operations
- No control over staffing and training issues
- Less customer service accountability

- Difficult to measure parking system expenses, if the parking operator is required to share them at all
- The parking operator may be encouraged to reduce facility expenses to a minimum level (negatively impacting customer service), to increase profits

Parking System Monetization (or Privatization)

This option, which is also sometimes referred to as "Public-Private Partnerships" or "PPPs"(there are other types of public private partnerships that do not involve monetizing public assets and so we will focus on the term "monetization") is very similar to the concession agreement approach described above with the exception that the term is much longer and the owning entity receives a large cash infusion at the front end of the deal which is then paid back (with significant finance and other fees) over the term of the lease.

Parking System Organizational Models

Enhancing and expanding the scope of the current parking system is an important element for enhancing the overall experience of Cleveland County and the City of Norman, OK. Well-managed, customer-oriented parking facilities encourage visitors to shop, work, and explore local cultural and entertainment options by improving access to area attractions, reducing traffic congestion, and clearly informing users about regulations and fee structures associated with available parking. The creation of such a system will support commerce; promote the County and City's transportation, sustainability, and traffic mitigation goals; and advance the broader objectives of economic development and regional vitality.

This report examines several effective parking management operational methodologies and organizational frameworks that could serve as models for the implementation of a County/City managed parking program.

Parking program reorganizational initiatives are often the result of larger community-wide strategic or transportation plans or downtown master planning projects. Parking issues can also be identified when business districts implement retail enhancement strategies. Regardless of the catalyst, parking initiatives often share a set of core goals and priorities that emphasize the need to address the needs of multiple constituencies, support the development of a vibrant community, and provide safe, user-friendly parking facilities that balance public needs with private interests. All of this must be accomplished in consideration of funding mechanisms and strategies that will benefit the community in the long-term.

Parking System Organizational Frameworks

Parking management best practices, from a program organizational perspective, center on the concept of a "vertical integration" of parking functions. This contrasts with the typical "horizontally fragmented" organizational structures that tend to evolve naturally in many municipal parking organizations across the U.S.

Horizontally fragmented systems are defined by the compartmentalization of parking functions and responsibilities, such as on-street parking, enforcement, and parking structures, among multiple, disparate departments or entities. The police, facilities management, public works, development authorities, finance departments all may play a role, yet no singular entity has

responsibility for, perspective on, or understanding of all of the interrelated functional areas that comprise a parking system. In this scenario, there is no overall accountability for parking. Or put another way, parking is everyone's part-time job, and no one's full-time responsibility.

In a vertically integrated system, parking is managed as a single cohesive system. At a minimum, one entity manages on-street parking, off-street parking, and parking enforcement. More advanced models include parking/transportation planning, transportation demand management programs, and, in some communities, transit system management. Vertically integrated systems can be self-managed or management can be outsourced/contracted via management or concession agreements. As the parking profession has evolved, several very effective parking system organizational models have emerged. Each of these models has its own strengths and weakness depending on several factors including the parking system's size, degree of development, programs offered, political landscape, community goals, etc. The five most successful and commonly utilized organizational models are:

- A Consolidated ("vertically integrated") County/City department model
- The Parking Authority model
- The "Contract" or Business District/DDA model
- The Parking District/Commission model
- The Professional Services model

There are of course several variations and hybrids of these models, but these are the five primary alternatives commonly seen across the country. Each of these models will be detailed in more depth in the following sections, but they all have one common factor that contributes to their success: They all address the major problem associated with the "horizontally integrated model" previously described.

When evaluating which organizational option will work best in a specific community, it is important to ask community stakeholders to create a prioritized set of evaluation criteria. A typical list of criteria would include determining which organizational option:

- Best supports economic development
- Best reflects the image and personality of the community
- Is most efficient/cost effective
- Is most customer-friendly
- Is most politically feasible
- Is most focused on the vision
- Is easiest to achieve
- Is most responsive to businesses and stakeholders
- Is most financially viable
- Provides the most effective coordination

- Provides needed parking management expertise
- Best promotes long-term growth
- Facilitates Intergovernmental coordination
- Supports the principle of "Vertical Integration"
- Facilitates downtown re-branding / Integration with downtown master plan goals
- Promotes alternative transportation and multi-modal transportation options
- Fosters innovation and mission broadening
- Effectively identifies and engages with local "community champions"
- Ability to recruit or develop the best possible program leader

The following is a brief description of parking system organizational models that have shown demonstrated success in recent years. Each description is illustrated by an example of a specific program based on that model.

Consolidated ("Vertically Integrated") City or County Department Model

A Consolidated "Vertically Integrated" City or County Department Model is essentially a typical government department – lead by a department head and consisting of a varying assortment of support staff. The defining characteristic of this model is that the department director has complete responsibility for the management of all parking related program elements. The primary elements of these being:

- Off-street parking facilities
- On-street parking resources
- Overall program financial performance
- Parking system planning
- Parking enforcement

There are numerous other related areas that can be included:

- Transportation demand management (trip reduction programs, preferential parking for car/van pools, transit programs, etc.)
- Parking system branding, marketing, and community outreach
- Implementation of new technologies
- Parking system planning (i.e., zoning, financial planning)
- Residential permit parking programs
- Interface with downtown development and economic development

The City of Fort Collins, Colorado has a consolidated parking management program that incorporates off-street parking (parking structures and surface lots), on-street parking (time limited on-street spaces), and parking enforcement. The City's Parking Manager has developed a program to promote effective coordination and collaboration with the owners of private

parking to better support evening restaurant parking demands and for special events. Another feature arising from this integrated approach is that the City is currently embarking on a parking technology assessment.

A key feature of this assessment is to identify technology options that could link on-street/enforcement systems (Auto-Vu LPR enforcement technology/T-2 systems software) with the next generation of off-street parking equipment and potentially new on-street multi-space meters. This type of creative and integrated thinking is more common in systems with a vertically integrated organizational structure.

The Parking Authority Model

Parking authorities typically operate with a small staff and engage a private parking operator to manage day-to-day operations. One advantage of the Parking Authority model, especially in a municipal setting, is that it puts all the major parties at the same table. This helps stakeholders gain a deeper appreciation for the competing agendas between various constituents.

The defining characteristics of a Parking Authority Model include:

- It has a defined mission and vision
- It is governed by a detailed management agreement
- Often has bonding capability
- Most often has responsibility for all aspects of parking operations (off-street, on-street, and enforcement)
- It is typically headed by a President or Executive Director
    - Because of this they tend to attract the highest caliber parking management personnel
    - The President or Executive Director reports to a board (typically 7 – 15 members)
    - The board is comprised of influential and invested downtown stakeholders

Board composition typically includes:

- High level County/City staff
- Mayor or City Manager (or appointee)
- Director of Finance
- Director of Public Works
- Property owners/developers
- Downtown association members
- Chamber of Commerce representative

- Large downtown employers

Although the authority may not control all of the parking in a downtown area, that does not mean they cannot affect the entire downtown. In Toledo, Ohio, the Downtown Toledo Parking Authority (DTPA) so dramatically transformed the operations in its three facilities that all the other private parking operations were forced to follow suit. Now virtually all downtown parking facilities have attendants in new uniforms, customer service training for front-line staff, parking structure interiors are painted white, new customer friendly parking technologies and programs are being installed/instituted – all following the DTPA's lead.

The "Contract" or Business District Model

In a surprising number of communities across the United States, downtown business improvement districts or downtown associations are taking operational responsibility for parking. Similar to the Parking Authority Model, the Contract or Business District Model is governed by a well-defined operating agreement that sets specific expectations and limits on the use of parking assets. These contracts or agreements must typically be reauthorized every 3 – 5 years based on whether the defined contract goals were met. If reauthorized, it is not uncommon for new goals and program objectives to be set for the next contract period.

In Boise, Idaho the off-street parking program is professionally managed by the Capital City Development Corporation – the City's urban renewal agency. Through the aggressive use of tax increment financing combined with a strategy of leading other desired development with parking infrastructure investment, downtown Boise has become a national model of downtown resurgence.

Another example of this model can be found in Tempe, Arizona. The City of Tempe does not own any significant parking facilities and only a few small surface parking lots. In Tempe, the need for a coordinated parking system solution to provide a more user friendly experience for visitors drove the downtown organization – the Downtown Tempe Community, Inc. (DTC – now the Downtown Tempe Authority – DTA) – to create what amounts to a "parking management overlay" program. Working with the owners of the off-street parking assets, they created a parking system management plan. Through creative signage, a common parking validation program, and extensive marketing, they branded the parking system to such an extent that it appears that Tempe has a well-managed and comprehensive parking program, although they do not own all of the individual assets. DTA acts, in essence, as a private parking management firm. They manage all parking staff and programs themselves, and return all profits to the facility owners (keeping a modest management fee). The DTA also manages the City's on-street parking resources and reinvests on-street parking revenues back into the downtown.

The Parking District or Commission Model

The Parking District or Commission Model is slightly different than the previously defined models, but as mentioned earlier, the one common element of all of these successful models is the goal of a creating a "comprehensive parking management function" under the control of one leader/entity ("vertical integration").

The characteristics of a parking district or commission approach include:

- They typically have a defined area with set boundaries

- They are governed by a board or commission
- They may have a special assessment that applies to all properties within the district
- This revenue generally goes toward defined district improvements, but could be restricted to parking or transportation related projects
- They are generally run by an Executive Director or President (although some are run by City department heads)
- All revenues are collected and managed by the district for reinvestment in the district
- In some cases, if revenues exceed operational or capital program needs, the additional funds are returned to the City's general fund
- In other cases, the City assesses the district a fee based on a percentage of net revenues in-lieu of not assessing property taxes on the parking facilities. This money goes to the City's general fund
- Revenue sources typically include:
    - Special assessment revenue (if applicable)
    - Off-street parking revenue
    - Could include miscellaneous revenue sources such as: advertising (in parking structures), vending machines or retail space rental (mixed-use parking facilities)
    - Could also include special event parking revenue
    - On-street parking revenue
    - Parking enforcement revenue

Parking Districts have made some significant contributions to the communities they serve. For example, in Boulder, Colorado, the downtown and University Hill Management District/Parking Services can boast the following list of accomplishments (all paid for with parking district revenues):

- Funding of the Eco-Pass program - $700,000 for 2006
- This program gives all downtown employees a free bus pass and contributes to a 62% modal split among downtown employees (reducing parking demand)
- Repayment of a $3.4 million Mall Improvement Bond - $500,000/yr
- This is a good example of the parking program contributing to community economic development
- Payment of parking structure debt service obligations
- Parking district revenues fund the development costs of downtown public parking structures as well as all parking operating and maintenance costs.

- One of the more impressive parts of this program has been the leadership in defining appropriate design guidelines for parking structures. Only mixed-used structures are permitted
- They must incorporate street level retail and be architecturally consistent with the downtown fabric. Some have been multi-modal in nature – integrating transit functions with parking

The best example of a Parking Commission model is the Missoula Parking Commission in Missoula, MT. This program has been in place since the 1970's and lead by the programs director who reports to a five member commission.

The Professional Services Model

A more recently developed organizational model is the "Professional Services" model. In this model, a smaller more professional level parking services group is developed in conjunction with the outsourcing of day-to-day operations. While there are many potential variations under this category, the most successful variation involves a group that is primarily administrative in nature.

The management group is responsible for program elements such as: creating the vision and mission of the program, community outreach and program development (including assessment of new technologies, etc.), parking system planning, interface with economic development programs, interface with transportation system functions (including alternative transportation programs), contract administration, parking facility long-term maintenance program development, system financial administration/audit functions, and special projects management.

Parking operations are outsourced to a qualified parking management firm. Their responsibilities would typically include: off-street parking facility operations (cashiering services, pay-on-foot operations, etc.), daily facilities maintenance, security, etc. Some communities have extended these contract services to include the operation of on-street parking and parking enforcement programs including citation collections and management. For on-street and enforcement operations meter maintenance and collections, citation issuance, collections and adjudication can all be outsourced as well.

Another feature often used in conjunction with the Professional Services Model is the development of "on-call services agreements" for various types of consulting and professional services such as: engineering facility condition appraisals, technology assessments, revenue control system assessment and audits, etc.

The primary advantages of this model are that parking is managed by a lean group of management staff focused on key areas such as:

- Program Administration and Finance
- Audit/Revenue Control
- Contract Administration
- Special Projects

- Marketing/Branding/Communications
- Economic Development/Customer Satisfaction/Business Community Interface

Day-to-day operations are outsourced. This can have the effect of keeping a better focus on the strategic goals of the parking program without getting mired in the myriad operational issues that make up day-to-day management.

Communities beginning to implement this approach include the City of Beverly Hills, CA and the City of Lincoln, NE.

The Parking Management Collaborative Approach

As mentioned earlier, this approach was developed specifically to address the set of conditions that exist in communities that have chosen not to develop a significant off-street public parking system and therefore do not have much ability to influence the off-street parking market in traditional ways.

The Parking Management Collaborative approach is comprised of the following basic tenets:

- There is a demonstrated need to improve the ease of use and access to parking in the downtown, especially for occasional visitors.
- There is recognition that a comprehensive approach that will coordinate and integrate both on-street parking and off-street parking assets is needed to make the downtown more visitor-friendly.
- On-street parking assets will be better managed as a short-term parking resource with the primary management goal being to promote a high degree of turnover for the benefit the merchants and businesses that depend on an effectively managed supply of convenient short-term parking resources. A goal of maintaining an average on-street occupancy level of approximately 85% shall be key program goal/benchmark.
- Because the majority of off-street parking in the downtown is privately owned and operated, a collaborative approach to developing a downtown parking management strategy is needed. The primary objective of this approach is to develop what is essentially a "parking management program overlay" that will create a well-coordinated and marketed user-friendly parking system that will appear to the casual user as a public parking program.
- The key functional elements of this parking management overlay include:
    - Program branding and marketing
    - A comprehensive updated downtown parking and wayfinding program
    - A central parking and transportation information clearinghouse function
    - A special event coordination function
    - A significant parking and transportation planning function

- Coordination with community and economic development activities
- Management of City owned parking assets
- Coordination with the downtown association in support of downtown business needs

The Parking Management Collaborative will strive to promote superior, customer oriented parking programs and parking facility standards.

Parking planning and coordination will be important functions related to understanding and responding to both the current and future parking needs of uptown users.

The diverse needs of various user groups will be considered, including visitors, employees, employers, property owners and parking management firms, through active planning, coordination and communications.

The Parking Management Collaborative shall be considered an integral component of the community's economic development strategies and programs.

The following nine elements will be the primary strategies to be implemented by the Parking Management Collaborative:

1. Develop a parking system brand and marketing program
2. Create a web-based parking and transportation information clearinghouse. Become the central point for coordination of information related to parking and access options for the community
3. Promote the principles of balanced access for all travel modes, including vehicular, pedestrian, bicycle and transit, to meet community-wide goals
4. Focus on creating an excellent customer service orientation for all parking user groups - visitors, employees, employers, property owners, etc.
5. Develop an effective interface between public and private parking providers.
6. Work with parking management collaborative members to create high standards for safe, attractive and well-maintained facilities
7. Take an aggressive and proactive approach to community education related to parking and transportation issues and new program development. Be responsiveness to the needs of the diverse customer/citizen base
8. Actively coordinate with economic vitality initiatives, retail support strategies and other community and economic development programs
9. Develop a strong parking and transportation planning function and promote good urban design, shared parking, walkability and transit oriented development approaches to create a superior, people oriented urban center.

This approach needs only a small, but highly effective staff to be successful. The recruitment of an executive caliber program director with strong vision and excellent communication skills is essential for this strategy to succeed. The other key ingredient is to get buy-in from the major parking property owners. This is typically accomplished by recruiting them to be on the program's Board of Directors. In some cases where all the right individuals are already on the board of an existing downtown organization (especially if creating "yet another board" would be seen as an issue) this function could become an initiative of that organization.

One of the key values of have the major parking property owners engaged at this level is that this will lead to them directing the parking management firms they manage or hire to "get on-board" with this program. Engaging the parking management firms on another level can also be very valuable because of their detailed knowledge of conditions "on the street" and their knowledge parking management principles in general.

The first major city to employ this model is Charlotte, NC, where the collaborative was located, organizationally, in the business improvement district known as the Charlotte City Center Partners.

The Eco-District Model

Eco-District Initiatives are a comprehensive strategy to accelerate sustainable neighborhood development. The purpose of this overview is to clarify the value proposition, define performance areas, and outline an implementation strategy as it relates to adapting this approach to a parking and transportation program organizational framework.

At its heart an Eco-District is a neighborhood or district with a broad commitment to accelerate neighborhood-scale sustainability. Eco-Districts commit to achieving ambitious sustainability performance goals, guiding district investments and community action, and tracking the results over time.

A parking and transportation Eco-District approach would recognize technologies and strategies for enhancing district sustainability, such as energy and water management systems within parking developments, support for green streets, the promotion of resource conservation, etc.

In this case, since parking can be a significant revenue source, we envision parking revenues being dedicated first to supporting parking program operations, maintenance reserves, and technology upgrades, but once the parking program is well established and generating excess revenues that these resources would be invested in a variety of sustainability initiatives. Examples might include programs such as:

- Community bike programs – to support an overall "park once strategy"
- Car sharing programs – to support downtown residential development
- Pervious pavement installation and bio-swales as demonstration projects in City surface parking lots

It should be noted that the widespread deployment of these strategies has been slow to develop due to lack of comprehensive assessment tools, scalable project capital, and public policy support. The Eco-Districts Initiative focuses on removing these implementation barriers and creating an enabling strategy to accelerate neighborhood-scale sustainability.

The Eco-Districts Initiative is distinct from most green development strategies that focus on brownfield or greenfield development that are primarily led by master developers or public agencies. Instead, the Eco-Districts Initiative targets districts - at the intersection of buildings, infrastructure and people. This initiative would be "working upstream" of rating systems like LEED-ND to develop tools and strategies for engagement and project implementation.

Generally, the Eco-Districts approach brings together community stakeholders, property developers, utilities, and the City to solidify a shared sense of purpose and partnership through the following actions:

- Create an engagement and governance strategy to build community support, set priorities and act
- Develop an assessment and management toolkit to guide project development and track ongoing performance
- Implement sustainability projects through technical and economic feasibility analysis, assembly of project financing, and establishment of public-private partnerships
- Identify commercialization opportunities for companies to test promising products and practices
- Establish municipal policy and regulatory structures to support Eco-District development

In this specific application, the general goals above still apply, however because of our focus on parking and transportation functions there will be some variation and more specific applications. However, the broad-based nature of parking and transportation, the need for on-going stakeholder engagement and the larger economic development focus makes this application very appealing. Overall, transportation accounts for about 30% of the nation's carbon footprint. Organizing your parking program to have an explicit "eco-district" orientation would send a strong signal of the City's commitment to environmental progress.

Recommended Organizational Options

Kimley-Horn and Associates, Inc. assessed and ranked each of the major models described above. The table below summarizes our organizational options assessment:

Cleveland County / City of Norman - Organizational Model Analysis

		Integrated City/County District / Commission	BID/DDA Contract Management	Multi-Jurisdictional Parking	Professional Services / Out-Sourced	Hybrid Professional Services / Out-Sourced Mgmt.
	Status Quo	Model	Model	Authority Model	Mgmt. Model	Commission Model
Supports Economic Revitalization	1	8	8	8	8	8
Most Efficient and Cost Effective	4	7	6	5	8	8
Most Customer Friendly	2	6	6	6	6	6
Most Politically Feasible	2	8	3	6	7	8
Most Focused on Vision	2	7	5	7	7	8
Easiest to Achieve	8	6	4	5	5	7
Most Responsive to Business & DT Stakeholders	2	7	6	7	5	7
Most Financially Viable	8	7	4	6	6	8
Most Effective Coordination	2	6	4	6	5	5
Provides Needed Parking Management Expertise	2	5	5	5	9	9
Best Promotes Long-term Growth	2	8	3	9	7	8
Facilitates Intergovernmental Coordination	2	7	2	7	6	7
Supports the Principal of "Vertical Integration"	2	8	5	8	6	8
Facilitates DT Re-Branding / Integration with DT Master Plan Goals	2	6	3	6	6	6
Promotes Alternative Transportation and Multi-modal Transportation Options	1	5	2	5	4	5
Fosters Innovation and Mission Broadening	2	7	3	7	5	7
Effectively Identifies and Engages with Local "Community Champions"	2	7	4	6	4	7
Ability to Recruit or Develop the Best Possible Program Leader	2	6	3	8	4	6
Total:	**48**	**121**	**76**	**117**	**108**	**128**

Legend
Consultant ranking of estimated effectiveness in achieving category objectives
1 = Very Low Level of Effectiveness
10 = Very High Level of Effectiveness

Our recommended approach proposes the adoption of a "hybrid" of several of the organizational models described above in an attempt to account for several key factors that are specific to the current and future conditions in the City of Norman and Cleveland County. Some of these community specific factors include:

- The size of the community
- The fact that parking management will essentially be a new operational function and that there is a lack of existing expertise to manage this discipline
- The desire for improved coordination and collaboration between the City and County
- The desire to promote the new downtown master plan and County Complex Master Plan

- The desire to improve coordination and communications with the University of Oklahoma on parking and transportation issues

The preferred organizational option for Cleveland County/The City of Norman merges the following two organizational models:

- The Professional Services/Out-Sourced Management Model and
- The Parking District/Commission Model

This approach is seen as the best option for Cleveland County and the City of Norman for the following reasons:

- The Professional Services model envisions a small, lean staff that could be housed in either the City or the County or could be a jointly funded position reporting to a quasi-independent Commission. Part of this recommendation is in recognition that the overall program will be relatively small, reflecting the size of the community and the relative program budget. This option begins small from a staffing perspective, but is scalable over time if needed.
- Initially a parking manager, with a limited support staff or even shared support staff is envisioned. Depending on how quickly new program initiatives advance (for example if new technology acquisition and deployment are pursued) a "special projects" coordinator may be needed (or this type of position could be evaluated as part of the private parking management contract).
- The parking manager position should have strong planning, program development and communications abilities. They need to be able to generate trust and confidence in the community and with the City Council and County Commission.
- The primary responsibility of the parking manager initially will be program and policy development and assuming the hiring of a private parking management firm (at least initially), he/she will provide contract management and administrative services.
- This would include such items as:
    - Coordinating with other City/County departments/functions
    - Recommending parking rates/fines and other policies
    - Reviewing and approving program revenue and expense budgets
    - Implementing directives from and reporting to the parking commission board
    - Developing an RFP to hire a private parking management firm
    - Working with the private parking management firm to develop standard operating polices/procedures in a variety of areas (see Appendix 1 – "20 Characteristics of Effective Parking Management Programs")
- The outsourced management component recognizes that no significant parking management expertise currently exists within either the City or County. Engaging a private parking management firm (at least for an initial three-year term) will provide the following benefits:
    - Helps ensure that the program gets successfully established
    - Provides a base of parking management experience and competence
    - Provides the County/City with a built-in advisory function during the early years (all the major private parking management firms will pitch this as a benefit)
    - Provides established business practices, tools, forms, policies, procedures, etc. – in essence the private parking management firm can help get all the program

operational basics in place more quickly and efficiently than can be done by creating a program from scratch with only internal resources
    - The private parking management firms will provide a robust set of system reporting options including detailed revenue and expense reports, program budgets, maintenance programs, etc.
    - After the initial three-year term of the private parking management firm, an assessment should be conducted to determine whether the firm has delivered enough value for the parking management fee to be continued or whether the program could be managed exclusively with in-house staff.
- The District/Commission model envisions a governing board of commissioners made up of 5 individuals representing different aspects of the community.
    - Examples of the type of expertise desired for parking commission members might include:
        i. Two County representatives: the County has the financial capacity to fund new parking infrastructure and new development programs to support community revitalization and investment
        ii. Two City staff representatives: City positions that typically are involved in a parking commission board might include the Mayor, City Manager, or their designee; City Council member(s) whose wards are represented; or a department head such as the Director of Planning, Finance, or Public Works
        iii. One ad-hoc community representative representing a large invested downtown employer; property owners/developers; business leaders (Norman Downtowners Association, Campus Corner Merchant's Association members, etc.; or a representative from the University of Oklahoma
    - The new parking program should have a dedicated manager responsible for managing on-street, off-street and parking *enforcement* functions.
    - All parking revenue streams should be consolidated to support parking as a dedicated fund.
    - The parking commission board and director should actively attempt to leverage parking's potential to support community and economic development strategic goals.
    - To achieve a more fully integrated parking program, it is envisioned that additional functions will be added over about a five-year period. These additional functions should include:

        - A more robust parking planning function (working with County/City Planning on parking and related transportation issues). There are a number of parking specific planning tools that will be recommended. Parking should also be at the table when issues related to zoning code changes and parking requirements are debated and amended.

        - Better integration and collaboration with downtown management and economic development programs. One of the lessons learned from other parking commission models is the extent to which parking can become a true community partner in terms of downtown revitalization and development efforts.

Collaborative program initiatives and participation on boards and committees and generally closer working relationships can generate significant community wide benefits to all parties.

- A specific focus on developing programs related to transportation demand management, transportation alternatives and other sustainable transportation program options should be developed over time. In the long-term, the parking program should evolve to adopt a more comprehensive and balanced mobility management function.

Internal Parking Program – Roles and Responsibilities

The County/City parking program should have complete responsibility for the management of all parking related program elements, including the following program components:

Off-Street Parking Facility Management – This includes day-to-day operations of parking facilities (both garage and surface) as well as maintenance, management, marketing, and security of facilities.

On-Street Parking Resource Management – This component includes management of unmetered and metered on-street spaces, which could include commercial districts, transit station areas, and neighborhood areas.

Collaborative Management of Private Assets – This includes working with private sector property and business owners, as well as developers, to define shared or leased parking management agreements, or development plans for public-private partnerships related to parking facility construction. Additional program revenues could potentially be generated by having the Parking Commission manage private parking assets on a shared revenue basis.

Parking Enforcement – Enforcement includes introduction of on-street and off-street parking enforcement, management of citations, collection of violations revenue, etc. Adjudication of parking citations should be a function separated from the department that issues the citations.

Parking Planning and Policy Development – This includes developing plans and policies to support the parking program, as well as coordinating with area stakeholders such as businesses, churches, medical campuses, local universities and colleges, residents, regional transportation districts and local/state transit agencies. Coordination with County/City planning departments is also an expectation.

Special Event and Downtown Management Coordination – This includes developing plans and coordinating parking management policies and procedures related to special events. A close working relationship between Norman Downtowners Association, the Norman Convention and Visitors Bureau, local event venues, the library and other private sector groups that host large events will be required.

Technology Acquisition and Management – This includes the planning, acquisition, management, and maintenance of parking management, revenue control systems, communications, and associated technologies to help manage and support a data-driven program operation. Developing a comprehensive web-based parking management system that can grow and evolve with the program is highly recommended. Coordination with

City/County IT departments as it relates to technology acquisition and implementation is recommended.

Operations and Maintenance – Operations and maintenance includes the overall day-to-day operation of the program's assets and the ongoing routine, preventive, and reactive maintenance needs of the program assets. Outsourcing of day-to day operations to a private parking management firm is recommended as discussed above.

Finance and Budgeting – This includes developing, adapting, and managing annual and program budgets, as well as capital acquisition and ongoing maintenance and management costs. Developing maintenance reserves and parking repair and replacement reserve funds should be a long-term priority. As stated earlier, it is recommended that the parking department will be established as a separate fund.

Mobility/Transportation Alternative Programs – A longer term goal of the program will be to evolve programs that will include the introduction and management of mobility improvements intended to enhance the transportation system and support an efficient parking and mobility program.

One of the most important actions that needs to be undertaken is the authorization of a parking director/manager position and the recruitment/hiring of a parking director/manager. We highly recommend that the County/City recruit and hire a high caliber individual that has both parking and transportation management experience and also excellent communications skills, the vision to guide program development and someone who can work well in a team environment.

Parking is more complex and inter-related than many other functions. Parking can also be very controversial and needs a manager that can generate confidence and trust while also being politically astute. As the department evolves into a more robust, mature program with an expanded scope of services, it is recommended that the parking manager position be reviewed with an eye toward the development of a "Parking Director" or "Parking Administrator" level position. An extensive document has been provided in the report appendices which provides an overview of parking administrator positions from around the country including salary information, examples of program scopes and several example position descriptions.

As the department expands its scope and matures, new potential areas of staff development and recruitment might include "accounting and auditing", "planning and community education" and "special projects".

This organizational recommendation also envisions some form of Parking Advisory Council to provide a mechanism for ensuring on-going community engagement and input. The envisioned Parking Advisory Council should attempt to recruit a range of community leaders who are both invested in downtown Norman and have strong business backgrounds to provide sound direction and guidance. Developing some level of authority to affect or at least recommend policy decisions is important to ensure that high quality board members see their role as having value and that that they are not merely ceremonial.

A framework should be developed whereby certain "policy-level decisions" are defined as the responsibility of the Parking Commission and more operational level decisions are ceded to the Parking Advisory Council and/or parking director/manager. If there are certain policy decisions

that the City Council or County Commission decide should be made only by elected officials, these policy areas should be defined up front.

Optional Organizational Recommendations

Based on the Cleveland County / City of Norman - Organizational Model Analysis spreadsheet (see page 88), the second highest ranked option was the Parking District/Commission model. This option is very similar to the recommended option without the engagement of the private parking management firm. This option, however, would require the hiring of more County/City staff and would not provide the needed parking management expertise to help ensure a successful program launch.

The third highest ranked option was the creation of a multi-jurisdictional parking authority. The primary difference between the Parking Authority model and Parking District/Commission model is that the parking authority model typically includes bonding capacity. Since both the City and the County already have this ability, this function was not seen as critical at this time. Parking Authorities also are more common in larger communities.

6. Recommended Parking Management Program Framework

Charting the Right Course

Based on feedback from project meetings and community engagement focus groups, the Kimley-Horn project team drafted a preliminary set of program goals and guiding principles.

The purpose of these program goals and guiding principles is to establish a strategic framework upon which to build a new parking management plan for Cleveland County/City of Norman. Included in this section are the following elements:

- A draft vision statement
- A draft mission statement
- Draft Guiding Principles

The overall parking program recommendations were developed to support this draft program vision / mission and guiding principles.

Draft Vision Statement:

"The Norman parking program will strive to develop a superior, customer-oriented parking system, responding to the current and future needs of parkers, including visitors, employees, employers, and property owners through active planning, management, coordination, and communications."

"The Norman parking program shall be considered an integral component of the community's economic development strategies and programs."

Draft Mission Statement:

"The Norman parking program is committed to enhancing the parking experience for the County/City's customers and stakeholders. Parking policies, planning, and programs will effectively support the community's strategic goals and objectives."

Recommended Guiding Principles

The goal in crafting these guiding principles for the parking program is to develop a comprehensive approach to parking management for the City of Norman and Cleveland County that will provide an integrated, action-oriented, and accountable system of parking and access management strategies that supports, facilitates and contributes to a sustainable and vibrant community. These principles are strategic in nature, responsive to the needs of the community and aligned with the larger community's strategic and economic development goals.

These parking program Guiding Principles will encourage the use of parking and other transportation resources to support and facilitate priority economic development goals and serve prioritized user groups. They will also serve as a foundation for near and long-term decision-making relating to parking management and development in the downtown.

Draft Guiding Principle Categories:

1. Organization/Leadership
2. Community and Economic Development
3. Leveraging Technology
4. Planning /Urban Design
5. Effective Management/Accountability
6. Customer Service Orientation
7. Communications/Branding /Community Education
8. Accountability/Financial Management
9. Integrated Mobility Management
10. Sustainability

A statement better defining each the ten draft recommended guiding principles is provided on the following pages.

Guiding Principle #1 – Organization/Leadership

The Norman parking management system will be "vertically-integrated" with responsibility for:

- Managing on-street parking
- Managing County and City owned off-street parking
- Coordination with privately owned off-street parking
- Parking enforcement/citation management and adjudication
- Parking planning and development
- Transportation demand management

Consolidating the various parking functions under a single entity will establish a consolidated system that is action-oriented, responsive, and accountable with improved coordination and operating efficiencies.

Recruiting a strong leader is a key element for success. The organization leader must have strong vision and communications skills, specialized parking and planning expertise, and be capable of educating other community leaders, stakeholders and private sector partners on the importance and relevance of a strong parking management organization. Strong general management and financial program development skills are also required.

Guiding Principle #2 – Community and Economic Development

The Norman parking management system will be guided by community and economic development goals and adopted policy directives that are the result of collaborative processes between Parking program staff, other agencies and involved stakeholders.

The parking program will use its resources to promote mixed-use and shared-use parking strategies as well as promoting alternative transportation modes through the creation of incentives, partnerships and programs to attract private investment; this will include reviewing and updating existing County/City parking requirements, as appropriate.

It is envisioned that the Norman parking management program will work in partnership with economic development agencies, Norman Downtowners Association and other entities actively engaged in community and economic development work in the downtown. The addition of County/City's new parking management focus in economic development projects will encourage the leveraging of strategic parking development as a significant tool to promote targeted and prioritized development projects in downtown.

Guiding Principle #3 – Leveraging Technology

The Norman parking management system will be an adopter of technology solutions to enhance customer service and parking information options.

A key goal is to make parking less of an impediment to visiting the County/City and more of an amenity.

Technology will be leveraged to streamline and simplify access to parking and will be a key parking management strategy. Another key technology related goal is to enhance the efficiency and effectiveness of parking management staff and programs.

Guiding Principle #4 – Planning / Visioning/ Policy/ Urban Design

The Norman parking management system shall have an active and comprehensive planning function.

The parking system will be included in all strategic and transportation planning efforts. The system will work with County/City planning staff to review and evaluate parking zoning

requirements, the development of parking design standards that promote good urban design principles related to parking structures and mixed-use projects, and the creation of transit oriented development parking standards.

Effective parking planning will mean an improved understanding of parking supply/demand conditions on an on-going basis, and ultimately the development of parking infrastructure that will enhance and better support the community strategic goals and urban design.

The vision of an enhanced planning and policy development function will be pursued on multiple levels.

Parking management strategies and programs should support and compliment other access modes as a means to better facilitate the accessibility and user-friendliness of downtown Norman as a preferred regional destination. Resources shall be effectively planned and managed to promote and support multiple access modes into and around the downtown. Primary access modes include automobile, transit, bike/motorcycle and pedestrian users.

Well-defined parking facility design criteria, parking related streetscape enhancements and effective integration of signage and wayfinding elements are all areas that this principle will promote. Parking management will work toward developing a parking system that continues to be self-supporting and sets asides funds for maintenance reserves and future capital asset funding.

Guiding Principle #5 – Effective Parking Management/Accountability

The Norman parking management system will be a forward thinking, "Best-In-Class" parking program.

The parking program should anticipate future patron needs in the context of community economic development and other planning initiatives and seek to integrate supportive parking and multi-modal access strategies as appropriate.

Evaluation of other parking management best practices and new technologies should occur on an on-going basis. Effective facility maintenance, infrastructure reinvestment and other system management fundamentals will be routinely addressed. Emphasis will be placed on enhancing parking facility appearance, maintenance, safety and security, regardless of facility ownership. The parking management system will promote standards to encourage comprehensive and pro-active facility maintenance and security plans.

Facility maintenance reserves and other maintenance best practices will be encouraged in the County/City-owned facilities. Publicly available parking facilities marketed through the Norman parking management system will agree to a community developed set of parking facility standards. Participating facilities will be routinely monitored.

Parking facilities will incorporate public art and creative level identification/theming to enhance the parking experience for their patrons and make parking facilities more navigable and inviting.

Guiding Principle #6 – Customer Service Orientation

Parking will promote Cleveland County and the City of Norman as a desirable destination for workers, businesses, shopping, dining, and recreation by making parking a positive element of the overall community experience.

The Norman parking management system will strive to develop and coordinate private and publicly owned parking facilities that are clean, convenient and safe.

Parking enforcement staff will present a friendly and professional appearance and receive on-going customer service and community ambassador training.

Ongoing goals of the parking management organization will include: responsiveness to community needs, openness to fresh ideas and active participation in community planning and events.

One major goal of the Norman parking management system is to create a parking program that will be easy for the visitor to understand and to access. This will be accomplished through the use of common branding and marketing, an integrated signage plan, validation programs, a web-based information clearing house, special events programs, etc.

Management of the on-street parking system will be enhanced over time through investments in new technology and more customer friendly parking enforcement policies.

The Norman parking management system should aim high and strive to achieve a Best-In-Class parking program. All aspects of County/City parking should reflect an understanding of what the customer desires in terms of a positive and memorable experience.

Special programs to address retail enhancement initiatives, shared-use parking, employee parking, special/large events parking, etc. will be developed. These programs will be developed in a collaborative manner and designed to support larger community goals and objectives.

Guiding Principle #7 – Communications/Branding/Marketing and Community Education

Parking management programs and facilities will be developed to function as positive, marketable assets for Cleveland County and the City of Norman.

Parking management strategies and programs will be cross-marketed to promote the County/City as a unique and visitor-friendly regional destination. Parking availability shall be well publicized to enhance the perception of parking as a positive element of the community experience. Reinvestment of parking resources back into the downtown will be promoted. The Norman parking management system will develop an effective branding program.

In addition to web-based information, the Norman parking management system will develop educational materials on topics such as: parking development trends, parking safety tips, etc. The organization will also promote discussion with parking facility owners/operators on topics such as facility condition assessments, maintenance program development, parking management best practices, etc.

County/City parking programs and information shall be well promoted and marketed. The Norman parking management system will work closely with the Norman Downtowners Association, the City and County's Economic Development departments and other community agencies/stakeholders to promote, educate and market parking programs.

Guiding Principle #8 – Accountability / Financial Management

The parking system will strive, over time, to be financially self-supporting and accountable to stakeholders.

Management will work toward developing a parking system that is self-supporting and sets aside funds for maintenance reserves and future capital asset funding.

By aligning approved parking revenue streams from on-street, off-street, enforcement, (and potentially special assessment fees and fee-in-lieu programs), it is possible to develop a parking system that self-funds all operating and maintenance expenses, facility maintenance reserves, planning studies and future capital program allocations. A consolidated parking revenue and expense statement should be developed to document all parking related income streams and expenditures to give a true accounting of parking finances.

Guiding Principle #9 – Integrated Mobility Management

The Norman parking management system will support a "Park Once" philosophy and a balance of travel modes, including bus, vehicular, bicycle and pedestrian, to meet community-wide access goals. Parking strategies and initiatives will be coordinated and aligned with the Norman comprehensive plan as adopted by the City of Norman.4

The parking management plan will promote a "park once" strategy that uses parking supply efficiently and emphasizes "linkages" to other forms of transportation.

The parking program will be a supporter and potentially a funding partner for a variety of transportation demand management programs and transportation alternatives that promote improved community access and a more sustainable parking and transportation program.

Guiding Principle #10 – Sustainability

Initiatives to promote more sustainable and efficient operations will be actively pursued.

"Green" strategies that can result in more efficient use of parking facilities and provide other benefits, including reduced congestion and pollution, improved transportation choices, more efficient land-use, and improved streetscape aesthetics. Sustainability will be an integral part of the day-to-day operations of the Norman parking management system.

7. Recommended Parking Program Implementation Plan / Action Items

20 Characteristics of Effective Parking Management Programs Overview

This chapter, "Recommended Parking Program Implementation Plan / Action Items" introduces our parking management framework/approach that we call the "20 Characteristics of Effective Parking Programs". Together this and the previous chapter provides a comprehensive and strategic approach to parking program development and management. The full "20 Characteristics of Effective Parking Programs" document can be found in **Appendix 1**.

The "20 Characteristics" include all the elements in the list to the right. A parking system that has all twenty of these characteristics is well on its way to being in a class apart from the majority of parking systems. The ultimate goals are a system that provides professional management, understands the role it plays in contributing to the larger objectives of the downtown or business district and is responsive to the community to which it serves.

Another significant project deliverable can be found in **Appendix 11.** – "Parking Management and Design Best Practices". This collection of parking management and design "best practices has been compiled over a number of years and continues to evolve as the parking industry evolves. Our goal in the development and organization of this document was to provide a comprehensive categorization of parking planning, management and design areas to make finding specific best practices easier.

Primary Action Items

Using the parking program "Guiding Principles" outlined in the previous section as the basis for a new parking management plan, this section will outline specific recommended action items to begin laying the framework for a more strategic parking management program and strengthening the fundamentals of parking operations for the County/City.

These primary action items are seen as the most critical for establishing the new program framework, setting a new direction and implementing needed system improvements. A collection of additional recommendation that are seen as less critical are provided in the section entitled "Secondary Action Items". These are program "best practices" that can be implemented as funding is available or as needed to address specific community issues or opportunities.

Introduction

The following actions are necessary first steps toward developing an enhanced parking program for Cleveland County and the City of Norman. These initial steps are needed to establish the new management structure and to begin to upgrade the systems and staff capabilities needed to achieve the goals of providing a more customer focused, sustainable and self-supported parking program for the community. This required investment is needed to provide the parking program with the tools needed to effectively manage the system. These initial steps will also support the primary goals of enhancing customer services and economic development by making downtown more appealing to businesses wishing to relocate to or remain downtown. All the stakeholder feedback to date agrees that an effective public parking system is an important element in the revitalization of downtown Norman.

Many of the recommendations and concepts presented in the Parking Strategic Plan may be unfamiliar to some readers and may require more detail to be completely understood. In an attempt to keep the main report document as concise as possible, we have provided a series of Appendices to provide more background on some topics, including tools to aid in program implementation such as sample agreements, sample manuals, supporting articles and whitepapers, policy recommendations, process checklists, etc. At relevant points within the strategic plan, notes are provided to refer the reader to a specific appendix item.

A discussion of each set of Primary Action Items follows.

Primary Action Item #1: Adopt New Program Organizational Structure, Vision and Mission Statements and Recommended Parking Program Guiding Principles. Hire a Parking Management Professional, Create a Parking Advisory Board and Implement Parking Management Best Practices

This report identified the lack of well-defined vision and mission statements and related program "Guiding Principles" relative to parking as a weakness and provides recommended vision and mission statements as well as a comprehensive set of guiding principles as the basis of a new program strategic framework.

It is recommended that the County/City hire a new Parking Manager and that this individual work collaboratively with the County/City's Planning Departments and a newly-formed Parking Advisory Board to review and refine these draft documents and adopt them as the basis of new parking program strategic plan.

A public review process including the County Commission, City management, Norman Downtowners Association, and other key stakeholder groups is recommended to obtain additional input and feedback and to increase public buy-in to the new strategic direction.

Ultimately, formal adoption by the County Commission and City Council is recommended. To further promote program development, a document containing an extensive collection of Parking Management Best Practices and large set of appendices/parking management toolkit has been provided as part of this study. It is recommended that these documents be used by staff as resources to identify additional program enhancements going forward.

Primary Action Item #1

Adopt New Program Organizational Structure, Vision and Mission Statements and Recommended Parking Program Guiding Principles

Implement Parking Management Best Practices

Conducting a public review process related to recommendations of this study including City management, Norman Downtowners Association, and other key stakeholder groups is recommended to obtain additional input and feedback and to increase public buy-in to the new strategic direction.

Review the "20 Characteristics" white paper (Appendix 1) and the Parking Management Best Practices document (Appendix 11) and other tools provided to identify additional program enhancements going forward.

Primary Responsibility:
New Parking Director and Parking Commission Board

Key Partners:
Related City/County Departments, new Parking Advisory Board

Timeframe:
Complete by January 2019

Supportive Documents/Tools Provided:
Appendix 3 Sample Parking Administrator Position Description
Appendix 22 New Parking Manager Integration-Action Plan
Appendix 11 Parking Management Best Practices
Appendix 43 Resolution to create a Parking District

Primary Action Item # 2: Engage a private parking management firm and develop operational policies and procedures. Begin a process to evaluate investment in new on-street and off-street parking technology.

One of the primary strategies to make downtown parking more visitor friendly, improve operational policies and procedures and enhance parking system revenues is to upgrade the parking system's technologies. Engaging a private parking management firm for an initial three year period is recommended to advance this goal.

Developing a parking management technology master plan to provide a web-based parking management platform that is capable of providing the latest customer services and revenue/access control functionality is highly recommended. Appendix 15 provides a parking technology overview and a peer cities review for more detailed information related to current technologies and specific management applications in similar municipalities with more advanced parking management programs.

Implementing paid on–street parking is a well-documented best practice and would help the County/City address several issues identified in the course of this study. However, on-street paid parking is somewhat controversial and if pursued will require significant additional public outreach and planning. It has been documented in many cities across the country that implementing new "smart parking meters" (either multi-space or single-space credit card enabled meters) improves customer parking availability on-street through increased parking turnover and provides an important funding source to pay for future parking system capabilities in terms of staffing, technology (such as mobile LPR enforcement systems, etc.) as well as funding for parking structure maintenance and repair work.

Pay-by Cell Phone/Mobile Apps are additional payment options that the County/City should consider due to the very tangible customer benefits that this option provides.

The Parking program should develop an RFP process for new parking technology and potentially on-street meter acquisition as a first step to get a range of parking management functions and new customer service offerings. This should be followed by a thorough analysis of what the County/City can afford in terms of its initial investment and based on the projected revenue increases, lay out a defined plan to continue system upgrades going forward. Consideration should also be given to alternative purchasing strategies such as equipment leasing or other

Primary Action Item #2

Engage a private parking management firm and develop operational policies and procedures. Begin a process to evaluate investment in new on-street and off-street parking technology.

Upgrading the parking system's policies, procedures and technologies is a key strategy to make downtown parking more visitor friendly, improve operational efficiencies and enhance parking revenues.

On-street parking meter upgrades have the greatest potential for achieving the stated goals above.

Expanding Pay-by Cell Phone/Mobile Apps are another payment option that provides very tangible customer benefits.

These technology upgrades will come with some increased costs. Increasing on-street parking rates in conjunction with the technology upgrades is recommended.

special offers such as lease-to-own or partnerships where by equipment is provided at no or reduced cost based on a sharing of system revenues.

The latest on-street technology includes features that enable improved operational efficiencies by reducing the need for daily meter collections (just-in-time-collections), reduced number of meters (if multi-space meter are chosen), enforcement route optimization based on improved management data from the meters, etc. Investment in mobile license plate recognition technology for parking enforcement is also highly recommended.

The introduction of this new technology will also come with some increased costs related to communications fees, credit card and cell phone transaction charges, etc. To help defray these new system costs, setting initial on-street parking rates to $1.00/hour is recommended. This move will also help keep on-street and off-street rates in proper alignment (on-street, short-term parking rates should be higher than off-street rates). A white paper on the latest on-street parking technologies is provided as a resource to support this action item.

Primary Responsibility:
New Parking Director and Parking Commission Board

Key Partners:
County/City Finance, IT and Purchasing Departments, Parking Advisory Board, City Administrator, City Council, County Commission

Timeframe:
New Technology Implementation Strategy Completed by the 4th Qtr. 2018
Parking Technology RFP issued by the 2nd Qtr. 2019,
Implementation 3rd quarter 2019

Supportive Documents/Tools Provided:
Appendix 6 On-Street Parking Technology Overview
Appendix 11 Parking Management Best Practices
Appendix 12 License Plate Recognition Whitepaper

Primary Action Item # 3: Leverage Parking as a Community and Economic Development Strategy and Develop a Comprehensive Parking Planning Function

Link parking planning to larger community and economic development initiatives.

Recommended parking planning activities include: on-going monitoring of parking supply/demand and land use data on a facility/lot specific basis. Documentation of lot/facility utilization on a regular periodic basis will allow the parking program to better manage existing resources as well as plan for future parking needs.

Recommended new on-street parking meters (and even some existing meters) can provide the parking program with improved management and system utilization data. However, simply having the data is not enough. It must be collected, tracked and analyzed for it to be of value from a planning perspective.

Primary Action Item #3

Leverage Parking as a Community and Economic Development Strategy

Develop a Comprehensive Parking Planning Function

On-going monitoring of parking supply/demand on a facility/lot specific basis is encouraged.

Documentation of lot/facility utilization on a regular periodic basis will allow the Parking Authority to better manage existing resources as well as plan for future parking needs.

Consider investing in new parking count and monitoring systems to improve program planning data and analysis capabilities.

Beyond parking data collection and analysis, the on-going assessment of potential long-term parking development sites, the creation of a parking lot and structure design guidelines and the development of a parking specific capital projects list are all parking specific planning efforts that are expected from an effective parking program.

Parking and transportation are important support systems that are most effective when specific programs, policies and philosophies are aligned with a larger downtown master plan. Incorporating this Parking Strategic Plan as an integral component of the recently developed Norman 2025 Land Use and Transportation Plan (2025) should be pursued.

Review Appendix 32 - A white paper on the topic of "Parking as an Economic Development Strategy" for more specifics.

Review Appendix 9 - For example guidelines for using parking as an economic development strategy.

Primary Responsibility:
New Parking Director and Parking Commission Board

Key Partners:
County/City Planning Departments, Norman Downtowners Association, new Parking Advisory Board

Timeframe:
Develop a list of prioritized parking planning action items by July 2019.

Supportive Documents/Tools Provided:
Appendix 32 Parking as an Economic Development Strategy
Appendix 9 Guidelines for Parking as an Economic Development Strategies
Appendix 5 Recommended Reading List for Parking Professionals
Appendix 10 Tax Increment Financing Whitepaper
Appendix 28 Parking In-Lieu Fees Whitepaper
Appendix 18 Parking Requirements Reform Whitepaper

Primary Action Item # 4: Develop a Proactive Facility Maintenance Program Including Regular Facility Condition Appraisals, Prioritized Facility Rehabilitation Plans and the Creation of Parking Facility Maintenance Reserves

Primary Action Item #4

Develop a Proactive Facility Maintenance Program

Enhance the facility maintenance program. Make clean, safe and attractive facilities a signature element of the parking program

Adopting the "First 30 Feet" strategy for each parking facility is a recommended first step to show some early progress.

Development of an on-going and proactive facility condition appraisal process and prioritized facility rehabilitation program should be a high priority.

Create a specific "parking maintenance reserve fund" program.

Maintaining clean, safe and attractive facilities is a core function of any parking program and has a significant impact on the perception of the program and the community it serves.

A strategy of addressing the "First 30 Feet" of each parking facility is a recommended first step in showing some immediate progress. Key elements of the "First 30 Feet" approach include:

- Cleaning and painting
- Signage review/consolidation
- Adding "Welcome" and "Thank You" messaging
- Lighting

An important aspect of the County/City parking program will be a well-defined and effective long-term parking facility maintenance strategy. The development of an on-going and proactive facility condition appraisal process and prioritized facility rehabilitation program should be a high priority.

Another important dimension of a parking facilities maintenance program is to create a specific "maintenance reserve fund" program. Parking facilities are made of concrete and concrete deteriorates over time requiring significant investments in on-going maintenance and periodic restoration. Deferring maintenance will only cost the system more over time and without an effective program of routine maintenance and the setting aside of dedicated maintenance reserve funds; the likelihood of serious deferred maintenance leading to even higher maintenance and facility restoration costs is much more likely. Typical parking facility maintenance reserves are in the $50.00 - $75.00 per space per year range.

The maintenance plan should be in conformance with National Parking Association guidelines. A recommended parking facility maintenance scope and schedule are provided as Appendices 13 and 14.

Primary Responsibility:
New Parking Director and Parking Commission Board

Key Partners:
City/County Engineering and Public Works Departments, City/County Finance Department

Timeframe:
Develop a comprehensive facility maintenance plan by July 2019.
Conduct facility condition appraisals as noted above.
Develop a policy regarding maintenance reserves by 3rd Qtr. 2019

Supportive Documents/Tools Provided:
Appendix 13 Parking Facility Maintenance Manual
Appendix 14 Parking Facility Maintenance Schedule

Primary Action Item #5: Develop a New Parking Program Brand and Marketing Program including significant on-going community outreach strategies.

Develop a strong and consistent parking program identity and brand, which includes visual identity, program mission, vision, core values, investment in new communication pieces, collateral, etc.

Develop a strategic communication plan designed to improve overall parking program communications with its wide range of community stakeholders [See recommended strategic communications plan in this report]. Community outreach cannot be a one-time investment. Stakeholders and citizens should be continually engaged and asked for their feedback on major policy and programmatic decisions to help rebuild trust and "show" that the County/City is taking citizen feedback into account.

Primary Action Item #5

Develop a New Parking Program Brand and Marketing Program including significant on-going community outreach strategies.

Specific goals of this recommendation include:

- Improving the parking programs image
- Providing easier access to parking information
- Providing enhanced overall communications with key stakeholder groups and the public at large
- Promotion of parking facility utilization

Partner with existing organizations, like Norman Downtowners Association on marketing campaigns to help combat the perception that downtown is vacant, unsafe and/or underutilized.

Develop consistent standards for parking program branded facility signage to help guide customers to parking options.

Train staff and parking program spokespeople on customer-focused internal and external communications procedures.

Develop an enhanced parking program website. Keep parking information current.

Leverage social media to improve community feedback and information dissemination.

Consider the development of Annual or Bi-Annual Parking Report. An example of a parking program annual report is provided in Appendix 21 and an annual report template is provided in Appendix 15.

Primary Responsibility:
New Parking Director and Parking Commission Board

Key Partners:
City/County Communication Department, City/County IT Department, Norman Downtowners Association, Campus Corner Merchant's Association

Timeframe:
See the Parking Program Strategic Communications Plan- Appendix 36 for guidance on timing.

Supportive Documents/Tools Provided:
Appendix 4 Crisis Communications Plan
Appendix 21 Parking Annual Report from the Missoula Parking Commission
Appendix 15 Parking Annual Report Template
Appendix 36 Parking Program Strategic Communications Plan

Primary Action Item #6: Invest in Training and Staff Development with a Goal of Mastering the Fundamentals of Parking System Management and Operations

The Norman Parking Management System is being developed from the ground up. This provides exciting opportunities avoid many common mistakes made by parking programs that have evolved over time.

A significant investment in staff training is recommended.

It is highly recommended that the new parking manager join the International Parking Institute (IPI) and attend the annual IPI conference. The 2019 conference will be in Anaheim, CA. It is also recommended that the new parking manager join a state or regional parking association for developing relationships with her local peers. Involvement in the International Downtown Association (IDA) is also recommended as this can help ensure that the new parking manager is well acquainted with not only parking technical issues, but also downtown management and development strategies.

A program offered by the International Parking Institute is called the Accredited Parking Organization or APO. The APO program provides a structured program assessment and accreditation. Since the Norman program is just getting started, it may take a few years to achieve accreditation, but the program structure an assessment matrix is a valuable tool and process in and of itself.

Another cost effective and highly valuable training opportunity would be to schedule a series of visits with the parking advisory panelists that participated in this parking strategic plan. Each of them has offered to provide a personal tour of their systems and communities and it would build a strong peer group for the new parking manager to call upon for years to come.

Strategically invest in the use of consultants for technical expertise especially in the areas of new technology specification and more complex issues such as zoning and parking requirements reform and new facility planning and development.

Primary Action Item #6

Invest in Training and Staff Development

With a new parking manager with little parking experience, there will be a steep learning curve and a need for investment in staff training and personnel development.

A significant number of educational papers and tools has been provided in the appendices to help with this process.

Address the lack of staff knowledge and training of the current parking system's capabilities and features

Join the International Parking Institute and the regional parking and transportation associations

Invest in Peer City Program visits with the participants of the advisory Panel process.

Participate in the IPI's APO program accreditation process.

Primary Responsibility:
New Parking Director and Parking Commission Board

Key Partners:
County/City HR and Training Departments

Timeframe:
On-Going. Recommend attendance to the 2019 IPI Conference & Expo in Anaheim, CA

Supportive Documents/Tools Provided:

Appendix 1	*20 Characteristics of Effective Parking Management Programs*
Appendix 22	*New Parking Manager Integration-Action Plan*
Appendix 5	*Recommended Reading List for Parking Professionals*
Appendix 10	*Tax Increment Financing Whitepaper*
Appendix 34	*Developing a Retail Parking Support Strategy*
Appendix 11	*Parking Management Best Practices Tool Kit*
Appendix 23	*Parking Garage Security Whitepaper*
Appendix 2	*Valet Parking Program Development*
Appendix 35	*IPI Emergency Preparedness Manual*
Appendix 26	*Residential Parking Permit Programs Whitepaper*
Appendix 24	*Parking Facility Design Guidelines*
Appendix 28	*Parking In-Lieu Fees Whitepaper*
Appendix 29	*Parking Management Benchmarks / Key Performance Indicators*

Primary Action Item #7: *Develop a detailed facility opening / operational plan for the planned County garage.*

Primary Action Item #7

Develop a detailed facility opening / operational plan for the planned County garage.

Invest in on-street meter upgrades and system expansion

Refine the draft parking program budget provided as a base as the scope of the new parking program gets refined.

Set parking rates.

Appendix 37 provides a recommended approach to setting and reviewing parking rates.

Appendix 39 provides a high-level Parking Garage Start-up Plan. Key elements of this garage start-up plan include:

- Creating a "Garage Opening Team"
- Legal issues (contracts, agreements, etc.)
- Operations (Rates, management team organization, change funds, signage, tickets/supplies, forms, staffing, etc.)
- Payroll
- Human Resources
- Training
- Communications
- Accounting
- Monthly and Hourly Parking

Appendix 40 provides a preliminary parking program budget outline. This budget outline provides some basic assumptions related to program revenues/expenses and recommended parking rates, etc.

Appendix 41 provides a recommended approach to on-street parking meters and a preliminary parking meter revenue projection if the recommended parking meter expansion were approved.

Parking Rates

A limited review of parking rates from selected peer cities generated the following information:

	First Hour Rate	Additional Hours	Monthly Parking Average	Garage Parking Daily Max
Boise, ID	First Hour Free	$ 2.50	$ 180.00	$ 12.00
Spokane, WA	1.25 (per half hour)	1.25 (per half hour)	$ 175.00	$ 10.00
Eugene, OR	$ 1.00	$ 1.00	$ 72.00	$ 6.00
Fort Collins, CO	$1.00 - $1.50	$ 1.00	$ 44.00	$ 10.00
Billings. MT	First Hour Free	$ 1.00	$ 55.00	$ 7.00

Kimley-Horn recommends the following parking rates for the new County Garage:

Monthly Rates:

- $50/space/month - Covered Parking (200 spaces)
- $30/space/month - Uncovered (90 spaces)

Hourly Rates:

- $2.00 minimum (2 hours) (100 hourly spaces)
- Recommended "First-Hour Free" program in the garage
- Daily Max rate: $10.00

Primary Responsibility:
New Parking Director and Parking Commission Board

Key Partners:
County Commission and Norman City Council

Timeframe:
6 months prior to projected garage opening

Supportive Documents/Tools Provided:
Appendix 37 Parking Rate Assessment Strategies
Appendix 39 Parking Garage Start-Up Plan
Appendix 40 Parking Program Preliminary Budget Outline
Appendix 41 Parking Meter Upgrade and Preliminary Meter Revenue Projection

Primary Action Item #8: *Critically Assess the Current Parking Enforcement Program Using the Tools Provided. Invest in Mobile License Plate Recognition Technology.*

To assist in a more thorough review and evaluation of the parking enforcement program, Kimley-Horn has provided the County/City with two significant tools to aid in this process:

- The first is a parking enforcement program audit checklist (Appendix 19)
- The second is a sample parking enforcement officer manual (Appendix 20)

These tools should be reviewed and customized to better define and enhance the current parking enforcement program.

Consider investing in a Mobile License Plate Recognition system to improve parking enforcement consistency, efficiency and effectiveness. See Appendix 12 – A whitepaper on License Plate Recognition.

Primary Action Item #8
Critically Assess the Current Parking Enforcement Program Using the Tools Provided
Invest in Mobile LPR Technology
Use the provided parking enforcement officer handbook and parking enforcement program audit checklist to better define and enhance the current parking enforcement program.
Consider investing in a Mobile License Plate Recognition system to improve parking enforcement consistency, efficiency and effectiveness.

Primary Responsibility:
New Parking Director and Parking Commission Board

Key Partners:
County/City Police Department, IT Department

Timeframe:
Conduct reviews by October 2018

Supportive Documents/Tools Provided:
Appendix 19 Parking Enforcement Program Audit Checklist
Appendix 20 Sample Parking Enforcement Officer Manual
Appendix 12 Whitepaper on License Plate Recognition

Primary Action Item #9: Establish the parking program as a separate fund and combine all parking related revenue streams into this fund.

One of the big advantages that the County/City has the opportunity to leverage is the nearly "blank slate" that currently exists related to a parking program organizational and financial structuring.

By aligning all related parking revenue streams into one parking fund, the County/City has the potential to achieve one of the most important goals of any parking program – the ability to create, over time, a truly self-supporting that can cover all its own operating and maintenance funding, the creation of parking maintenance reserves and ultimately the funding of future parking facility capital development projects.

Parking revenues from the following sources should contribute to the parking fund:

- Off-street parking revenues
- On-street parking revenues
- Parking enforcement revenues
- Special event parking revenues
- Parking management fees for management of private facilities (if applicable)
- Future parking fee-in-lieu revenues (if applicable)
- Future parking assessment district revenues (if applicable)

Policies should be developed to define the appropriate use of parking revenues. Generally speaking the following priorities are recommended related to the approved use of parking revenues:

- Operations and maintenance
- New technology acquisition
- Parking facility maintenance reserves
- TDM and mobility management support initiatives
- New facility capital investments

Development of a program "financial plan" is recommended. See provided template in Appendix 25.

Primary Action Item #9

Establish the parking program as a separate fund and combine all parking related revenue streams into this fund.

By aligning all related parking revenue streams into one parking fund, the City has the potential to achieve one of the most important goals of any parking program – the ability to create, over time, a truly self-supporting parking fund that can cover all its own operating and maintenance funding, the creation of parking maintenance reserves and ultimately the funding of future parking facility capital development projects.

Parking revenues from the following sources should contribute to the parking fund:

- Off-street parking revenues
- On-street parking revenues
- Parking enforcement revenues
- Special event parking revenues
- Parking management fees for management of private facilities (if applicable)
- Future parking fee-in-lieu revenues (if applicable)
- Future parking assessment district revenues (if applicable)

Primary Responsibility:
New Parking Director and Parking Commission Board

Key Partners:
County/City Finance and Legal Departments

Timeframe:
Establishment of the financial structure of the department should be an early priority.

Supportive Documents/Tools Provided:
Appendix 30 Consolidated System Financial Report
Appendix 37 Parking Rate Assessment Strategies
Appendix 25 Parking System – Financial Plan Template

Primary Action Item # 10: Expand the Scope of the Parking Program over Time to be More Supportive of Alternative Modes of Transportation and Embrace More of a "Mobility Management Philosophy"

Downtown would benefit from increased investment in alternative modes of transportation.

The trend in the industry is to embrace a more holistic and integrated approach to parking and transportation – an "Integrated Mobility Management Strategy".

Another important dimension to this recommendation is to be aware of the need to balance both the supply and demand sides of the parking and access equation. Building public parking is extremely expensive and leveraging alternative transportation and Transportation Demand Management (TDM) strategies can reduce the need for additional parking over time.

TDM program elements support the Guiding Principle for Sustainability and a more balanced parking and transportation program.

Primary Action Item #10

Expand the Scope of the Parking Program over Time to be More Supportive of Alternative Modes of Transportation and Embrace More of a "Mobility Management Philosophy"

Embrace a more holistic and integrated approach to parking and transportation – an "Integrated Mobility Management Strategy".

Leverage alternative transportation and Transportation Demand Management (TDM) strategies to reduce the need for additional parking over time.

TDM program elements support the Guiding Principle for Sustainability and a more balanced parking and transportation program.

Other strategies in this area that are being supported by parking systems around the country include: community bike share programs, car sharing programs such as Zip-Car, bike racks and lockers, and traditional TDM strategies such as park and rides, preferential parking for car and vanpools, telecommuting, etc.

It is recognized that this is not the immediate priority for the County/City of Norman, but it is an important element and should be incorporated into the long-term program development strategy.

Primary Responsibility:

New Parking Director and Parking Commission Board

Key Partners:

Transit Agency, Bike Advocate Programs, Regional Transportation Association, County/City Planning

Timeframe:

Longer-Term Strategy

Supportive Documents/Tools Provided:

Appendix 11 Parking Management Best Practices Tool Kit
Appendix 33 TDM Quick Guide

Secondary Action Items

Action Item #S-1 – Stakeholder "Report Cards"

The Norman Parking Program should develop annual Parking Action Plan "Report Cards" or updates to keep the new Parking Advisory Board and community stakeholders informed and educated as to program development progress. These report cards or updates could involve the development of a concise set of parking program benchmarks that would be tracked over time.

INTENDED RESULTS:
Progress reporting could also take the form of a simplified "Action Plan Report Card" for specific stakeholder groups. This format could also be combined with a feedback mechanism to create an ongoing mechanism for community input and program development/refinement.

Action Item #S-2 – Develop Specific Overflow and Event Management Parking Strategies

Overflow parking plans describe the management strategies that will be applied when parking facilities fill, for example, during special events, peak shopping periods, or temporary reductions in parking supply. Below are some possible components of an overflow parking plan:

- Provide signs with directions to alternative nearby parking facilities.
- Provide adequate traffic and parking management staff during peak periods. Additional staff may be hired for special events.
- Provide information on parking and travel options for special event participants, highlighting those that can be used to avoid parking problems. For example, brochures that show both parking facility locations and transit options for major cultural or religious events.
- Encourage travelers to shift mode or use remote parking during peak periods. For example, retail employees can be required to use remote parking facilities or alternative commute modes during holiday shopping seasons.

Action Item #S-3 – Parking Facility Warranty Management

Collect all parking facility warranties into a three-ring binder or digital folder. Note all warranty expiration dates for items such as elastomeric coatings, expansion joints, etc. Place these dates in Outlook or other calendar programs used by the agency as a "tickler" to conduct a walkthrough inspection six months prior to warranty expiration. Schedule a representative of the contractor or manufacturer responsible to honor the warranty to participate in the inspection. Document inspection results with time and date stamped digital photos. Schedule repairs to warranty covered items prior to warranty expiration.

INTENDED RESULTS:
Assure that warranty covered items are taken care of while still under manufacturer's warranty. Average cost savings per facility $10,000 - $20,000.

Action Item #S-4 – Energy Saving Options in Parking Facilities

Invest in some new parking facility lighting systems for enhanced illumination and energy savings. We encourage the County/City to also evaluate options such as placing roof top and outer bay parking facility lighting on separate circuits so that these lights can be placed on photocells to reduce energy consumption during daylight hours.

INTENDED RESULTS:
Utility expenses are a major parking operating expense. Evaluate options to minimize on-going expenses in this category.

Action Item #S-5 – Develop an Internal Parking Program Operations Manual

As a primary staff training tool, develop parking facility operations manuals. Many systems have a separate manual for each facility or one common manual with individual facilities each given a chapter. Note: Sample parking operations manuals are provided in Appendices 16 and 17.

INTENDED RESULTS:
Document specific equipment and policies per facility for staff training as well as to document operating policies/procedures.

Action Item #S-6 – Develop a Parking System Information Database/Become the Central Clearinghouse for Parking/Access Information

Monitor and track parking rates, availability, owners, operators, contact info, etc. for all parking resources in downtown (both public and private). Coordinate and provide information relative to other transportation options. Consider providing this data on multiple downtown related websites.

INTENDED RESULTS:
Become a one-stop information clearinghouse for all downtown parking and access information (both public and private).

Action Item #S-7 – Marketing Tie-ins for Parking to Special Events

Work closely with the Norman Downtowners Association to promote parking tie-ins in conjunction with downtown special event promotions, downtown attractions/venues, etc.

INTENDED RESULTS:
This strategy leverages the shared benefits of joint marketing opportunities and promotes new parking/access system branding and marketing campaigns. See Appendix 38 Parking Branding and Marketing Best Practices.

8. Appendices and Parking Management Tool Kit

The following set of appendices provides a range of documents designed to support and augment the content of this Parking Strategic Plan. The content of this "Parking Management Tool Kit" ranges from an extensive collection of parking management best practices, to sample manuals, audit check lists, a variety of technical white papers, report templates, design guidelines, etc. It is our hope that these tools and educational resources will help advance the new parking program in Norman by providing technical support and direction in a number of key focus areas.

One of the major themes identified in the Parking Strategic Plan is the need to "master the fundamentals" of managing a municipal parking program. To this end, we have provided several documents that provide a comprehensive overview of the various elements that must be addressed to have a successful program. Appendix 1. entitled "The 20 Characteristics of Effective Parking Programs" provides a comprehensive parking management framework from which to begin. Another good resource is Appendix 7 (a. and b.). These documents outline a new program from the International Parking Institute called the "Accredited Parking Organization" (APO). Once your parking program has matured, attempting to get the parking program "accredited" is high recommended. However, in the short-term, the criteria outlined in the APO program assessment matrix can provide additional program development guidance.

We have also provided several very specific "tools" to help advance the Norman parking program in a number of operations focused areas. These tools range from a sample parking enforcement officer manual to a tool designed to critique and audit the existing enforcement program. Another example of an "operations focused tool" is a very detailed parking facility operations manual. In every case, the goal of providing these sample documents is for the Norman parking program to use them as a basis and guide for creating similar documents specific to their operation.

Finally, in anticipation that the County/City will authorize, recruit and hire a new Parking Director we have included an extensive collection of "parking administrator position descriptions" as well as several "white papers" on a number of topics that will hopefully put the new director on the path to success. Examples include: security, valet parking, in-lieu fees, tax increment financing, successful approaches to evaluating parking rates, etc.

It is our hope that these documents will provide valuable background information and practical tools to help advance and improve the Norman parking program as staff work to implement the primary recommendations contained in the Parking Strategic Plan.

Report Appendices & Parking Management Tool Kit – List

Cleveland County and the City of Norman are in a fairly unique position as they contemplate creating a new shared parking program essentially from the ground up. As such, these Appendices & "Parking Management Tool Kit" provide an extra set of tools, sample manuals, communications strategies and background materials to help the County/City develop a strong foundation and understanding of the breadth and complexities of a modern parking and access management program.

Some of these items will be immediately applicable and others anticipate issues that may arise if certain recommendations are implemented. In any case, we hope that you find these additional resources valuable as you begin to build your program.

Following the listing of "Parking Management Tool kit" items below is an annotated listing of each toolkit element to provide a better sense of what it includes and how it might apply to County/City's parking program development initiative.

Appendix 1 - 20 Characteristics of Effective Parking Programs
Appendix 2 - Valet Parking Program Development - Whitepaper
Appendix 3 - Sample Parking Administrator Position Descriptions
Appendix 4 - Crisis Communications Plan
Appendix 5 - Recommended Reading List for Parking Professionals
Appendix 6 - On-Street Parking Technology White Paper
Appendix 7a - APO Program Manual
Appendix 7b - APO Matrix Final 2016
Appendix 8 - FHWA Special Events Handbook
Appendix 9 - Guidelines for Using Parking as an Economic Development Incentive
Appendix 11 - Parking Management and Design Best Practices
Appendix 12 - License Plate Recognition (LPR) White Paper
Appendix 13 - Parking Facility Maintenance Manual
Appendix 14 - Parking Facility Maintenance Schedule
Appendix 15 - Annual Parking Report Template
Appendix 16 - Generic Parking Facility Rules and Regulations
Appendix 17 - Sample Parking Garage Operations Manual
Appendix 18 - Parking Requirements Reform Whitepaper
Appendix 19 - Parking Enforcement Program Audit Checklist
Appendix 20 - Sample Parking Enforcement Officer Handbook
Appendix 21 - Missoula Parking Commission Sample Annual Parking Report
Appendix 22 - New Parking Manager Integration-Action Plan
Appendix 23 - Parking Garage Security Whitepaper
Appendix 24 - Parking Garage Design Guidelines
Appendix 25 - Parking System - Financial Plan Template
Appendix 26 - Residential Parking Permit Programs - White Paper
Appendix 27 - Sample Meter Bagging Policies and Procedures
Appendix 28 - Parking In-Lieu Fees Whitepaper
Appendix 29 - Parking Management Benchmarks / Key Performance Indicators
Appendix 30 - Consolidated System Financial Report
Appendix 31 - Assessing an Uncertain Transportation Future – 2017 – Projecting the

Impact of Autonomous Vehicles and Shared Mobility Trends on Future Parking Demand
Appendix 32 - Parking as An Economic Development Strategy – Whitepaper
Appendix 33 - Kimley-Horn TDM Quick Guide
Appendix 34 - Developing A Retail Parking Support Strategy
Appendix 35 - International Parking Institute (IPI) Emergency Preparedness Manual
Appendix 36 - Parking Program Strategic Communications Plan
Appendix 37 - Parking Rate Assessment Strategies
Appendix 38 - Limited Parking Supply-Demand Update - Data Tables
Appendix 39 - Parking Garage Start-Up Plan
Appendix 40 - Parking Program Preliminary Budget Outline
Appendix 41 - Parking Meter Upgrade and Preliminary Meter Revenue Projection
Appendix 42 - Developing a Retail Parking Support Strategy
Appendix 43 - Resolution to Create a Parking Improvement District
Appendix 44 - 2016 Jacobs Parking Study Summary

Appendix 1

20 Characteristics of Effective Parking Programs

A Comprehensive Approach to Parking Program Development

COMPREHENSIVE PARKING PROGRAM DEVELOPMENT FRAMEWORK

Introduction

Parking, in our view, is an essential element of an institution's infrastructure and, when well-managed, it can contribute greatly to efforts to develop and sustain healthy and vibrant downtowns, universities and medical centers. Convenient, safe, clean and affordable parking is critical to attracting and retaining patients, staff, retailers, restaurants, office buildings/tenants and all other types of customers and developments.

Characteristics of Effective Parking Programs

Based on evaluating numerous parking systems in a variety of environments and of various sizes and complexity, we have identified a set of twenty characteristics, that when combined into an integrated, programmatic approach provides the foundation for a sound and well managed parking system.

These twenty characteristics include the program categories to the right:

A parking system that has addressed all twenty of these characteristics is well on its way to being in a class apart from the majority of parking systems. The ultimate goals are a parking system that provides professional management, understands the role it plays in contributing to the larger objectives of its environment and is responsive to the community that it serves.

The importance of parking as one of the most visible and often controversial elements of an environment's infrastructure is often underestimated. A well-managed parking system can be a key component in attracting and retaining customers, supporting new programs and developments and is essential to sustaining healthy and vibrant communities of all types.

Characteristic # 1: Clear Vision and Mission

Truly effective parking systems have a clear vision and well-defined mission. The development or periodic reassessment of the parking system vision/mission statements should be undertaken as an open and inclusive process involving a wide range of community stakeholders. In a municipal setting, it is recommended that the following groups be included in the public input process:

- Visitors
- Administration
- Department Heads
- Office Building Tenants
- Property Owners and Residents
- Employees
- City and Planning Officials
- Transit System Representatives

The development of a parking system's vision and mission statements should have one overriding goal; to see that the parking system's purpose and direction are tied to and supportive of the larger community's strategic development plan. There are a variety of ways that parking can support the health, vitality and development of the environment it serves. Having a professionally managed parking program that presents clean, safe, attractive and well-maintained facilities is perhaps the most visible dimension. Other attributes include providing an adequate supply of parking overall and ensuring appropriate allocation and management of those resources. The parking system exists to support the businesses that depend on convenient, well-managed parking for their success. Successfully meeting these goals promotes business success, retention and attraction.

The parking system administrator should play a key role in providing educational support to community and institutional leaders about the importance of parking and the role(s) parking can play (and cannot play) in meeting community and institutional objectives. Staying abreast of the latest developments related to parking system technologies can broaden the options available to improve parking system management effectiveness and efficiency. Common problems for parking systems, such as reserving the most convenient spaces for patients and visitors, promoting turnover of short-term spaces without being perceived as "unfriendly or heavy-handed", or providing more convenient customer payment options are good examples. The use of new technologies to support the mission and vision can have a

profound impact on the perception of the parking system and how it contributes to achieving the goals of the community it serves.

In successful parking systems, financial responsibilities are well defined and understood. This is a critical component of the vision/mission, as it directly impacts the perception of whether the parking system is meeting its obligations and expectations. Part of this important discussion relates to whether the parking system is expected to be subsidized by other revenue sources or cover all operating, maintenance and debt costs with direct parking revenues. Is parking expected to generate surplus revenue? Is it expected to fund other programs? Which of these options is feasible for your program depends on a number of variables.

A best practice related to having a clearly defined Vision/Mission for your program is the development of a set of parking system "Guiding Principles". In general, the Guiding Principles should be short and concise, a maximum of one or two typed pages. Some of the elements typically incorporated in such a document include:

Mission Statement/Statement of Purpose – Describes how the parking operation contributes to the success or mission of the larger organization.

Operations/Funding Strategies – Describes how operations are to be funded and also whether the operation is intended to be a self-supporting entity, a profit / revenue center, or a support service sustained through other primary revenue sources.

Interdepartmental Relationships – Defines relationships between various departments, especially other support departments such as Maintenance, Security, Communications, Facilities Management, etc.

Responsibility for Parking Operations – Is parking to be managed in-house? Will it be outsourced? A combination? Are all parking operations to be managed through a centralized operation or can other departments get involved in limited parking operations?

Rate Setting Guidelines – Defining guidelines for reviewing and setting parking rates can be important because it provides a transparent and formalized process for review of parking rates. This is generally done in conjunction with the annual budget planning cycle.

Options for Allocating/Procuring Parking – Defining how parking is allocated goes to the heart of the department's mission because of the prioritization process that is required. How parking is sold and to whom has a direct impact on customer service, operational efficiency, funding, staffing, etc.

Parking Planning – Many parking programs have an active and comprehensive planning function. The parking program should be included in all long-range strategic and transportation planning. Other efforts such as on-going facility utilization reviews, periodic supply/demand studies, site feasibility studies, the development of parking structure design guidelines, etc. should also be considered.

Procedures for Managing Losses of Parking Supply (both temporary and long-term) – Have procedures/guidelines in place for the coordination and replacement of parking spaces lost due to new development.

Definition and Communication of Parking Rules and Regulations – Having clearly defined parking rules and regulations is essential to any parking operation. How these rules and regulations are communicated can vary widely depending on the customer groups served and the environment. Having an effective communications plan can also keep your customers informed of changes brought on by construction and maintenance projects, implementation of new technologies, rate changes, new policies, etc. Additionally, a good communications plan can act as a marketing and public relations tool for the parking department. Parking departments are often criticized because of misperceptions or a lack of information about the performance and contributions made by the program.

Enforcing and Adjudicating Parking Rules and Regulations – Defining who is responsible for day-to-day parking enforcement and adjudication is an important operational decision. This decision can influence how revenues generated by parking enforcement are used. Other key parking enforcement issues that should be defined include: Who defines parking enforcement policies? Who administers the adjudication process? Who sets the rates for parking fines? Who has authorization for towing, booting or other enforcement practices?

Defining Parking Facility Maintenance Responsibilities – Parking facility maintenance is something that is too often cut from capital budgets. The result is often a larger price tag at a later date and can involve significant operational disruptions. Identification of parking facility maintenance as an important parking management principle should not be overlooked. Maintenance reserves should be set aside out of parking revenues and be considered a basic expense along with funding of parking operations and debt service.

Special Event Parking – If any one area requires a cooperative effort from the larger community, it is providing parking for special events. If parking supplies are tight, even small seminars or departmental functions can have a big impact to parking operations. On large campuses, several departments sponsoring several small "events" can cause big problems. Having a well-defined system for coordination of special events parking, which is strongly supported by the administration, can provide improved service for all patrons.

Budgeting and Planning Cycles – Because of the high costs associated with the development of new parking and the lead-time required for design and construction of new facilities, parking budgets can benefit greatly by the development of extended budgeting and planning cycles. Extended budgeting cycles better illustrates the needs for retaining revenues to cover periodic and long term maintenance, debt service, equipment replacement etc.

CHARACTERISTIC # 2: Parking Philosophy

A succinct statement or statements reflecting your philosophical approach to parking can be a valuable tool for communicating to your patrons, stakeholders and staff. The following are examples of some parking philosophies used by other parking programs from around the country along with brief commentaries:

Parking Isn't About Cars . . . It's About People

This statement reflects an understanding that parking is not simply the act of temporarily warehousing cars. It is, in fact, more about addressing people needs at the transition from the vehicular to the pedestrian experience. Under this philosophy, issues such as facility cleanliness, safety, lighting, wayfinding and customer service move to the forefront. Functional design elements that directly impact user comfort such as stall widths, turn radii, walking distances, etc. also take on special importance.

People Don't Come Downtown to Park

This concept reinforces the reality that parking, while an important support function and critical infrastructure element, is not the reason people visit your downtown (or hospital/campus). For the downtown to be successful there must be good restaurants, interesting retail and other special attractions. Even the best-run parking system with state-of-the-art facilities will not "attract" people to come downtown. However, poorly-run operations, lack of convenient parking or dysfunctional facilities can definitely be excuses for people NOT to come downtown. The fundamental principles behind this philosophy are three-fold: (1) The role of parking is to support other downtown or campus activities; (2) Eliminate parking as a "reason not to come downtown;" (3) Recognize what parking is not, i.e., an attraction.

Parking Should Be a Positive Experience

For years a prominent parking consultant had a slogan: "Parking should be a non-event". This notion has undergone a qualitative evolution to make parking not just a "non-event", but actually a "positive experience". In their book "The Experience Economy," Joseph Pine and James Gilmore address the concepts that, especially in America, what customers are actually purchasing are "positive experiences". One expression of this transition can be seen in the healthcare arena. Have you noticed that the lobbies of newer health care facilities have taken on the feel of grand hotel lobbies? At the hospital where I used to work, we extended the look and feel of the new bed tower lobby (marble, glass, air conditioning, etc.) into the parking structure elevator lobbies to extend that welcoming experience out into the parking environment. Similarly, the extensive customer service training we provided for hospital Guest Services staff was also required for parking attendant and valet parking staff. When Downtown Kalamazoo, Inc. took over the parking program in the 1980's, they changed the whole program operational philosophy by asking themselves this question: "How would the parking program be different if it were run by Nordstrom?"

Parking Is the First and Last Experience

Building on this concept is an appreciation of the fact that most of the customer's first and last impressions of any venue really begin and end with their parking experience. A customer might enjoy the best meal followed by a fabulous evening of entertainment while downtown, but if they had to circle and circle to find a parking space, or were accosted walking from their car to their destination by a series of pan-handlers, their whole experience would be tainted. Follow this up by an encounter with a surly, gum-chewing parking attendant upon exiting the parking facility and guess what they'll be talking about the next day? (It probably won't be the delicious meal they had at Gino's or the high-quality treatment they received at the Rehab Institute).

Parking Should Be Friendly, Not Free

There is no such thing as "free parking". One of the ongoing challenges that downtowns or campuses face when it comes to parking is cost. Because of land values, densities and walking distance issues, parking structures are here to stay in the downtown and campus environments and with them is the need to charge for parking in one form or another. The perception that parking at the mall is "free" doesn't help (even though it is not true). Even if you promote "free parking" as a marketing concept, someone is paying for that parking. Either through increased taxes or an increased cost of goods or services, the cost of providing parking is still there. This philosophy recognizes this reality and focuses instead on providing a friendly, well-managed parking experience.

Parking Is a Component of the Larger Transportation System

It is surprising how often parking gets divorced in people's minds from being a component of the larger transportation system. Structured parking, because of its cost, is often the reason that development projects "don't pencil," to use developer jargon. By considering parking in the larger context of a broad range of transit and transportation alternatives, demand management and shared parking strategies can be developed that help reduce the amount of parking required. This is especially true in urban areas and on campuses where good bus transit, light-rail, taxi service and increasingly popular urban residential developments can be found. Developing programs that integrate complementary parking and transportation strategies is a hallmark of this philosophy.

By adopting one or more of these (or other) overall parking philosophies, parking administrators can be more effective in addressing one of their key roles: community education. This educational process begins with your staff and extends out into the community in one-on-one meetings with customers and stakeholders. Using the building blocks of your parking philosophy and parking system guiding principles, the community education process can also take the form of public presentations, parking branding & marketing campaigns and community or institutional outreach programs. The goal of this educational outreach is to help the community better understand the role and contributions that the parking program is playing in support of larger community goals and objectives.

CHARACTERISTIC # 3: Strong Planning

One of the most important characteristics of well-managed and forward thinking parking programs is strong planning. The first step in developing a well-managed parking planning function is to have a solid understanding of, and excellent documentation for, existing parking resources. Documenting the basics is fundamental. Some basic planning elements that should be in place are:

- Parking inventory is complete and up-to-date (including both public and private parking).
- Parking inventories are sub-divided by type and use of space.
- Parking utilization by type of spaces is known and trends tracked.
- Changes in supply are documented.
- Changes in utilization are tracked and understood.
- Periodic Parking Supply-Demand Studies are completed.
- Quality parking maps are available and up-to-date.

One of the key planning tools that parking departments often overlook or don't understand is land-use data. Successful parking systems develop relationships with city or regional planning agencies so that valuable land-use data, information on proposed developments, downtown planning maps, etc., can be obtained and used in crafting parking planning strategies. When reviewing a strategic parking plan, I look for the following items:

- Is land-use data readily available and up-to-date?
- Are the work locations of monthly parkers known?
- Is historical parking development well documented?
- Are vacancy rates for key properties in the market area known?
- Is planning for the next parking development "on the drawing board"?
- Is parking represented and participating in other types of community studies e.g., downtown strategic plans, marketing studies, retail studies, economic development studies, transportation studies, traffic studies, etc.?
- Have strategically-located potential parking development sites been identified?
- Are future parking development sites being "land banked"?
- Are potential sites assembled to achieve an adequate footprint size to develop efficient parking structures (300-325 sq. ft. per stall)?
- Have parking lot and structure design guidelines been developed?

Parking system planning can also take less traditional paths. For example, identifying creative opportunities for public-private partnerships or joint development projects as a means to solve complex parking problems that affect multiple entities is hallmark of a "best in class" program. Identifying potential shared parking benefits between multiple user groups is often a key to the success of these potential partnerships.

Another important component to the parking planning puzzle is the financial dimension. This is discussed in more detail shortly, but having a defined source of revenues for planned future developments is critical. Stand-alone parking facilities are seldom able to pay their own way. There are, however, many examples of well-structured parking systems that can become not only self-funding, but

can also fund future capital maintenance and development projects and, in some cases, even return monies to the general fund. In these examples of financially successful systems it is a common characteristic that revenues from on-street, off-street and parking enforcement programs are first used to fund parking programs, including operations, planning, debt service, future development projects and facilities maintenance/restoration. This scenario is more often seen in municipalities and universities and less often in medical center environments.

Having a strong planning function is a key to developing a superior parking program. The degree to which parking is involved in larger community or institutional strategic and master planning processes is a good indication of the strength of the parking planning function. By assembling and sharing accurate and reliable parking information and understanding basic parking planning concepts, parking administrators can enhance their likelihood of being invited to participate in other planning arenas. Having this data available and up-to-date also allows you to be more effective in the role of the "resident parking expert."

CHARACTERISTIC # 4: Community Involvement

One common problem that is often found with struggling parking programs is that they are operated only to satisfy a narrowly defined set of internal objectives (typically focused on revenue generation). Successful parking programs understand that their larger purpose is to support the larger environment they serve. In a municipal environment, this means the businesses that create and sustain downtown vitality. In a medical center, it might mean a keen understanding of patient issues as they relate to parking. For example: knowing that Radiation Oncology patient's treatments generally only last 15 – 20 minutes and that they are sicker when they leave than when they arrive, might lead to the creation of a limited number of high-turn-over, specially permitted spaces to address the needs of this specific patient group.

Parking systems should develop close and cooperative working relationships with other departments (such as Radiation Oncology in the example above) or community groups such as economic development agencies, downtown business associations, planning and facilities departments, etc. in a downtown environment.

This does not mean that the parking system exists simply as a tool to be manipulated by these departments or organizations. The parking operation has its own goals and objectives. For example, if the parking system is operating under a mandate to be self-supporting, it may not be able to subsidize a downtown validation program, even though the local downtown business associations might desire this. However, acting as partners, mutually beneficial solutions can be devised to meet the overall objectives of both organizations whereby costs are shared or alternative funding sources are obtained.

Another significant area of potential partnership is community and parking system marketing. In the many successful downtown programs, for example, parking co-sponsors or shares in downtown marketing and promotional initiatives. The Downtown Business Association, the Chamber of Commerce and other groups promoting the downtown should include parking information in their publications and parking publications should promote the current programs of the other agencies. This cooperative relationship creates an impression of well-managed and collaboratively run programs and positively

enhances the image of both the downtown and the parking program. In a medical center environment have a well-managed parking system with customer friendly features such as valet parking, etc. can be positively promoted by the marketing/public information department.

Successful parking operations actively solicit public input from a variety of sources including: promotion of public forums, use of parking task force groups, and development of a group of "parking advisors" – people who have demonstrated an interest in parking issues (sometimes characterized as "complainers") who are recruited to provide input on an occasional basis. The key to success is to listen to the concerns of your customers, act promptly to resolve the issues (or engage and educate them on the "real issues") and then follow up to make sure their issues have been satisfactorily resolved. By doing this, you short-circuit the stream of negativity which too often circulates among customer groups, and you can begin to build a network of parking system supporters.

CHARACTERISTIC # 5: Organization

In conducting several recent parking system organizational analyses, an interesting dynamic was uncovered related to the evolution of parking systems. When a parking program is started, it is usually a small function and is located within an area of an existing organization that makes sense at the time or where certain expertise or manpower is available. Often in a municipal environment it is placed under Public Works. In a hospital environment is it often under Security. As the parking program grows and matures and is responsible for a larger number of capital assets and increasing revenue streams, a reassessment of how the program is organized and managed is a logical step in its evolution.

Whether your parking program is one functional element under another department, a quasi-independent parking authority, an arm of an urban renewal agency or the responsibility of a Downtown Business Association, an important question to ask is whether the parking organization is structured and staffed to best achieve its stated goals.

Some basic questions to ask related to the issue of organizational structure include:

- Are all parking operations to be managed through a centralized operation or can other departments or agencies get involved in limited parking operations?
- Is parking to be managed in-house?
- Should certain functions be out-sourced?
- Are there advantages to a hybrid approach?
- Does the current organization / staffing plan provide the right mix of skills, talents and abilities?
- Is staffing as efficient as possible? Are there tools in place to evaluate staffing adequacy? Efficiency? Program effectiveness?

When evaluating which organizational option is most appropriate for your particular environment, consider the following criteria to evaluate the relative advantages and disadvantages of each model.

- Supports Economic Revitalization
- Most Efficient and Cost Effective
- Most Customer Friendly

- Most politically feasible
- Most focused-on vision
- Easiest to achieve
- Most responsive to business & downtown stakeholders
- Most financially viable
- Most effective coordination
- Provides needed parking management expertise
- Best promotes long-term growth
- Facilitates intergovernmental coordination
- Supports the principal of "vertical integration"
- Facilitates downtown re-branding / integration with downtown master plan goals
- Promotes alternative transportation and multi-modal transportation options
- Fosters innovation and mission broadening
- Effectively identifies and engages with local "community champions"
- Ability to recruit or develop the best possible program leader

Another component of the evaluation process is to identify the program elements for which the parking system will be responsible.

CHARACTERISTIC # 6: Staff Development

Another interesting thing about parking is that, unlike property management, public administration, etc., there are no formal educational programs for parking management. You cannot go out and hire someone from the latest crop of college parking graduates. However, this is beginning to change. The International Parking Institute's (IPI) Certified Public Parking Administrator (CAPP) program has been in place for over ten years and is highly regarded. The University of Virginia administers this educational/certification program. The National Parking Association offers the Certified Parking Facility Manager (CPFM) certification program. For the most part, parking professionals still are learning as they go and bringing with them numerous skills and perspectives imported from a variety of previous work environments and experiences.

One characteristic of the most successful parking programs is a recognition of the unique knowledge, complexity and broad skill sets required to be successful in parking. These programs invest in the parking-specific training, networking and educational opportunities to develop their staff into "parking professionals". The following is a list of options to consider to actively promote parking staff development within your parking operation:

- Support participation in the International Parking Institute and National Parking Association's certification programs.
- Support participation in local, state, regional and national parking associations to create networking and peer-to-peer communications. These associations also provide the best access to parking-specific training opportunities for various staff levels from front-line to administrative.

- A recommended best practice is to have an "Operational Peer Review" performed on your operation. An "Operational Peer Review" involves having representatives from similar programs visit and critique your parking program with a "fresh set of eyes." Typically, this service is reciprocated. This is generally a low-cost initiative that can be set up directly or through the national, regional or local parking association and is an effective way to gain and share parking knowledge.
- Build a parking resource library – A basic bibliography of good parking texts that can increase your staff's knowledge of the parking industry is provided in Appendix 9.

CHARACTERISTIC # 7: Safety, Security and Risk Management

The importance of providing a safe environment in your parking facilities cannot be overestimated. The actual and perceived security within your facilities impacts the success not only of the parking operation, but also the businesses supported by those facilities.

Planning for security in your parking facilities should begin during the design of new facilities. If you are inheriting existing facilities, a security audit of all facilities is highly recommended.

The concept of "Crime Prevention through Environmental Design" (CPTED) provides useful tenets for architects, facility planners, designers, and law enforcement/security and parking professionals. Utilizing CPTED concepts helps create a climate of safety in a parking facility, on a campus or throughout a downtown, by designing a physical environment that positively influences human behavior. These concepts can also be used to retrofit environments to address specific security issues as they develop or to address emerging concerns as conditions change.

CPTED builds on four key strategies: territoriality, natural surveillance, activity support, and access control.

- Territoriality: People protect territory that they feel is their own and have a certain respect for the territory of others. Fences, pavement treatments, art, signs, good maintenance, and landscaping are some physical ways to express ownership. Identifying intruders is much easier in a well-defined space.
- Natural Surveillance: Criminals don't want to be seen. Placing physical features, activities, and people in ways that maximize the ability to see what's going on discourages crime. Barriers, such as low ceilings, solid walls, or shadows, make it difficult to observe activity. Landscaping and lighting can be planned to promote natural surveillance from inside a building and from the outside by neighbors or people passing by. Maximizing the natural surveillance capability of such "gatekeepers" as parking lot attendants, maintenance personnel, etc. is also important.
- Activity support: Encouraging legitimate activity in public spaces helps discourage crime.
- Access control: Properly located entrances, exits, fencing, landscaping, and lighting can direct both foot and automobile traffic in ways that discourage crime.

These principles can be blended in the planning or remodeling of parking facilities and other public areas. In parking environments, the following specific strategies are recommended:

Incorporate the following features into the design of new parking facilities:

- Higher floor-to-floor heights to improve openness.
- Glass backed elevators and glass enclosed or open elevator lobbies.
- Glass enclosed stairwells, perhaps open to the interior.
- "Blue Light" (or similar) security phones.
- Security screening on the ground level.
- Limit access at the parking facility perimeter to locations where patrons pass by the office or cashier booths.
- Eliminate potential hiding places (for example under stairs, within storage areas, etc.)
- Maintain low level landscaping.
- Insure that all your facilities are well lighted and meet or exceed the recommended minimums for parking facility lighting as established by the Illuminating Engineering Society of North America (IESNA). Develop facility lighting standards. Provide consistent lighting levels in all facilities.
- Integrate security offices, parking offices, retail shops, etc. into parking facilities to provide increased activity levels.
- Assess the use of CCTV, alarms, motion detectors and security patrols.
- Integrate parking attendants, cleaning and maintenance staff, shuttle drivers, etc. into your parking security program.
- Incorporate safety and risk management issues into a weekly facility walk-through checklist.

CHARACTERISTIC # 8: Effective Communications

Best in Class parking operations actively engage other community groups to help define how the parking system can best support the objectives of the businesses and the community at large that depend on a "parking system that works." As an outside consultant coming into a downtown or to a campus environment to evaluate some aspect of a parking program, it is not uncommon to find the parking system at odds with various customer groups. Although there may be as many reasons for this "disconnect" as there are personalities involved, there appear to be at least two primary underlying reasons:

- Other groups are focused on their own specific goals such as downtown revitalization, business recruitment or retention, patient care, leasing office or retail space, etc. They see parking costs as one element that places them at a competitive disadvantage with suburban competition or as a negative experience that disrupts patient schedules, etc. At the same time parking system managers are being pushed to increase revenues or decrease operating expenses or operate with a less than adequate supply of parking. The bottom line is they often lack a shared vision and therefore may be are pulling in opposite directions or simply do not understand each other's situation.

- The second major issue typically has to do with service level expectations. Downtown associations for example, tend to have higher expectations in the areas of customer service, facility cleanliness, security, etc. It is not that the parking system administrators do not value these same qualities, but there is a cost associated with providing these programs and limited

budgets to support them. The irony is that revenues are often reduced by not providing these higher levels of service.

The first step towards resolving this problem is improved communications and the definition of a shared vision/mission. A clear understanding of the issues and potential solutions is the kick-off point for developing the needed mutually beneficial approach. Developing a set of "Guiding Principles" for the parking system (discussed earlier) is a good starting point for crafting a successful collaborative relationship.

Successful programs also have well-defined relationships between various departments, especially other support departments such as: Maintenance, Enforcement, Security/Police, Communications, Facilities Management, Planning, etc.

Finally, successful parking programs are in touch with their customers and actively solicit input through meetings with key stakeholders, customer surveys, websites, parking "hot-lines" and public forums.

CHARACTERISTIC # 9: Consolidated Parking Programs

Taking a systems approach to parking is an important dimension to creating a comprehensive and effective parking program. Having control of all or most aspects of parking can contribute to a more effective operation, because of the interactive nature of parking as a system.

For example – having control of off-street, but not on-street parking can lead to problems if the rates for the various types of parking are not kept in the proper balance or relationship. Another example might be not having control over parking enforcement practices. This can hamper efforts to promote or improve turnover to support downtown retail or support special downtown events.

Ideally, the parking system should control all aspects of a parking system, including off-street, on-street and parking enforcement operations. In many cases parking systems also operate components of a complementary transportation program as well such as the downtown parking shuttle.

All parking related revenues should first go to fund parking programs, including preventative maintenance, maintenance reserves, parking system marketing, planning and new parking resource development. If additional revenues, in excess of operational needs are available, they should be banked as reserve funds for future parking development projects or returned to the general fund for discretionary spending.

CHARACTERISTIC # 10: Strong Financial Planning

The Parking System's financial expectations should be well-defined and clearly understood. For example, is the parking system expected to be a self-supporting entity, a profit/revenue center or a support service sustained by other primary revenue sources?

With the exception of airports, some university systems and some very large municipalities, most parking programs are not self-supporting. Many factors, including market rates for parking, parking mix

(percentage of transient vs. monthly parkers), availability of on-street parking revenues, availability of parking enforcement revenues, politics, economic development policies, etc. have an impact on whether a parking program can be self-supporting. For systems that cannot achieve true financial self-sufficiency, a common goal is for the parking system to cover all operational costs, excluding debt service costs. Debt service costs are typically subsidized by a general fund, tax increment financing revenues, in-lieu parking fees, or other sources.

An important principal in developing a successful parking program is that parking system revenues should be tied to the larger vision and mission of the downtown or environment it is intended to serve. Development of a strategic plan which incorporates not only market and land-use strategies, but also critical support infrastructure such as parking, transit, pedestrian access, freight mobility, loading and unloading, etc. is an excellent means for defining the relationships of all these components and establishing clear goals and direction. Once the vision and mission have been set, investigation of other possible sources of parking revenues may be desired. Alternative parking revenue sources might include:

- On-street pay parking (if that does not already exist)
- Parking Enforcement
- Tax Increment Financing Districts
- In-lieu-of Parking fees
- Special Parking Assessment Districts
- Etc.

Other important financial planning elements that are recommended for all parking systems include:

- Having a consolidated parking financial statement that tracks all sources of parking revenues and expenses.
- The parking program's revenues and expenses are well managed and its books are regularly audited annually or bi-annually.
- Annual operating statements are published in an annual report and available for public review.
- If a private parking operator is contracted to manage day-to-day operations, an annual parking operations and financial audit is recommended.

CHARACTERISTIC # 11: Creative, Flexible and Accountable Parking Management

This section encompasses so many potential topics it could easily be a whole book. Therefore, we will only attempt to touch on some key issues and principles.

One key principle is that different land uses, environments and user-groups require different parking management approaches. A one-size-fits-all approach does not work. A variety of parking management strategies are required to address different needs, such as:

- Visitor Parking
- Employee Parking
- On-Street Parking
- Reserved Parking

- Residential Parking
- Special Use Permits
- Event Parking
- Accessible Parking (ADA)
- Shared Parking
- Parking Allocation Plans
- Loading/Unloading Zone Parking

Another key management principal is the need for strong and accountable parking revenue control systems. This begins with the purchase and installation of a parking access and revenue control system specified to meet your system's needs.

It is important to understand all the components of the parking access and revenue control system and utilize them to their full potential. Many parking systems purchase expensive systems and use less than 10% of the system's capabilities. Using standard parking access and revenue control system reports and creating customized reports can provide enhanced management information, improved understanding of operational dynamics and ultimately increased system utilization and efficiency. An emphasis on training is a key to unlocking the system's capabilities. Another characteristic of effective parking programs is that they have well-mapped audit trails and developed processes to provide acceptable levels of control and accountability. Because of the large revenues generated, revenue control and accountability are key parking management issues.

Developing policies and procedures for anticipating and managing losses of parking supply (both temporary and long term) is another basic parking management responsibility. Some key elements in this area include:

- Planning for and communicating losses of parking supply
- Insuring adequate capacity to handle short-term parking supply losses
- Having effective plans to manage routine maintenance projects, including customer communications and contingency plans
- Having a full understanding of the financial impacts of these projects on revenue streams
- Having defined parking replacement cost policies is another recommended best practice.

Development of an "Annual Parking Report" can have a number of positive impacts for a parking system. It identifies key departmental issues and challenges, promotes departmental achievements, documents the "state of parking" to the stakeholders, creates a record of "system history", and builds credibility and confidence in the department.

Other parking management elements include:

- Well defined parking policies and procedures
- Development and maintenance of parking facility operations manuals
- Well defined and implemented facility maintenance programs
- Parking system marketing/branding programs
- Effective parking and wayfinding and signage programs

CHARACTERISTIC # 12: Operational Efficiency

Another important area to investigate when assessing a parking program is the overall efficiency of the parking operation. Parking system efficiency has several dimensions, depending on how the system is managed. The first area to be scrutinized is the management responsibilities of the system, i.e., what programs is the department or organization responsible for implementing. Once this has been defined, organizational structure and staffing plans are analyzed.

Development of some form of benchmarking or comparative analysis to measure costs and performance to similar operations is highly recommended. Understanding that benchmarking can be a tricky business – making sure you are comparing apples to apples, there are some basic benchmarks that make sense for a variety of parking operations. For illustrative purposes, a few basic benchmarks include:

- Parking revenue per space
- Total operating cost per space
- Administrative cost per space
- Maintenance cost per space
- Citations issued per enforcement staff (FTE)
- Parking citation collection ratio

Other operational areas can also yield significant savings in terms of reducing costs. Take, for example, facility lighting. Utility costs are integral budget elements in managing a parking structure, but by placing the exterior bay and roof top lights on separate circuits with photo-cells, 25 – 35% of the facility's lights can be turned off during the day, saving significant amounts of electricity on an annual basis.

Another area worthy of investigation is staffing costs in the late evening hours when the income generated is less than the staffing costs incurred. In these situations, the use of Pay-on-Foot applications or "Auto-Cashier Units" can be effective alternatives.

CHARACTERISTIC # 13: Comprehensive Facilities Maintenance Program

Few things make a greater impression on first time visitors than the cleanliness and maintenance of your parking facilities. Beyond first impressions, however, few areas provide a greater potential return on investment than a comprehensive parking system maintenance program.

A few best practices related to parking facility appearance and maintenance are noted below.

- Paint interior surfaces white to enhance the perception of cleanliness and safety and to improve lighting levels.
- Develop a comprehensive preventative maintenance program for all essential systems.
- Parking Access and Revenue Control System
- Elevators
- Lighting and Energy Management Systems

- Organize and track parking facility warranties in a binder. Schedule warranty inspections six months prior to warranty expiration. Document inspections with digital photos (ideally with time/date stamps) and written reports.
- Regularly schedule facility condition appraisals by an experienced parking consultant and develop a prioritized program of facility maintenance repairs.
- Set aside adequate maintenance reserve funds based on a prioritized facility maintenance action plan developed as part of your regular condition appraisal assessment.

There are four general categories of parking facility maintenance:

1.) Housekeeping – This work is typically conducted by in-house staff and consists of basic cleaning, sweeping, slab wash downs, etc. "Housekeeping" includes items such as:

- Sweeping of the stairs, elevator lobbies and floors on a regular basis.
- Trash collection on a periodic basis.
- Slab wash downs on a semi-annual basis.
- Floor drain cleanout (including sediment basket cleanout)
- Cleaning of stair enclosures (stair, elevator, and storefront glass)
- Cleaning of doors, doorframes and glass on a periodic basis.
- Cleaning of signage, light fixture lenses, elevator floors, doors, walls, parking equipment, etc. on a periodic basis.
- Cleaning of restrooms, cashier's booths, offices, etc. on a regular basis.
- Daily walkthrough of the facilities by operator to confirm that housekeeping is being performed.

2.) Systems Maintenance – This includes tasks necessary to ensure proper operations of systems and components. "Systems Maintenance" includes items such as:

- Landscaping
    - Maintenance – leaves, lawn, trees
    - Plantings (annual)
    - Fencing – posts, chains, etc.
    - Planters
    - Irrigation Systems
- Painting – spot or seasonal painting
- Parking Equipment Maintenance
    - Ticket spitters, card readers, computers, booths, gates, etc.
- Annual maintenance contract with equipment supplier
    - It is anticipated that parking equipment will be replaced every 7 to 10 years
- Fire Protection
    - A maintenance contract is anticipated
    - Drain the fire stand-pipe system periodically
    - Testing (twice per year)
- Lighting – It is anticipated that the lamps should be replaced every 2 to 3 years
    - Fixture repair and isolated replacement included in operations
    - Fixture replacement every 20 years (included in Capital Expenditures)

  - Lens replacement every 6 years (with lamps, included in operations)
  - Lamp replacement on an as need basis – Operator should schedule lamp replacement by level to maximize light effectiveness, and to maintain economy (Note: Lamp intensity depreciates significantly, well before burnout)
- Elevators - Elevator service contract and maintenance / repairs are generally provided by an outside maintenance firm
  - Periodic cleaning of equipment should be planned
  - Routine maintenance should be scheduled to reduce breakdowns
- Electrical / Mechanical / Plumbing Maintenance
- Offices / Restrooms / Cashiers Booths
- HVAC
  - Exhaust fans
  - Plumbing fixtures
  - Hot water heaters
- Lighting
- Electrical Equipment - General and emergency cleaning / maintenance
- HVAC Equipment – General and emergency cleaning / maintenance
- Mechanical ventilation
- Elevator tower ventilation system
- Emergency power / Lighting testing and maintenance contract.
- Generator: Maintenance contract.
- UPS System: Maintenance contract
- Plumbing - General cleanout
  - Domestic water maintenance
  - Drain wash down lines annually
  - Sump pump inspection
- Doors and hardware – Periodic inspection and lubrication (malfunction, sticking, etc.)
- Signage
- Illuminated Signs – Replace lamps
- Replace damaged signage periodically as required
- Snow removal / deicing

3.) Annual General Maintenance and Repairs – Annual general maintenance would usually be performed by outside contractors, although in some cases the operator's staff may perform the work. This work is not typically included in a capital cost budget, and may be combined with the System Maintenance category. "General Maintenance" would include items such as:

- Concrete Repairs - Isolated concrete slab, beam, joist, tee, topping, etc. repairs. In some cases, periodic concrete repairs (every 5 years) are included; however, isolated repairs between this interval should be anticipated.
- Masonry Repair – Isolated masonry repair should be anticipated (spot tuck pointing, damaged masonry unit replacement, resetting cap stone, etc.).
- Sealants/Expansion Joint – Repair/replacement of isolated sealant (floor and façade) or expansion joint failure (not included under 5-year warranty). Leaking at slab cracks may also require sealant installation. Leaking joints should be repaired as soon as possible after discovery, and evidence of leaking should be removed.

- Deck Coating - Isolated deck coating repairs (not included under the 5-year warranty). Wear of the topcoat should be repaired prior to damage to the underlying base membrane.
- Painting – Painting touchup (spot / seasonal painting) should generally be performed as damage is observed. It is anticipated that repainting of exposed steel and concrete surfaces would be performed every 10 to 15 years, and parking stripes reapplied every 2 to 3 years.
- Graffiti Removal – Graffiti removal should be completed as soon as possible after the application.
- General Electrical Repairs & Maintenance - Isolated corrosion damage, switchgear maintenance, panel maintenance.
- Light Fixture Repair / Replacement – Individual light fixture repair or replacement will require immediate attention.
- HVAC – Office, Restroom & Elevator HVAC repairs.
- Plumbing – Isolated replacement of drain lines and floor drain grates; isolated cleanout of drains / lines; Periodic sump pump repairs.

4.) Periodic Repairs, Protection, and Improvements (Capital Expenditures) This work is generally performed by outside contractors under the direction of parking consultants experienced in restoration and will consist of replacing/repairing damage to waterproofing or structural elements.
- Annual Maintenance Costs by Category
- Housekeeping, Operations & Operator Maintenance, will vary based on specific operations requirements, but will approximate $350 to $450 per space per year.
- Annual General Maintenance and Repairs costs will approximate $0.10 to $.15/sf per year ($35 to $50 per space per year), depending on condition and type of structural system.
- Periodic Repairs, Protection, and Improvements (Capital Expenditures) - The maintenance reserve fund can likely be lower during the first 10 years of life, and increased to accommodate improvement planning budgets. For a new structure, this item may range from $75 to $100 per space per year for the first 10 years.

CHARACTERISTIC # 14: Effective Use of Technology

"Best in Class" parking operations almost always have a comprehensive and integrated parking access and revenue control system that offers the following benefits:

- Consistent operations and features for customers.
- Simplified/consistent training for staff and auditors.
- Similar equipment and models that provide for simplified maintenance and less costly parts stocking.
- Consolidated system-wide reporting and management information.

Staying informed of new technologies can help provide the parking department with the best tools available to achieve its specific goals. New technologies can help you and your staff, "work smarter, not harder," thereby improving your efficiency and effectiveness. Customer service levels can also be enhanced using Automatic Vehicle Identification (AVI) systems, web-based permit renewal programs, pay-on-foot payment stations, etc.

Other benefits of incorporating new technologies are improved overall efficiency and effectiveness, reductions in operating expenses, improved management controls and the ability to implement seamless, customer friendly payment system options such as Internet payment options. These types of system improvements also improve the professional image of, and confidence in, the parking system. This, in turn, enhances the reputation and marketability of the community it serves.

CHARACTERISTIC # 15: Parking System Marketing, Branding and Promotion

In general, this is one of the most neglected and under-valued aspects of parking system management. An effective parking system marketing and branding program is one way to quickly set your parking operation apart from the typical. While this area is not usually a major focus area for hospitals and medical centers, there are several elements listed below that can be successfully applied. The following is a list of potential action items that can help launch a new, or enhance an existing, parking program:

- Develop a consistent Parking System Brand
  - The brand should promote the image you want people to have of the system.
  - A "brand" is more than a logo or tag-line.
  - The brand should reinforce the positive aspects of the system – "Free and Easy Parking," "Visit Downtown and Parking Is On Us" Downtown San Antonio...We've got a space for you," etc.
- Use consistent external signage to "tie the system together".
- Have a parking tie-in to most promotional materials.
- Expand and improve the parking system website. Provide useful links to related activities/supported areas or businesses served.
- Develop new employee/tenant parking brochures or info packets.
- Develop parking "E-Bulletins" to be distributed to monthly/contract parkers.
- Designate a parking spokesperson.
- Develop strategies for regular contact with customers, especially personal contact, between the parking manager and key stakeholders.
- Look for practical opportunities to connect the parking program to community initiatives, for example: develop parking deck floor identification (themed graphics, music, etc.) as an extension of a local public arts program.
- Develop cooperative relationships between public and private parking operations to effectively enhance parking supply in support of large public events.
- Develop a parking information database (including both public and private resources).
- Use your monthly parking billing system to distribute system info and promotional materials.
- Utilize "Guerrilla Marketing" (creative/low cost concepts) techniques.

CHARACTERISTIC # 16: Positive Customer Service Programs

All communities and organizations benefit when the parking system functions at a high level and contributes to positive customer experiences. Because parking is often the first and last impression customers have of a community/area, providing a high level of customer service is important not only to the parking program, but to the business interests it serves. When weighing the importance of customer service, consider these statistics:

- An average business never hears from 96% of its unsatisfied customers.
- On average, for every complaint received there are 26 customers with problems.
- The average unsatisfied customer tells 9-10 people about his or her problem.
- Customers who have had the problems solved tell, on average, 5 people.

A strong customer service program can provide the following benefits:

- Helps create a more "friendly" atmosphere.
- Improves the image of the Parking Department and the Community.
- Contributes to increased facility utilization (and therefore parking revenue, sales tax revenues, etc.)
- Contributes to increased acceptance of, and adherence to, parking regulations.

What are some characteristics of bad customer service?

- Indifference
- Unfriendliness
- Runaround
- "Joe Rule-Book"
- Not listening
- Getting the brush-off
- Just going through the motions
- No follow-up

What are characteristics of good customer service?

- Always be friendly and respectful.
- Allow customers to fully explain their situation, without interruption (let them vent).
- "Actively listen" to what your customers say.
- Ask questions seeking clarification.
- Maintain eye contact.
- If the customer is making a complaint, always apologize for the situation (and mean it!)
- Explain what you can do for the customer, not what you can't do.
- Always remember that tone of voice and physical movements convey meaning.
- Walk through the service process with the customer and explain the options.
- Help the customer understand the options and achieve a level of buy-in.
- Make sure they know you are there to help.
- Always conclude a service opportunity with a thank you.
- If possible, follow up with the customer to see if the solution worked and if they are satisfied.

Other recommended strategies to improve customer service include:

- Focus on employee training and good hiring practices.

- Hire friendly, attentive, outgoing, knowledgeable attendants.
- Increase personal contact between the parking system manager, stake holders and customers.
- Institute performance measurements and utilize the results for company and employee incentives.
- Create and implement a parking services program (battery jumps, lock-outs, flat-tires, escorts, audio book check-out, etc.)
- Implement a "Parking Hot Line" – (immediate response, centralized, easy to remember [555-PARK], and follow up!)
- Improve website and links (use as a customer service tool, i.e., provide opportunities to pay fines, obtain information - such as downloadable maps, rate schedules, special event info - etc.)
- Measure program effectiveness (customer surveys, etc.)
- Implement a secret shopper program to evaluate customer service.
- Implement customer friendly systems such as AVI, Valet Parking, etc.
- Develop processes to make it easier for larger organizations to get their employees into the system.

CHARACTERISTIC # 17: Special Events Parking

Coordinating parking for special events, almost more than any other parking management activity, requires a coordinated and cooperative effort with the larger community. Some of the keys to success in this area include the development of a well-defined special events policy and detailed systems for coordination of special events.

Another important dimension is the development of strong relationships with the key stakeholder groups that are active in the downtown. Providing practical incentives for other groups to communicate with and include the Parking Department in their planning processes early-on is critical. Examples of the incentives parking can provide includes special services such as: coordination services, parking validations or discounts, preferred or reserved parking, waiving of parking enforcement, etc. for those who participate in the special event planning process.

Finally, be consistent in providing those that work with the parking system a high level of service. Conversely, provide disincentives for those that ignore the special events parking policy or chose to not include parking in their planning.

CHARACTERISTIC # 18: Effective Enforcement

Having an effective parking management program requires that the rules and regulations be enforced. The key to an effective parking enforcement program is clearly defined and communicated regulations, attitude, consistency and fairness. Best in Class parking operations have adopted the philosophy of being customer focused not revenue or violator focused.

The following are enforcement program elements that help assure that your program avoids some common pitfalls.

- Define who sets enforcement policies and have an approved process for occasional review of assessment of enforcement policies.
- Make sure your parking enforcement policies are developed to achieve the specific issues that need to be addressed. For example, if promoting turnover of on-street spaces (reducing the frequency of long-term employee parking in on-street spaces) is the primary objective, ask yourself: Is your fine structure weighted specifically to achieve this objective?
- Evaluate the legal issues and specific laws or ordinances that support your enforcement policies.
- Define who is responsible for day-to-day parking enforcement. Have a central number that all customers and affected parties know to call for info regarding parking enforcement (eliminate the run around).
- Assure that parking rules, regulations and consequences are clearly posted.
- Assure that staff understand and can articulate the intent behind enforcement policies and regulations.
- Assure that if towing or booting is a possibility, the number to call for towed/booted vehicles is clearly posted.
- Clearly define and communicate how enforcement revenues are to be collected and used.
- Have a clearly stated process for adjudicating parking citations.
- Define who has the authority for towing, booting or other enforcement practices. (Generally speaking, this should be limited to one or two groups.)
- Make paying for parking citations as easy as possible.
- Provide incentives for early citation payment and disincentives for late or non-payment.

CHARACTERISTIC # 19: Parking and Transportation Demand Management

Because the cost of providing parking can be very high, strategies to manage parking demand are an important consideration in parking system planning. Incorporating parking and transportation demand management also ties into environmental goals and objectives such as the desire to reduce pollution, decrease traffic congestion, reduce reliance on single occupant vehicles, etc.

When evaluating options to reduce parking demand, one effective strategy is to integrate transportation demand management strategies into your parking program philosophy. A few best practices in this area include:

- Use parking rates as a tool to promote desired behaviors.
- Take advantage of employer-paid and employee-paid pre-tax benefit options.
- Promote carpool/vanpool programs.
- Provide preferential parking for carpools/vanpools.
- Subsidize transit passes for downtown employees.
- Provide a "Guaranteed Ride Home" program for those who participate in transportation alternative programs.
- Integrate bicycle racks and storage lockers in parking facilities.
- Show transit stops on parking maps.
- Provide remote parking options and promote park and ride options on the parking web site.

CHARACTERISTIC # 20: Awareness of the Competitive Environment

Another characteristic of effective parking programs is that they are keenly aware of their competitive environment. They actively monitor private sector parking operators for changes in rates, new services offered, new technologies being used, etc. One of the most fundamental practices that all parking programs should engage in is a formalized process for evaluating parking market rates. It is recommended that parking market rate surveys be conducted bi-annually to help maintain an awareness of the competitive climate. This information can also be valuable during annual budget planning.

Another dimension to staying competitive is being aware of what parking systems in other municipalities are doing. What has been tried? What has worked? What hasn't? Participating in national, regional and state parking associations, sending key staff to parking conferences and implementing the peer-review process discussed under the Staff Development section earlier are good ways of developing a network of contacts to help you stay up-to-date on the latest technologies and management practices.

In Summary…

The importance of Parking as one of the most visible and often controversial elements of an institution's infrastructure is often underestimated. Parking, when well-managed, can be a key component in attracting and supporting new business and is essential to sustaining a wide range of healthy and vibrant environments.

KIMLEY-HORN

Parking Planning White Paper Series

VALET Parking Program DEVELOPMENT

Kimley»Horn

Expect More. Experience Better.

VALET Parking Program DEVELOPMENT

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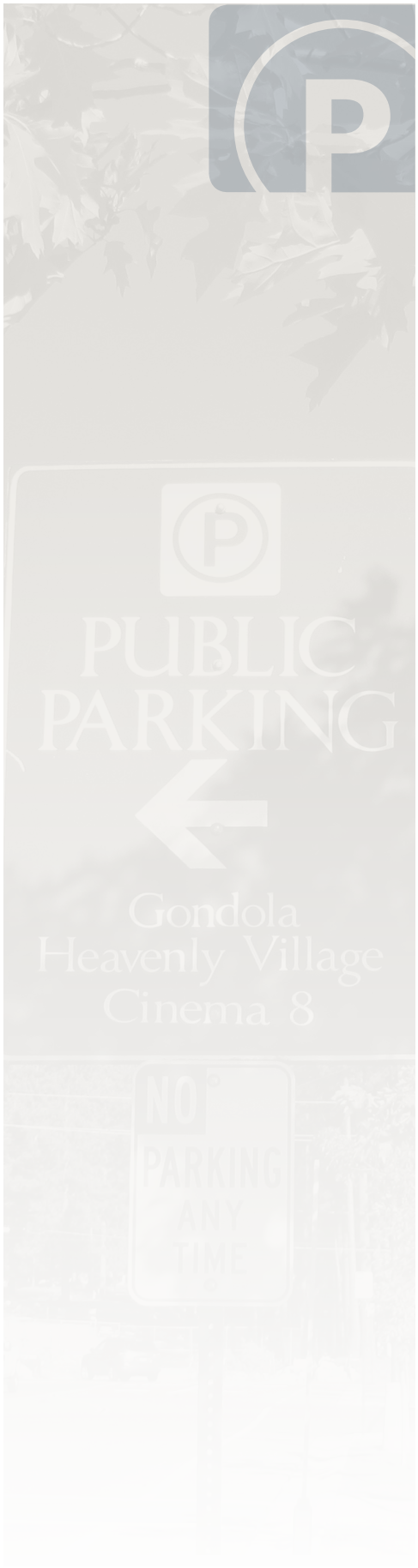


Valet Parking Program Development

The development of a valet parking program is not as simple a proposition as it might seem, especially if the operation is to be run in-house, by staff that has never previously performed this function. A number of programming and physical assessments must be evaluated.

Programming

- What is the nature of the clientele and the owner's expectations for service?
  - Will the service be limited or open to anyone?
  - Will some customers receive the service for free?
- Given the physical layout of the drop-off area(s), how many vehicles can be accommodated? Physical limitations can often be overcome by additional staffing.
- What are the service-level expectations of the facility served? (What is the minimum acceptable wait time for patron vehicle retrieval?)
  - What provisions can be made to make the wait more pleasant?
- What physical changes in traffic flow and parking might be required to make the system function well?

The worst thing that can happen is that an institution invests significant resources to market and implement a system that generates more customer complaints than compliments.

Operational Issues

The following operational issues should be included in a review of valet operations.

1. Evaluate parking layout:
   a. Efficient utilization of available space
   b. Ease of vehicle storage and retrieval–minimizing the number of vehicle movements
2. Plan vehicle circulation routes to reduce conflicts and delays in the parking and retrieval of vehicles.
3. Develop revenue control/ticket control procedure (not applicable if service is to be free) for:
   a. Effective revenue control
   b. Efficiency in ticket issuance, vehicle tracking, and vehicle retrieval.
   c. Special procedure or "stacked" spaces.

4. Staffing
    a. Planning and scheduling
    b. Contingency plans
5. Ensure effective communications between valet staff and client facilities operational staff.
6. Ensure effective communications between valet starters and runners (radio or cellular phone systems) to:
    a. Minimize lost time
    b. Minimize wasted travel time and energy
    c. Improve customer service
7. Proactively develop plans for restaging of parked vehicles to take full advantage of predictable departure patterns to reduce retrieval times.
8. Critically assess valet staging and queuing areas to:
    a. Minimize congestion and delays
    b. Minimize confusion and errors
    c. Determine physical configuration and dimensions of the available staging area for workability
    d. Develop operational procedures
    e. Determine contingencies for oversized vehicles
    f. Determine special provisions for, and control of, short-park vehicles not put into storage area (if applicable)
9. Evaluate typical "trouble areas," both physical and operational, which may be affecting operational efficiency and liability. For example:
    a. Unusual delays in vehicle retrieval
    b. Retrieval of the wrong vehicle
    c. Customers failing to leave keys
    d. Lost keys incidents
    e. Vehicles "lost" in the system
    f. Vehicles retrieved out of sequence
    g. Actual damage incidents
    h. Claimed damage incidents
    i. Actual theft incidents
    j. Claimed theft incidents
    k. Stolen vehicle incidents
10. Thoroughly assess potential liability issues:
    a. Maneuvering hazards in the facility
        i. Blind spots
        ii. Pedestrian/vehicular conflicts
    b. Customer liability
        i. Transferring of patients from vehicles to wheelchairs
        ii. Custody documentation procedures and practices

iii. Legal language on signage and tickets
iv. Procedures for noting and recording damage
v. Procedures for vehicles with valuables exposed
vi. Physical security within the facility

11. Carefully review potential customer service issues:
    a. Identification and alignment of client expectations and operator objectives
    b. Special demands of the specific location
    c. Customer expectations vs. service provided
    d. Marketing the service – getting the word out

Operations Checklist

The following is a detailed operations checklist that may be valuable when considering the creation of a new valet parking operation or the evaluation of an existing program. This checklist provides an indication of the level of detail that needs to be addressed before a valet operation is implemented.

Physical/Functional Issues

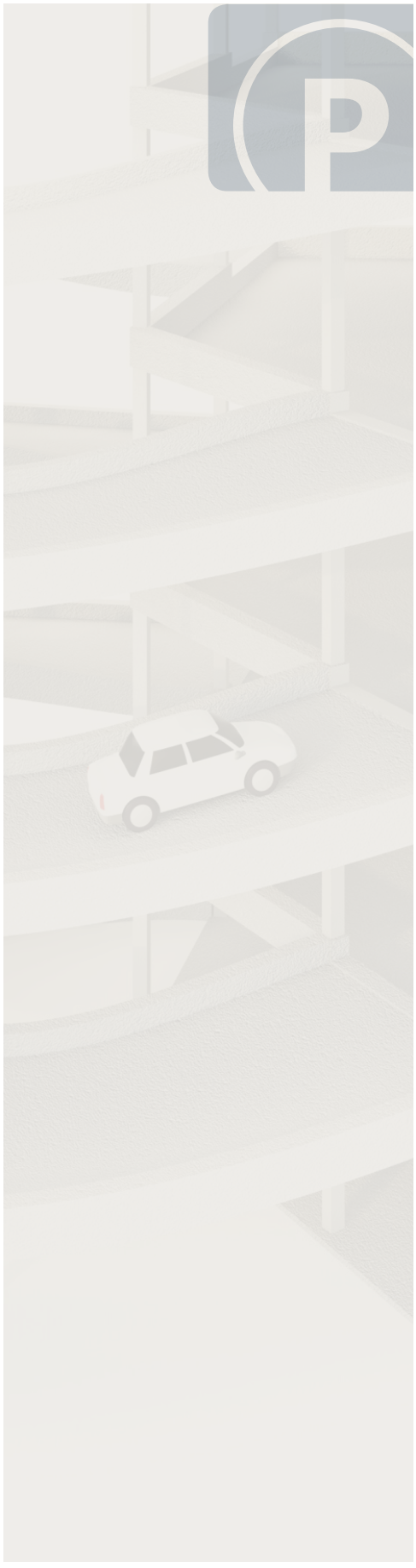
1. How close is the primary vehicle storage area?
2. How long does it take a runner to walk the distance? How long to run it?
3. Is the valet area separate from self-parkers to avoid damage?
4. If the valet storage area is separate from self-parkers, how is it controlled? Does that control keep self-parkers out of the valet area?

Valet Stack Parking

5. Is "valet vehicle stacking" required to achieve sufficient storage?
6. If stacking is used, what is the pattern?
7. What is the minimum number of vehicles that must be moved to retrieve a single car that is "buried"?
8. What is the maximum number of vehicles that might have to be moved to retrieve a single car that is "buried"?
9. What percentage of stored vehicles are "buried" when the valet storage area is full?
10. What is the "normal" filling level of the valet storage area and, under normal filling, what % of stored vehicles are "buried" vs. first car accessible?

Operational Issues

11. What is the maximum number of vehicles that are likely to arrive within any given 30-minute period?
12. What is the normal number of runners available at peak times?
13. How much queuing space is available at the front drive?



14. Do self-parkers also end up on the front drive?
15. If so, can something be done to remedy that?
16. Given the number of runners on duty, how many arrivals at one time will it take to fill the front drive (after all runners have taken a car)?
17. If the primary storage area is too far away, is there an intermediate stacking area available for "emergency" overloads of the front drive?
18. Develop procedures to ensure that customers do not drop off their cars without leaving their keys.
19. Does the starter have possession of the keys or car (with keys) before giving the customer the receipt?
20. Discourage leaving cars in the drop-off area with keys still in the cars.
21. Ensure that keys are secured at all times and that key access is restricted.
22. Develop strong policies for tracking tickets and keys.
23. Develop procedures to "re-stage" (repark) cars for more expeditious vehicle retrieval, especially during peak demand periods.
24. Develop effective procedures for tracking vehicle location changes if "restaging" is used.
25. Perform periodic verification of ticket locations against vehicle locations.
26. Ensure that procedures are in place requiring the starter or runner to check vehicles for damage prior to taking custody. One best practice for larger operations is to utilize video to document vehicle conditions upon drop off.
27. Ensure vehicle inspections occur consistently to reduce liability.
28. Develop effective policies and procedures regarding documentation of valuables left inside cars at the time the valet accepts custody.
29. Ensure that during busy periods valet staff control where arriving parkers stop their cars to maintain traffic flow and patron safety.
30. Have contingency procedures in place to address abnormally high in-bound traffic volumes.
31. Whenever possible, develop procedures to improve operational efficiency such as delivering vehicles to storage and returning a vehicle for pick-up using a single trip.

32. When establishing routes from the drop-off area(s) to the vehicle storage areas, identify the shortest and most effective routes possible. Avoid intersections or high traffic areas that can introduce complications and delays whenever possible.
33. Select valet uniforms that are appropriate for local/seasonal weather conditions.
34. Create a defined policy on solicitation of gratuities.
35. Create a defined policy on staff uniforms and grooming.
36. Develop strong pre-employment hiring policies regarding background and driver's license checks.
37. Require all starters and runners to submit an updated driving record every six months.

Vehicle Damage/Liability

38. Ensure that valet tickets provide a graphic aid for noting damage upon vehicle acceptance. All damage noted should be confirmed with the customer before the vehicle is accepted.
39. Create a defined policy regarding discipline and employee retention related to damage to customer vehicles.
40. Create defined procedures to address the reporting of damage to vehicles including policies on what to do when damage is not properly reported.
41. Create a defined procedure for when a customer reports damage to their vehicle.
42. Create a defined procedure for when a customer reports damage to their vehicle after the vehicle has left the premises.
43. Whenever possible utilize video-recording camera systems to document pre-existing vehicular damage.

Valet Management Systems and Special Programs

44. Leverage new automated valet parking management systems to track and manage keys, tickets, and revenues.
45. Ensure that high-quality operational and customer service staff training programs are in place.
46. Evaluate the benefits of enhanced customer service features, such as:
    a. A "Valet Express Park" program – Allows customers to notify valet attendants that they are returning to expedite the vehicle retrieval process.
    b. A "First Visit Complimentary Valet Program" – Generally used for complex or challenging facilities or campuses to provide a positive first impression and education on how to park on future visits.
    c. VIP Parking Program – Generally used to reward regular program users and to promote customer or vehicle identification through patron name recognition and the offering of special perks.

d. Operations tracking and monitoring – This management strategy can be employed even without an automated parking system, but it is much easier with one. Tracking data on vehicle arrival/departure patterns and volumes, vehicle processing times, damage claims, individual valet staff productivity, etc. can be very valuable and lead to significant program operational enhancements.

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Appendix 3

Sample Parking Administrator Position Descriptions

Appendix 3

Sample Parking Administrator Position Descriptions

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INTRODUCTION

As part of this parking strategic plan ***Kimley-Horn*** has researched and developed this parking administrator position description document and supporting examples. The following outlines the contents of this research:

- Research Parking Administrator position descriptions with a goal of providing the City with examples of variations in terms of scope and range of responsibilities.
- Research salary range variations
- Develop a recommended position description as the basis for refinement in conjunction with the City of Norman
- Research recruitment strategies for this type of specialty position (where ads have been placed, use of customized brochures, use of national and regional parking organizations, website, publications, use of national recruitment resources [Monster.com] etc.).
- Provide examples of recruitment ads.
- Develop a recommended recruitment ad.
- Develop an outline of the recommended recruitment process.

Research – Chief Parking Administrator Position Descriptions

Kimley-Horn pulled together roughly 50 job descriptions and advertisements for parking administrators, managers, directors, and so forth. From those, very good samples are illustrated by: The University of North Carolina at Greensboro, The Wilmington Parking Authority, City of West Hollywood, City of Hoboken, City of Sacramento, City of San José, and the City of Hollywood, FL. These samples are included at the end of this document.

Essential and Non-Essential Job Functions

The following table lists many of the common job functions found in Chief Parking Administrator position descriptions collected by ***Kimley-Horn.*** A recommended position description is provided later in this document. Another task that will need further refinement and the input of the City's Human Resources department is the categorizing of "Essential and Non-Essential" job functions. This process is recommended to better equip the City in dealing with ADA guidelines.

When evaluating whether a job function is considered "essential" or "non-essential" the following criteria should be applied:

- Whether an employee in the position is required to perform the function;
- Whether removing that function would fundamentally change the job;
- The frequency with which the function is performed;
- The amount of time spent on the function;
- The consequences if the job is not performed.

These considerations may help determine if the duty is truly a requirement vs. simply a desirable function in the position.

Essential Job Functions	Non-Essential Job Functions
Carries out managerial responsibility in accordance with policies, procedures and applicable laws, including: interviewing, hiring and training staff; planning, assigning and directing work; establishing deadlines; appraising performance; rewarding and disciplining employees; coordinating, developing and approving staff training; and addressing complaints and resolving problems.	Develops the Department budget; has full responsibility for the implementation, revision, and compliance review of the Department's budget.
Plans, coordinates, assigns, and monitors performance and coaches, counsels, mentors, trains, and advises employees in department for the dual goals of meeting department goals and employee career development; assists staff in the completion of assigned tasks.	Maintains and upgrades professional knowledge, skills, and development by attending seminars and training programs and reading trade and professional journals and publications.
Researches, develops, interprets, communicates, and monitors policies, procedures, codes, standards, etc.; recommends improvement when necessary and writes/revises same.	Interacts with a variety of high level individuals, both internally and within the community to provide information, disseminate departmental

Essential Job Functions	Non-Essential Job Functions
	information and assist in resolving administrative issues.
Manages the planning, acquisition and development of parking projects/facilities; coordinates functions with other City departments, public agencies, constituents, etc.	Follows up on inquiries from various agencies, groups, media, etc., regarding department programs and services.
Prepares work programs; identifies projects, funding needs and time frames.	Disseminates a variety of information to various agencies, divisions, or departments via telephone, mail and facsimile.
Determines methodologies, data, information resources and techniques to be utilized in researching and developing programs and policies.	Authorizes purchases and expenditures of the Department.
Directs the preparation of studies and reports related to division operations by developing proposals and recommendations and providing technical assistance.	Oversees daily activities of Department personnel.
Plans long-range goals, objectives, management systems, organizational structure, and overall direction for the division; plans and implements short-term or annual goals, objectives, strategies, projects or programs to ensure efficient organization and completion of work.	Oversees contract personnel, and Department contracts and bid awards.
Coordinates division activities with other departments, divisions and/or outside agencies; responds to citizen inquiries.	Reviews and authorizes Department's payroll.
Serves as technical resource on division operations.	Performs employee performance evaluations, and reviews evaluations performed by subordinate staff.
Prepares and/or reviews complex reports and analysis utilizing a variety of software; receives, sorts, and summarizes material for the preparation of reports; relays and interprets administrative decisions, policies and instructions.	Coordinates City's parking needs with other city departments and governmental agencies.
Represents the City and/or serves as a liaison and/or member of various committees/teams and collaborates, persuades, presents reports to and negotiates with others outside own work area to coordinate efforts and maintain cooperative and efficient relations.	Conducts feasibility studies to determine the need for additional parking facilities, rate changes or adjustments, and the development of new residential parking programs and monthly parking programs.
Prepares reports and make presentations to various boards and commissions.	Reviews daily collection records and prepares monthly reports of revenues and expenses for the Mayor and City Council.
Ensures quality standards and compliance with regulations are maintained.	Develops Department policies and procedures.

Essential Job Functions	Non-Essential Job Functions
	Reviews City Ordinances to insure that they comply with state statute, rules and regulations.
	Performs other related duties as assigned.

It is our expectation that City staff can take the lead on refining the ultimate list of essential and non-essential job duties for this position.

Salary Ranges

The International Parking Institute publishes a study entitled, "The Statistical Guide to Parking: Benchmarking the Parking Industry." IPI provides technical and educational services to the parking profession. Members of IPI include municipalities, colleges and universities, airports, hospitals, theme parks, commercial parking operators, suppliers to the industry, parking consultants, and others with direct interests in parking and transportation operations.

One of the goals of the survey was to identify compensation ranges for parking professionals. The average salary for Parking Administrators on a nationwide basis was $82,224. Average number of years in this position was 9.8. Parking Administrators have oversight responsibility for most parking functions.

Chief Parking Administrator	U.S. Total	Northeast	Southeast	North Central	South Central	Northwest	Southwest
Average Annual Salary	$82,224	$80,800	$79,700	$83,614	$80,801	$75,504	$86,894
Average Years in Position	9.8	11.3	9.7	10.6	9.0	12.3	7.2

Chief Parking Administrator	Type of Parking Operation				Annual Parking Revenue (Millions)				
	Airport	College / University	Medical	Municipal	< $1	$1-1.9	$2-3.9	$4-9.9	$10+
Average Annual Salary	$85,913	$83,006	$79,479	$80,049	$48,348	$56,953	$69,895	$74,290	$81,878
Years in Position	11.3	9.8	14.3	9.4	7.8	9.5	8.9	10.8	9.2

We contacted the developers of the IPI *Benchmarking* survey instrument and database, and asked them to provide us with specific salary information for parking system administrators that manage the full range of parking responsibilities envisioned for the reorganized parking program in Norman. That information appears in the table below.

Parking Administrator Survey Data

Total System Employees (In-House or Contract)	Chief Parking Administrator Salary	Chief Parking Year in Position
98	$116,655	11
520	$150,164	1
185	$112,000	Data Unavailable
10	$89,709	Vacant
34	$106,393	Data Unavailable
15.75	$97,000	2.5
14	$116,069	1.08
32.5	$97,188	6
67	$92,000	27
110	$80,880	Data Unavailable
140	$82,000	4
60	$77,000	1.5
Average:	**$101,421**	

Recruitment Strategies

A. Networking

1. Networking is probably one of the most successful and least costly means of recruiting employees. Listed below are several areas that should be used to network and find future employees. Networking is a powerful tool and can have both positive and negative results. A casual conversation regarding the working conditions, fellow employees, or morale can have long-term effects on many people.

2. Do not be bashful about declaring your desire to recruit from competitors and contractors. When a vendor is in the office, tell about vacant positions and encourage them to recommend someone. Remember who the quality people are and keep in touch with them.

- Professional Societies
- Previous Employers
- Competition
- Colleges and Universities
- Neighbors and Friends
- Contractors
- Vendors
- Trade Shows

B. Advertisement

1) Local Print Ads

2) National Print Ads

a. Advertisements in the major Parking magazines are a highly recommended strategy. Specifically – The International Parking Institute's monthly publication - The Parking Professional, The National Parking Association's monthly publication – Parking Magazine and a third parking publication known as Parking Today. These publications are listed in order of their recommended priority. Position posting in some of these publications also come with or have an optional web-site listing.

C. Selected Mailings

1) Use of local and national advertisement along with select mailings may be a very effective tool in the recruitment process. Standard ads should be available from Human Resources for placement in both local and national publications. These ads can easily be customized to your specific requirements. The national ads, by nature, are more expensive than local ads and are most effective in advertising positions that cannot be filled regionally or positions that are available at multiple offices. An additional possible cost with national advertisement is relocation of the new employee.

2) Selected mailings entail targeting a specific group; it may be recent college graduates, or members of a technical committee. These mailings should be personalized in some way

to prevent the look of a form letter. It may be more effective to target a group by placing an ad in their newsletter or sponsoring one of their meetings.

D. Internet

1) Web Page

a. The City of Norman's Human Resources' web page is an important recruitment method. Many job descriptions, salary information, and employment information are available. The web page must remain up-to-date to present a positive, dynamic image of the City.

2) Services

3) Internet employment service companies abound. The track record and success rates for these firms are not publicly available and you must rely on the marketing material from the individual services as a gauge.

4) Colleges and Universities

5) Co-operative (summer) Students

6) On-Campus Recruitment

7) Relationship with Parking Department

8) The college recruitment process is an excellent source for potential employees. Colleges should not be viewed solely as sources for entry-level candidates, as many college recruitment offices are a resource for alumni throughout their careers. Additionally, many highly experienced individuals pursue advanced degrees and are looking for new opportunities that may not be available with their present employer.

9) Seek out the schools in your area that are educating the types of people that we have identified a need for. Request that Human Resources determine the schools' on-campus recruitment schedules and how we can become involved. Many trade shows have representatives from the colleges. Seek them out and let them know we are looking for qualified candidates from their school. Be active in alumni associations.

E. Headhunters

1) The cost of a headhunter is often perceived to be very high (20 to 30% of the first year's salary). The cost of finding qualified candidates is also high when you consider the time and money we spend collecting and screening individuals and the cost associated with lost opportunity because we do not have the qualified individuals available. Therefore, you should strategically employ headhunters for filling high need positions or when our traditional search methods do not bear fruit.

2) Remember that the headhunter business is a business and that their rates are always subject to negotiation. Also, it is suggested that the fee be prorated over a period of time and, if the employee is terminated during the defined period, the fees are also stopped or refunded.
3) Passive Versus Aggressive Headhunters
    a. There are two types of headhunters; the passive and the aggressive headhunter. The passive headhunter usually has a database of résumés from which it will research and recommend. Additionally, they will often run blind advertisements for positions. The aggressive headhunter will also research their database, but they will actively recruit candidates from other firms. The aggressive headhunter's fees are usually higher and the potential for them turning around in the future and raiding your employees is present. An "anti-raiding" agreement must be part of any contract you enter into with this type of headhunter.
    b. Both types of headhunters can be effective and have their own positive and negative points. They should be viewed as a viable method for recruitment on a limited basis, with prior approval of the Mayor due to their high cost.
    c. Temporary Agencies
        i. Temporary agencies are excellent sources for balancing the peaks and valleys in your workload; however, for this position level, they are not applicable.
    d. Job Fairs
        i. Job fairs can be associated with a specific organization such as a college or chamber of commerce, or they can be sponsored by a group of interested companies. Participation in job fairs is a grueling task. The pace is usually very frantic and determining the viability of a candidate is often difficult. These fairs should be viewed as a source of advertisement of vacant positions and a method of collecting résumés.

F. Employee Recruiting Bonus

1) A recruiting bonus system is a good way to engage the existing work force in active recruitment. This system has had positive benefits. Everyone all should continue to celebrate the success derived from a recruiting incentive bonus system.

Examples of Recruitment Ads

EXECUTIVE DIRECTOR ALBANY PARKING AUTHORITY, ALBANY, NY The Albany Parking Authority is seeking an experienced professional to lead and direct all aspects of the public parking system. The selected individual will be responsible for continuing a comprehensive plan and implementing parking policies in New York's capital city. Increasing downtown development will require a keen sense of administration, budgeting, personnel management, and day-to-day responsibilities for more than 2,650 parking spaces in three garages and 2,000 on-street meters. Ability to coordinate activities with City of Albany departments, including the Police Department which provides parking enforcement, and Business Improvement Districts, is essential. Qualified candidates must have a minimum ten years of progressively accountable parking operational experience, and at least five years in a responsible management position. To be considered, candidates will have graduated from an accredited college or university with a Bachelor's Degree in Business Management, Public Administration, Transportation, Economics or related field. Extensive professional parking management experience may be substituted. Salary will be commensurate with experience. Candidates are invited to send a letter of interest and current resume with salary history to: Albany Parking Authority 655 Broadway Albany, NY 12207 ATTN: Executive Director	COORDINATING DIRECTOR FOR THE HUNTINGTON MUNICIPAL PARKING BOARD IN HUNTINGTON, WV Work involves responsibility for the overall operations of the Parking Board, including supervision of all employees and management of fiscal operations. Bachelors' degree in business administration or related field preferred and extensive management experience. Valid driver's license required. City residency required within 90 days of hire. Salary negotiable. Excellent benefit package. Send resume to Personnel Director, P.O. Box 1659, Huntington, WV, 25717, by 01-31-05.

PARKING MANAGER Tampa/Fort Myers, Florida Salary Negotiable: $40,000 - $50,000 Standard Parking Corporation is currently recruiting for the position of Senior Parking Manager to manage and operate all aspects of a municipal public parking system on Florida's gulf coast. Preferred candidates should have a Bachelors degree in Business or Public Administration and at least 5 years of experience working in a municipal, governmental or institutional environment as a supervisor, manager or director or a combination of education, training and experience. CAPP certification desirable. Experience should include garage operations, event parking, parking meter collections and repair, parking enforcement and parking citation processing. Candidates must have excellent leadership, communications, and management and customer service skills. Please email or fax your cover letter, résumé with references and salary requirements to: Brain P. Scoggins Business Development Director Standard Parking Corp. 201 S. Orange Ave. Orlando, FL 32801 Phone: 407-947-2109 Fax: 407-423-7277 E-mail: bscoggins@standardparking.com	DIRECTOR PARKING SERVICES PUBLIC SAFETY Control number 24UC1174 Salary range: $41,438 - $74,578 (based on experience) POSITION SUMMARY: Plan, control, maintain and direct parking operations for East (Medical Center) West (Main Campus), as well as CAS branch campus, and to resolve user concerns. The operation covers over 115 acres and over 11,150 parking spaces which includes 9 garages and 10 lots. There are approximately 65 FTE and 30 part-time employees. Monitor, repair, and maintain integrity of parking facilities. Develop and implement policies and procedure for Parking Services and in coordination with other university units as well as private units. Manage, develop and strategically plan for special events as well as basketball/football and CCM events crowds. Enforce parking rules and regulations. Assist in projects; analyze budget to assure revenues meet expenses and efficient utilization of resources. Plan, develop future parking facilities. Project demand for capital projects that impact parking and assist in implementation of the University Master Plan. Interview, select and evaluate performances of support staff. Chair or severe on Parking Committees. Oversee the snow removal on East/West and CAS campuses. Responsible for budget over $13 million. MINIMUM QUALIFICATIONS: Bachelor's degree with five (5) years' experience; -OR- Associate's degree with seven (7) years' experience; -OR- nine (9) years' related experience. Experience must include at least three (3) years' experience in Parking/Traffic Services. Send résumé (including position control #) to: Denise Samuels Gibson Department of Public Safety University of Cincinnati PO Box 210790 Cincinnati, OH 45221-0790

EXECUTIVE DIRECTOR PARKING AUTHORITY OF BALTIMORE CITY The Parking Authority of Baltimore City is a quasi-governmental agency that is a national leader in the use of technology and innovation to parking operations. If you are highly motivated, creative, and driven to excel, we now have an immediate need for an Executive Director. This highly visible position reports to a 5 member Board of Directors and serves as a member of the Mayor of Baltimore's Urban Development Cabinet. The ideal candidate will have senior management level experience in parking operations, experience working with governmental agencies and citizens/business groups, be responsible for the development/implementation of the Parking Authority's strategic plan and implement short and long term organizational goals. The successful candidate will oversee all aspects of Baltimore City's parking operations, which includes 38 parking facilities with close to 100,000 spaces, over 10,000 on-street metered parking and more than 33,000 residential parking permits. An individual with a strong entrepreneurial sense, coupled with outstanding communication skills and a keen customer service outlook, will help lead the Parking Authority of Baltimore City into 2005 and beyond. Salary in the low $100ks. Résumé without salary history and references will not be accepted. Send resume to: PABC Board of Directors Attn: David W. Wallace, P.E. 81 Mosher Street Baltimore, MD 21217 E-mail: dwallace@rkkengineers.com E.O.E.	ASSOCATE DIRECTOR FOR TRANSPORATION SERVICES / PARKING SERVICES ADMINISTRATOR University of California, Los Angeles UCLA offers an exciting opportunity for knowledgeable and innovative manager to take a leading role in providing transportation and parking services for a campus community of over 60,000. UCLA Transportation Services manages over 22,000 parking spaces with over 120,000 daily vehicle trips to and from our Westwood campus. This high profile, politically sensitive department serves a diverse campus constituency of staff, faculty, students, patients and visitors. The Associate Director will provide leadership and direction to a management staff overseeing 50 separate facilities in 7.5M square feet, while balancing competing user needs and service issues with prudent business practices which impact performance, community relations, safety/security, and employee/customer satisfaction. The successful candidate must possess the political and business acumen to steer this highly visible department on a course of continuous improvement and service excellence, while maintaining a strong financial outlook. Requires prior managerial experience and skill in supervising, managerial professional and frontline staff including delegating responsibility, recruiting, training, conflict resolution. Also requires exceptional skills in resource management, long term planning methodologies, contract negation, product distribution processes, cash management, and revenue control, performance management and the use of "best practices" in business, service and financial management. Knowledge of leading edge parking technology; planning of traffic direction flow and circulation; planning for construction and financing of new and replacement facilities preferred. Continued employment contingent on satisfactory background investigation. Starting

	salary up to $105K DOQ, plus excellent benefits package. Please submit résumé with salary history and cover letter to: drowley@ts.ucla.edu or mail to D. Rowley, UCLA Transportation Services, 555 Westwood Plaza, Suite 100, Los Angeles, CA 90095-1360. EOE/AA.

Recommended Recruitment Ads

The City of Norman, OK, with a population of more than _____ (Census 2017), is seeking a dynamic and skilled Parking System Administrator. This high-profile position will report directly to the _____ and be responsible for administrative and technical work in organizing and managing the municipal parking system. The primary responsibility consists of integrating all parking functions into a single, vertically integrated department, providing effective management of public resources, being collaborative in working the downtown community and managing public parking resources in the a cost effective manner.

The Parking Administrator will organize and consolidate parking operations into a unified department and will implement a range of operational improvements identified in previous studies. The Parking Administrator will oversee a large budget and will conduct feasibility studies to determine needs for additional parking facilities and other structural and operational changes.

The Parking Administrator will work closely with community leaders and organizations to build support and consensus on the development of new parking management goals and program initiatives.

The desired candidate must have demonstrated success in managing a parking department, authority or private parking company. Experience working within a municipal environment is helpful. Ideally, the new executive would have a combination of public and private sector experience, a high level of motivation and an entrepreneurial spirit. Having system "start-up" experience is seen as valuable asset.

The Parking Administrator is responsible for the Department's participation in the City-wide strategic planning process, which has increased focus on customer service, employee development and recognition, cost containment, revenue enhancement, and embracing diversity. The Chief Parking Administrator is a participant in the Downtown Master Planning process and will be a member of the City's Economic Development team. He/she must be forward thinking and creative.

The selection committee is seeking an individual with excellent leadership, organizational development, contract management and interpersonal skills, who is innovative and capable of developing a "best in class" municipal parking system. Experience in a complex urban ethnically-and-culturally-diverse community is important for this position. The successful candidate must possess a track record of proven accomplishments in the operation of complex parking systems. This candidate must be a community-oriented executive with a history of building partnerships among businesses, developers, and residents.

Compensation: $____ to $____ annually, with a midpoint of $_____. The starting salary is commensurate on candidate qualifications.

Outline of Recommended Recruitment Process

- Finalize position description.
- Establish closing date for receipt of résumés.
- Finalize recruitment ad(s).
- Define recruitment timeline.
- Identify primary and secondary advertisement media.
    - National Parking Magazines and Websites
    - International Parking Institute / Parking Professional Magazine (Primary)
    - National Parking Association / Parking Magazine (Primary)
    - Parking Today Magazine (Secondary)
    - City of Norman Internal Job Posting and Website
    - Local and Area Newspapers (Defer to City of Norman HR)
- Review and screen résumés. It is proposed that the City of Norman HR do the initial screening and forward copies of screened applicants to the consultant (Kimley-Horn) for review.
- Cut to a group of 5 - 10 (+/-) qualified applicants.
- Conduct reference checks. (Typically this is done after a candidate has been interviewed and is under serious consideration.)
- Complete supplemental questionnaire by more-qualified candidates. (Optional)
- Interview selected candidates. (Kimley-Horn can attend interviews as a non-voting panelist if desired.)
- Cut down to a group of four semi-finalists.
- Project team screening of semi-finalists.
- City of Norman Human Resource Department may have requirements in this process (credit/background checking? MVR checking? Drug Testing?).
- Appointment of Chief Parking Administrator.

The Ideal Parking Administrator

The new Parking Administrator in the City of Norman needs to be knowledgeable and experienced in dealing with high density, urban parking issues, in a setting where parking is a high profile activity. Additionally, this will be a person who:

- Can effectively bring all the elements together to develop a comprehensive parking strategy for the City.
- Has proven experience in developing off-street parking.
- Brings an entrepreneurial approach to the position.
- Is a high-energy person, a proven parking professional, and is ready to expand her/his expertise.
- Is familiar with the economics of parking as well as financing options and possesses the skills to develop new parking resources.

Sample Position Descriptions

CITY OF HOLLYWOOD, FLORIDA

DIRECTOR, OFFICE OF PARKING SERVICES
CITY OF HOLLYWOOD, FLORIDA

The City of Hollywood, Florida, a multi-cultural, oceanfront municipality between Miami and Ft. Lauderdale, with a population of 143,000 is seeking a dynamic and skilled Director, Parking Services. This high profile position will report directly to the City Manager and be responsible for administrative and technical work in organizing and managing the municipal parking system. The incumbent's primary responsibility consists of providing and maintaining the maximum number of public parking spaces in the most cost effective manner. The employee also oversees a large budget, supervises the parking division personnel and conducts feasibility studies to determine needs for additional parking facilities, and other structural, operational changes.

Hollywood's population demographics are changing rapidly. The City values this emerging diversity and needs to be responsive to changing needs in communications and services to all parts of the community.

The Director, Parking Services is responsible for the Department's participation in the City-wide strategic planning process which has increased focus on customer service, Urban Development, employee development and recognition, cost containment, revenue enhancement and embracing diversity. The Director, Parking Services is a participant in the Master Planning process and is a member of the City's Urban Development roundtable; s/he must be forward thinking and creative.

The City Manager is seeking an individual with excellent leadership, organizational development and interpersonal skills who is innovative and capable of developing the next generation of municipal parking system service professionals while maintaining high performance standards. Experience in a complex urban ethnically and culturally diverse community is essential for this position. The successful candidate must possess a track record of proven accomplishments in the operation of municipal parking systems. This candidate must be a community-oriented executive with a history of building partnerships among businesses, developers and residents.

The Director, Parking Services will be an integral part of the City Manager's executive team. Starting salary negotiable DOQ.

Requirements:

Bachelor's degree from an accredited college or university with major course work in public administration or business, supplemented by extensive supervisory experience in parking administration; or an equivalent combination of training and experience. Certified Administrator of Public Parking (CAPP) is beneficial.

This position will remain open until filled, initial reviews of candidates will commence on Friday, April 8, 2005. Please send resume and salary history to:

City of Hollywood
Office of Human Resources, Rm. 206
P.O. Box 229045
Hollywood, Florida 33022-9045
On line at www.hollywoodfl.org

All resumes are open to public inspection. Equal opportunity employer, minorities and protected class members are encouraged to apply.

Sample Position Descriptions

CITY OF HOBOKEN, NEW JERSEY

JOB DESCRIPTION

PARKING EXECUTIVE DIRECTOR

NATURE OF WORK

This is a chief executive management and administrative position responsible for the planning and organization, of the Municipal Parking System. The incumbent's job responsibilities include:

- Parking facilities planning, development and construction
- Traffic management and improvements.
- Integration of shuttle bus service into parking/transit system.
- Overall supervision and direction of traditional parking services including: parking enforcement; meter maintenance, collection and installation; parking permit issuance; as well as parking facilities operations and maintenance.

Objective is to promote the free flow of traffic within the City of Hoboken, utilizing shuttle bus and other alternative modes of transportation, while developing new parking facilities to maximize the number of public parking spaces available for residents, merchants, employees and visitors, in the most cost effective manner.

ILLUSTRATIVE EXAMPLES OF ESSENTIAL DUTIES

- Develops the Department budget; has full responsibility for the implementation, revision, and compliance review of the Department's budget.
- Authorizes purchases and expenditures of the Department.
- Oversees daily activities of Department personnel.
- Oversees contract personnel, and Department contracts and bid awards.
- Reviews and authorizes Department's payroll.
- Performs employee performance evaluations, and reviews evaluations performed by subordinate staff.
- Coordinates City's parking needs with other city departments and governmental agencies.
- Conducts feasibility studies to determine the need for additional parking facilities, rate changes or adjustments, and the development of new residential parking programs and monthly parking programs.
- Reviews daily collection records and prepares monthly reports of revenues and expenses for the Mayor and City Council.
- Develops Department policies and procedures.
- Reviews City Ordinances to insure that they comply with State statute, rules and regulations.
- Meetings, presentations and reports to the Mayor and City Council.
- Responds to requests from City Administrator, CFO, and Mayor.

- Attends Community meetings, and works with Community groups as the City's Parking Department representative.
- Performs related work as required.

KNOWLEDGE, SKILLS AND ABILITIES

- Extensive knowledge of the principles and practices of public and business administration; management by objectives; zero-based budget preparation, justification, monitoring and analysis; supervisory principles and practices; and employee motivation principles and techniques.
- Considerable knowledge of principles and practices of the parking industry.
- Knowledge of revenue control systems and parking technology; Municipal, County, State and Federal parking laws and regulations; collective bargaining agreements, NJ Civil Service and PERC regulations.
- Ability to interpret parking legislation as it relates to the City; read and interpret surveys, plans and construction documents; balance demand with limited resources in providing effective, efficient, and economical services to parking patrons and residents; work with the residents and constituent groups of the City to develop new programs, policies and procedures in an effort to maintain a priority level of customer service and satisfaction; prepare and present clear and concise administrative and technical reports; maintain current information on recent trends and developments in the parking industry; supervise, plan, direct, train, and coordinate the work of professional, technical, and clerical employees in the implementation of internal controls and operational policies and procedures in a manner conducive to full performance and high morale; identify problem areas, analyze and recommend solutions regarding the efficiency and effectiveness of department operations; disseminate effective advice regarding the identification of problem areas and the formulation, implementation and attainment of organizational and department goals and objectives in a manner which maximizes efficiency and effective utilization of resources; communicate clearly and concisely, both verbally and in writing to individuals and to groups; establish and maintain effective working relationships with City officials, employees, professional associations, vendors, and the general public.

MINIMUM REQUIREMENTS

***WORK EXPERIENCE*:**

- Five (5) years of senior full-time verifiable administrative/managerial experience with operational field/technical experience in a large municipal parking, public works transportation, or equivalent private sector occupation such as real estate, or commercial construction must have demonstrated financial skills.

EDUCATION:

- Graduation from an accredited college or university with a Bachelor's degree in Business/Public Administration or related field. Senior Parking System management experience may substitute for college education on a year-for year basis. Master's degree in public administration, business, management, or other job related field a plus. IPI Certified Administrator of Public Parking (CAPP) a plus.

PARKING, TRANSPORTATION & CONSTRUCTION MANAGEMENT EXPERIENCE:

- Experience in the operation and management of an on-street parking system, off-street parking facilities, on-street parking permit system, parking enforcement.
- Experience in parking garage or other large scale construction planning, development and construction.
- Experience in parking facilities or other comparable public or commercial facility management, security, and risk management.
- Experience in traffic planning and control.
- Experience in transit systems, shuttle bus or other alternative transportation integration programs.
- Experience in public/private joint ventures and community relations and involvement.

PHYSICAL REQUIREMENTS

Must have the use of sensory skills in order to effectively communicate and interact with other employees and the public through the use of the telephone and personal contact. Physical capability to effectively use and operate various items of office related equipment, such as, but not limited to, personal computer, calculator, copier, and fax machine. No significant standing, moving, climbing, carrying, bending, kneeling, crawling, reaching, handling, pushing, or pulling. Walking and sitting are required.

SUPERVISON RECEIVED

General direction is received from the City Business Administrator and CFO. Work is performed with little direct supervision and with extensive latitude for the use of judgment. Performance is evaluated for adherence to City policies and procedures, and attainment of desired goals and objectives through personal conferences and review of reports of Department operations.

SUPERVISION EXERCISED

Supervision is exercised through various levels of subordinates over a variety of technical, professional, administrative, specialized, and clerical employees with assigned responsibilities in various phases of department operations

Sample Position Descriptions

UNIVERSITY OF NORTH CAROLINA – GREENSBORO

DIRECTOR OF PARKING AND ID SERVICES

Section I: General Information

A. Purpose of Unit

The primary purpose of Parking Services is to provide effective parking and transportation for the University community and its visitors. The unit is responsible for planning, development, maintenance, and administration of all parking services, facilities, operations, transportation services, policy development, and alternative transportation services. The unit conducts planning and design of transportation services and assists the Facilities Design and Construction Office in designing transportation facilities; maintains and repairs transportation facilities and infrastructure and is a liaison with other University departments, schools and colleges and represents the University's transportation policies and interests with local and state agencies.

B. Primary Purpose of Position

The Director of Parking Services is responsible for administration of a comprehensive parking program on the UNCG campus that includes services used by the broad University community, including students, faculty, staff, public officials, and other formal and informal visitors. The principle goal is to provide convenient access to the University grounds and buildings with reasonable parking accommodations for all client groups who are authorized privileges on the UNCG campus. This position also administers the management of the One Card program with over 15,000 users. The new One Card is a comprehensive card for students, faculty, and staff incorporating a multifunctional smart chip which provides stored value, meal plans, library check-out, bookstore purchases, laundry, vending, time and attendance reporting, campus recreation center access, telephone, financial aid transfer, and parking access. The director will be responsible for establishing a cash management program for the One Card office in conjunction with the Parking office. Cash pickups will be scheduled accordingly and deposits reviewed in accordance with established University procedures.

This position develops and manages a University parking program within a framework of statutes, governing board policy, and University policy and ensures that the unique mission of the University (teaching, research, and public service) is enhanced to the fullest while managing parking and transportation resources in the most efficient and effective manner. The director is responsible for planning, design, and implementation of operational strategies for achieving maximum utilization of space available for parking and transit activities, with input from other University officials, organized committees, faculty, staff, and students. Consistent with the University's mission of teaching, research, and public service, the Director will create plans to maximize satisfaction of the user groups within the restrictions of a financially self-supporting activity. Objective short-range and long-range planning is an essential part of the position and will include consideration of all pertinent factors: including, appropriate statuses, formal and informal plans and studies, campus esthetics, financing, building usage, enrollment plans and projections handicapped considerations, new construction/renovation, curriculum (additions/changes), and maintenance and upkeep of parking lots and signs. Skillful presentations that

clarify the points of conflict and bring a successful resolution to operational and/or planning problems are required. The Director exercises broad authority in managing the Parking Program and seeks to creatively solve day-to-day operational problems to the satisfaction of users where possible while maintaining the integrity of written policy and procedures.

The Director provides direction and supervision ensuing that all studies, plans, designs, and other activities are comprehensive, cohesive and continuous in the support of transportation policies and the University and the needs of the University community. UNCG currently has a total of 28 surface parking lots and two multi-level parking decks. These facilities represent over 5100 parking spaces with an appropriate number of spaces reserved for handicapped, visitor, and special purpose parking; approximately 100 on-street parking spaces are available on campus streets and drives. Additionally, 200 spaces located adjacent to specified buildings are marked and restricted for loading, unloading or other purposes.

C. Work Schedule

The normal work schedule is 7:30 am to 4:30 pm every day. However, the schedule varies due to peak periods of traffic relative to University events, such as the beginning of each academic year, homecoming, etc. Work hours also fluctuate due to emergency situations arising from time to time such as accidents, vandalism, and mechanical breakdowns of equipment.

D. Change in Responsibilities or Organizational Relationship

From the original conception of this position, the responsibilities have increased due to the following: addition of two parking decks, expansion to a 24 hour 7 day operation, increase in number of overall spaces allocated for parking, increase in number of students, staff and faculty utilizing the program, continual changes in traffic pattern flow due to building and grounds transition, creation and expansion of ID Center for the University and One Card system, increase in number of employees within the Parking Services division, evolution of new computer billing systems and equipment to enhance traffic management; responsibility for placing charges directly on accounts for students and entering payroll deduction charges for faculty and staff. A new responsibility is the creation and implementation of a shuttle system to provide transportation from remote lots to campus. The director has been given the responsibility to manage University rental property including all aspects of property management.

Section II.

A. Description of Responsibilities and Duties

1. Parking Enforcement Administration (20%). The director is responsible for the overall management and administration of a parking enforcement program with revenue in excess of $2.8 million that insures that University parking practices are in accordance with the statutes of North Carolina and University policy. Supervises Officers involved in enforcing all parking rules and regulations fairly and consistently. Oversees ticketing off illegally parked vehicles and authorizes the towing of vehicles for impoundment when appropriate; suspends parking privileges; schedules parking enforcement services during the normal business hours of the University and during special events. On an annual basis approximately 20,000 citations are issued, and 3,000 appeals are filed.

    a) Supervises the maintenance of a reliable computerized system for the equitable enforcement of all parking regulations on the University campus. A minimum system will include provisions for collecting and summarizing daily ticket activity, accumulating totals-to-date, accumulating violations by vehicle, and providing relevant data to other University offices as required.

    b) Develops and administers hearing appeals policy and procedure. In accordance with approved policy, Parking Services will process written appeals and make decisions on those where authority has been granted; other appeals will be referred to the Standing Committee on Traffic Appeals.

    c) Reviews parking violation standards and the appropriate penalty (fine) to be applied. Surveys other North Carolina colleges and universities and selected institutions nation-wide to determine consistency of violation standards and penalties enacted.

    d) Develops, maintains and updates annually; a parking rules and regulation handbook which includes all pertinent facts regarding the use of parking facilities on the UNCG campus. The handbook outlines the normal use of parking spaces, cost of permits, hours when parking restrictions apply, special event parking privileges, penalties, and the rights and responsibilities of the user, the process for appealing a traffic citation. A presentation is made to the Vice Chancellor for Business Affairs who submits the document for Board of Trustees' approval each year.

    e) Prepares and distributes to all students, faculty, and staff each year a handout which outlines University parking rules and regulations with a map that indicates campus parking locations and any changes.

    f) Contracts with local towing operators for removal of illegally parking vehicles in violation of parking regulations.

    g) Purchases appropriate vehicles and equipment used in parking enforcement and is responsible for the maintenance and service of such vehicles; amortizes vehicles and provides for new or replacement vehicles in annual budget plans.

h) Manages the parking resources to insure parking decals of each category required and purchases the decals with enough lead-time to ensure their availability at the beginning of the new period. Approximately 9800 permits are issued annually including temporary and special permits.

2. Facility Construction, Repair, and Maintenance (15%). Plans, schedules and coordinates construction, maintenance, and repair of al parking facilities and rental properties on the University campus. Develops long-range plans to accommodate growth and changes, and insures maximum use of available space. Monitors condition of existing parking and transportation facilities and University rental properties and initiates maintenance and repair to enhance the usability of all these resources. Determines maintenance schedules and budget resources to accomplish routine maintenance; maintains traffic signs and markers.

   a) Advises Facilities Planning, Engineering and Construction Management, and Physical Plant on parking matters. Coordinates repairs and expansion plans with Facilities Planning, Engineering & Construction, and Physical Plant. Consults with architects, planners and designers to represent Parking Services in developing parking facilities that are functional, cost effective, and compatible with the campus master plan.

   b) Prepares budget and financial plans, which support the cost effectiveness and realistic financing of a new facility from a self-supporting perspective. Develops plans, which include projected use, life expectancy, long-range cash flow, and maintenance and repair requirements.

   c) Develops alternative parking opportunities for spaces lost due to construction or other interruptions on a short term or long term basis; informs the University Community of any changes in available parking (location, dates, time) and recommends reasonable alternative parking to ensure minimal inconvenience to users.

   d) Establishes a maintenance and repair program for all existing parking areas including entryway, walkways, and landscaping within the parking area. Maintenance and repair activities for near term (under 5 years) and long range are included. In developing a maintenance program, consideration will be given to age of the facility, type of surface, level of user activity, any changes to the campus master plan that would affect building or area usage, planned construction and building alteration.

   e) Develops a management system for placement of appropriate signs and markers for all parking spaces on the University campus. Monitors the condition of these devices and makes repairs or replacement on a timely basis. Maintains surface directional signing by repainting on an established schedule.
   f) Develops parking and pedestrian systems to accommodate handicapped users in compliance with federal and state statutes and University policy; reviews regulations studies, and reports relating to serving the handicapped campus community where feasible and in the best interest of the total parking program of the University.

   g) Identifies safety and security risks in all parking facilities and rental properties and seeks remedies through redesign, additional signage or markings, telephone communications,

additional patrolling, or other appropriate actions. This is done with the cooperation the University Police and divisions such as Physical Plant.

h) Develops and coordinates with the Physical Plant an emergency snow removal plan for all parking facilities, loading zones, and parking lots; determines priority of clearance in snow removal and requests appropriate personnel and equipment be assigned to carry out plan. Responds to decisions made by the Chancellor in meeting class schedules during snow emergencies and insure that University access streets and parking facilities are open and available for use.

3. University and Community Relations (15%). Represents the University's position on all parking and transit matters to a wide public arena. Articulates a positive and defensible approach in all planning and operational parking issues that are of concern to users, state and local officials, or others who have an interest in the parking and transportation activities of the University. Represents the University's position in formal presentations (oral or written) and other less formal communications with interested parties on an as needed basis.

   a) Acts as spokesman for the University in parking and transportation issues and concerns not requiring a response from a higher executive; appears before interested groups to discuss University parking and traffic policy and to clarify points of contention or misunderstanding.

   b) Reflects a sincere awareness of the sensitive nature of parking and traffic activities on the University campus and understands the need to be responsive and considerate to user demands, concerns, and valid complaints within the constraints of written University policy and established practices. The Director works closely with the local community in developing a shuttle service to provide transportation to students, faculty, and staff parked in remote parking lots.

   c) Serves as a non-voting member on appropriate University committees providing input and "expert" advice on technical aspects of parking control and administration.

   d) Represents the University in all routine parking issues with City of Greensboro Officials and with appropriate state offices; coordinates use of Greensboro Coliseum parking for large events; counsels and supports executive management in all matters that require the intervention and leadership of higher university authority.

   e) Communicates and articulates the University's position on parking issues and operations with the print and electronic media only with the knowledge and approval of higher executive management of the University.

4. Financial Management and Operations (15%). The Director administers and assists in financial planning, management, and budget administration of the department; develops realistic financial plans to meet the needs of a comprehensive parking program through study and analysis of needs and resources. Planning includes consideration of funding constraints and actions of legislative bodies and executive management of the University. The Director is responsible for constant review of existing financial plans and operations to insure effective management of facilities; conducts

special financial reviews and studies for purposes of forecasting long-term viability of new projects are expected of the Director.

a) Prepares annual operating budget requests; projects realistic revenues based on historical data and future year expectations, and programs sufficient staff and other operating expenses necessary to support the effort to achieve stated goals and objective; prepares multi-year budget forecasts for planning purposes. Insures that budgets reflect funds for repair and replacement of existing facilities, and monies for future parking expansions in harmony with long range campus planning. The current annual operating budget for the department is nearly $2.8 million.

b) Reviews existing fees and fines and proposes changes where increase or decreases are warranted and can be supported analytically; reviews monthly budget and financial reports and compares status with planned annual financial objectives; makes changes in operation where necessary to achieve results desired; communicates with the Office of Accounting and Budgets when appropriate.

c) Develops and maintains in cooperation with the Office of Accounting and Budgets and the Office of the Internal Auditor, a cash receipts and control procedure that ensure proper handling and processing of University monies. Ensures that daily receipts are balanced, proper records maintained, and funds deposited with the Cashiers Office in compliance with University procedure.

d) Develops and manages (in cooperation with University Payroll Office) a system for payroll deduction of the annual parking permit fee for faculty and staff.

5. Personnel Management & Supervision (15%). Supervises overall management of staff efforts in administering University policy and procedures in all phases of parking. Establishes departmental personnel standards and practices compatible with sound business and personnel administration. Provides opportunity for all staff to have creative input and exercise maximum self-direction in their job efforts. Maintains departmental personnel records for review and reference in all aspects of personnel administration, including hearing grievances, performance reviews, disciplinary actions, and promotions and upgrades. The Director encourages growth and development of staff through proper training and supervision; develops programmatic and operational goals each year on an individual basis with each employee. Promotes an atmosphere of customer-oriented staff.

a) Hires, trains, and evaluates personnel responsible for records management, cashiering, maintenance and transportation management, parking decal assignment, temporary permits and parking enforcement; develops and maintains job descriptions for all positions; counsels and advises employees on all work related operational matters.

b) Develops daily operational routine for in-office staff, outside enforcement staff, and shuttle bus staff; establishes hours of operation to conform to University needs and requirements and ensures adequate staff is assigned to accomplish stated objectives.

c) Promotes a positive work atmosphere that encourages maximum staff effort in achieving departmental goals while adhering to University and departmental policies and procedures.

d) Hears and discusses grievances with employees in an effort to resolve problems in accordance with established University policies and procedures and provides staff an opportunity to air complaints and have input into creative problem solving within the department.

e) Conducts training sessions to orient and inform staff on new and/or revised operating practices and procedures; assures that all staff is well informed and competent in their area of responsibility; cross trains employees in other office positions.

f) Develops internal standards to evaluate staff performance in compliance with University personnel policies and procedures. Recommends annual salary increases and proposes promotions and upgrades as warranted by departmental needs and individual personal performance. Maintains departmental time and attendance records, and assures timely reporting to appropriate University offices. Encourages staff to attend on-campus training programs to enhance work skills and abilities especially in the areas of computer usage, managing conflict, and improving interpersonal communications.

g) Stays abreast of latest innovations in parking and transportation systems through publications, seminars, workshops, and interaction with peers in higher education transportation management. Determines uniform (dress) standards for parking enforcement officers and ensures that dress and grooming standards are adhered to.

h) Reviews the academic calendar and schedules personnel for the "peak" demand hours relating to registration and the beginning of classes; cooperates with Academic Affairs and/or Student Affairs in meeting special short-term needs.

6. Special Events (10%). Works as liaison for the University with community and off campus events for special programs and projects.

a) Develops planning for special event parking; responds to requests for special parking arrangements for academic programs, athletic events, public service programs, and other University sanctioned activities. Controls the issuance of special event parking permits to insure that all permits are accounted for and are returned or voided after conclusion of the event.

b) Reviews all special event-parking requests with requesting department to determine adequacy of University facilities and the availability of space at the time requested. Determines any special needs of the potential University guests that might be considered in assignment of space; i.e., handicapped persons, children, and the elderly.

c) Coordinates all special event parking with University Police and other appropriate University departments on an "as needed" basis in order to insure that planned parking needs of patrons are met as satisfactorily as possible.

d) Purchases and maintains an inventory of appropriate signs, temporary markers and other items required to designate and control special event parking; assures that all temporary markers are removed promptly at the conclusion of the event(s) to avoid confusion to normal operations.

7. Planning and Reporting (10%). Develops plans, strategy, and direction for Parking Services; prepares reports that encompass current activities and long-range plans in University parking and transportation programs. This component of the position requires observance and detailed study of current operations with analysis of deficiencies and indications for future requirements. Stays abreast of "state of the art" parking and transportation systems at other institutions in assessing the status of services on this campus. Presents realistic goals and objectives, with workable operational plans to implement recommendations included in presentations to higher executive management.

    a) Develops a long-range plan for the University that encompasses all facets of transportation concerns including surface parking, pedestrian movement, campus transit systems, parking garage or decks, signage, and routing or re-routing of streets.

    b) Prepares an annual reporting of parking activities for inclusion in the Chancellor's Annual Report. The report includes accomplishments of the current year and objectives that are identified for the coming year.

    c) Develops and manages a system for recording the frequency of usage of parking spaces in all lots and on-street parking on an hourly/daily basis to determine adequacy of parking opportunities for users; develops and manages a system for daily accumulation of all transportation related activity; prepares monthly and daily reports for comparison with previous activity and for use in projections of future activity.

Section III.

B. Other Position Characteristics

1. Accuracy required in work: The degree of Public Relations and resources management requires a very high degree of accuracy.

2. Consequence of error: Mistakes have sweeping consequences due to the high profile and visibility of the University. Careful discretion must be given to all aspects of parking and traffic decisions and how such decisions may impact the University and local community.

3. Instructions provided to employee: Minimal.

4. Guides, regulations, policies and references used by employee: UNCG Policy Manual for Employees, Handbook for Faculty, UNCG Safety and Health Policy Manual, Traffic Records Fiscal Procedures Manual, ADA Parking Compliance Manual, and UNCG Parking and Traffic Handbook.

5. Supervision received by employee: Minimal.

6. Variety and purpose of personal contacts: This position requires a large variety of interactions including contacts with peers in the field of transportation management, city, county and state officials, faculty, staff, students, parents, and visitors to the campus. Positive interactions with these contacts are imperative to the successful operation of the unit. Communications effectively both horizontally and vertically.

7. Physical effort: Position requires little physical effort except in unusual circumstances but will be stressful at times because of the public exposure. Situations often necessitate the need to make quick, accurate decisions, and demands of a sometimes hostile client of client group.

8. Work environment and conditions: The Parking Services Office is included in a portion of the new Parking Deck which is centrally located and appropriate for the needs of the Director with appropriate space and lighting. Site visits are expected to inspect maintenance needs and construction. Both intrastate and interstate traveling at times to learn about University programs and to receive additional training.

9. Machines, instruments, tools, equipment and materials used: Indicate percent of time used.

Telephone	35%
Personal Computer	35%
Calculator	20%
Two-way Radio	10%

10. Visual attention, mental concentration and manipulative skills: Varied.

11. Safety for others: A major responsibility of the position is to manage a parking program serving a large public community that emphasizes safety and security for users of the facilities. This position is critical in the initial stages of project development to include safety components when dealing with roadway designs, parking lot designs, signaling, lighting, and landscaping. Efficient and effective means of entry into and safe movement within parking facilities with proper signs and markers is an important responsibility of this position. Routine maintenance is scheduled including trash pickup and pruning for visibility.

12. Dynamics of work: The position requires constant reading and study of new transportation management techniques, innovations, equipment; as well as staying abreast of crime and traffic problems relative to the campus. The position is also responsible for preparing reports, studies, and reviews, and analyzes daily and weekly departmental activity. Examination of documents must verify financial records and insure accuracy in safekeeping and depositing funds. Stays cognizant of planning, scheduling, and implementation of special events as well as routine activities in order to properly staff the unit; develops a spirit of teamwork among employees and hires temporary staff as needed.

Section IV.

A. Knowledge, Skills & Abilities, and Education & Requirements

1. Displays an ability to learn rapidly and adapt quickly to changing situations and has a working knowledge of modern office procedures, practices, and equipment. Exhibits substantial experience in parking and transportation administration and management at a college or university with first-line responsibility planning and daily operations of parking facilities is essential for this position. Possess knowledge of the principles and practices of public and business administration. Displays knowledge of personnel guidelines, purchasing and accounting practices and has a thorough knowledge of appropriate statutes governing parking facility planning, administration, and operations. Develops sound action plans for concepts and practices related to University parking and transit operations; displays skill in analyzing studies, reports, and evaluation summaries; responds effectively when presenting oral and written reports to higher authorities with convincing clarity and understanding.

2. Develops positive expectations for Parking Services and maintains effective working relationships with associates, and other state officials and the general public. Responds quickly to feedback and has the ability to articulate the position of the University on parking issues and concerns and establish a professional rapport with various individuals, offices, and agencies that will interact with the Parking Services Office in meeting the goals and objectives of serving the University community.

3. Sets high standards of personal performance of employees and has the ability to select, train, and supervise employees engaged in business operations. Demonstrate the ability to effectively direct the work of others; to plan, coordinate, and monitor daily work activities and achieve the desired goals that have been established. Must have the ability to organize and communicate priorities to the staff and provide opportunities for the staff to creatively solve operational problems.

4. Adheres to sound auditing principles and is able to plan and direct fiscal and business services. Utilizes a variety of analytical techniques to solve problems and plan budgets, financial reports, and manage the financial resources of the Parking Services Office.

B. Minimum Level of Formal Training

1. Graduation from a four-year college or university preferably with a major in business or public administration and five years administrative experience involving participation in the planning and management of a business or governmental program; or an equivalent combination of training and experience.

2. Formal education will not fully prepare an individual for entry into this position. Extensive administrative responsibilities on a college or university campus specifically associated with parking or police work is a necessary requirement.

3. No type of training and/or experience can be substituted for the formal education. It is essential in providing proper public administration and customer relationships and public interactions.

4. A license or certification is not applicable for the duties of this position.

Sample Position Descriptions

CITY OF SAN JOSÉ, CALIFORNIA

City of San José

PARKING MANAGER (1691)

CLASS PURPOSE

Under general direction, performs work of considerable difficulty managing a division of the Department of Traffic Operations involved in the planning, programming, design, operations, financing and maintenance of the City's parking system, including its relationship with Downtown development. Performs related work as required.

TYPICAL DUTIES AND RESULTS: (Any one position may not include all the duties listed, nor do the examples cover all the duties which may be performed.)

- Supervises and performs difficult administrative work in the preparation and implementation of a division's program and capital improvement budget; the preparation of revenue reports and monthly profit and loss statements; personnel management and training; and organizational planning.
- Plans, assigns, and directs a staff of professional, technical, clerical and maintenance employees engaged in operation, maintenance, and enforcement activities related to the City's parking system.
- Plans and directs scheduling and assignment of personnel; ensures the safety of assigned personnel; directs the assignment of work for, and the instruction, inspection, and evaluation of personnel; handles disciplinary action when necessary; interprets new laws, regulations, and directives to personnel.
- Coordinates and performs negotiation, development, administration, monitoring and evaluation of complex parking management contracts to include; facility operations, revenue control, equipment selection and operation, customer relations, and towing/abandoned vehicles.
- Designs financial plans and strategies for development of new parking facilities.
- Plans engineering and financial studies, directs collection of field data, analyzes data and prepares reports.
- Directs transportation engineering studies related to parking facility access, and impacts of parking facilities on vehicular traffic flow.
- Directs the supervision of staff in implementing enforcement programs in on-street and off-street vehicle parking, abandoned and junk vehicles.
- Oversees the development of marketing plans designed to attract new customers and increase parking facility utilization.
- Coordinates audits of parking facility operations and recommends annual rate changes and revenues to City Council.
- Performs parking studies and analysis of specific projects and special areas. Directs the evaluation of new products, the development of specifications, and the development of bid packages for future purchases.

- Approves plans, agreements, expenditures and other matters on behalf of the Director as assigned.
- Provides staff support to the Parking Advisory Commission.
- Represents the department on City boards and commissions and may represent the City on county, state and national committees.
- Maintains liaison with citizen groups, elected and appointed officials, public agencies, committees, consultants and private enterprises and the general public on the City's behalf.

Typical End Results Include: An effective city-wide parking program that maximizes parking revenues and minimizes program costs; the effective and efficient use of allocated resources; technical expertise and advice to City departments and Agencies; and the identification of capital improvement projects for funding.

DISTINGUISHING CHARACTERISTICS

This class is characterized by the overall administration of city-wide transportation and parking programs as compared to supervision and coordination of parking operations and facilities. The incumbent is responsible for managing a division concerned with the planning, development, operations, maintenance, regulation and access to city-wide parking facilities. This class differs from that of Parking Contract Coordinator in that incumbents of this latter class are responsible for managing day-to-day parking operations and facilities through negotiating and administering agreements and contracts.

QUALIFICATIONS

Minimum Knowledge, Skills and Abilities

- Knowledge of techniques involved in revitalization programs, and their relationship to parking and transportation programs.
- Knowledge of management and engineering principles and practices as they relate to parking systems.
- Knowledge of principles and practices of traffic and transportation engineering. Knowledge of principles and practices of management, personnel administration and training and contract administration.
- Skills in effective public relations.
- Ability to perform technical research requiring engineering data and reports. Ability to deal effectively and tactfully with other professionals, elected officials, contractors, consultants, and the general public.
- Ability to effectively supervise professional, technical, maintenance and clerical staff.
- Ability to communicate clearly and concisely, both orally and in writing.
- Ability to collect, compile, analyze and interpret data.
- Ability to conduct parking needs analysis and design parking management plans.

Competency Knowledge, Skills and Abilities

- Knowledge of laws, regulations and ordinances involved in the operation of parking facilities, contracts or concessions.
- Knowledge of business finance, accounting, and Urban Development programs. Knowledge of the practices of attaining state and federal grants.
- Knowledge of contract administration and preparation.
- Knowledge of elements of parking systems design and operations.

Training and Experience

Successful completion of a Bachelor's Degree from an accredited college or university in Public Administration, Business Administration, Engineering or related field and six (6) years of increasingly responsible professional analytical staff experience, including at least two (2) years of professional experience working in a public parking or municipal traffic/transportation program. Education may not be substituted for the required parking or traffic/transportation experience.

(Formerly Parking Manager)

(Formerly Administrator)
P01-1691.SPC

Sample Position Descriptions

CITY OF WEST HOLLYWOOD, CALIFORNIA

CITY OF WEST HOLLYWOOD, CALIFORNIA
CLASS SPECIFICATION

CLASS TITLE: PARKING OPERATIONS DIVISION MANAGER CLASS CODE: 22823
DEPARTMENT: TRANSPORTATION AND PUBLIC WORKS FLSA STATUS: E
REPORTS to TRANSPORTATION AND PUBLIC WORKS DIRECTOR DATE:

JOB SUMMARY:

- Assists the department director in managing all staff and department functions, including long and short range planning, budget development and staff management of an assigned division. Oversees, coordinates and manages various functions associated with parking services.

ESSENTIAL JOB FUNCTIONS: (All responsibilities may not be performed by all incumbents.)

- Carries out managerial responsibility in accordance with policies, procedures and applicable laws, including: interviewing, hiring and training staff; planning, assigning and directing work; establishing deadlines; appraising performance; rewarding and disciplining employees; coordinating, developing and approving staff training; and addressing complaints and resolving problems.
- Plans, coordinates, assigns, and monitors performance and coaches, counsels, mentors, trains, and advises employees in department for the dual goals of meeting department goals and employee career development; assists staff in the completion of assigned tasks.
- Researches, develops, interprets, communicates, and monitors policies, procedures, codes, standards, etc.; recommends improvement when necessary and writes/revises same.
- Manages the planning, acquisition and development of parking projects/facilities; coordinates functions with other City departments, public agencies, constituents, etc.
- Prepares work programs; identifies projects, funding needs and time frames.
- Determines methodologies, data, information resources and techniques to be utilized in researching and developing programs and policies.
- Directs the preparation of studies and reports related to division operations by developing proposals and recommendations and providing technical assistance.
- Plans long-range goals, objectives, management systems, organizational structure, and overall direction for the division; plans and implements short-term or annual goals, objectives, strategies, projects or programs to ensure efficient organization and completion of work.
- Coordinates division activities with other departments, divisions and/or outside agencies; responds to citizen inquiries.
- Serves as technical resource on division operations.
- Prepares and/or reviews complex reports and analysis utilizing a variety of software; receives, sorts, and summarizes material for the preparation of reports; relays and interprets administrative decisions, policies and instructions.

- Represents the City and/or serves as a liaison and/or member of various committees/teams and collaborates, persuades, presents reports to and negotiates with others outside own work area to coordinate efforts and maintain cooperative and efficient relations.
- Prepares reports and make presentations to various boards and commissions.
- Ensures quality standards and compliance with regulations are maintained.

IMPORTANT JOB FUNCTIONS:

- Develops and administers the division budget; monitors expenditures.
- Maintains and upgrades professional knowledge, skills, and development by attending seminars and training programs and reading trade and professional journals and publications.
- Interacts with a variety of high level individuals, both internally and within the community to provide information, disseminate departmental information and assist in resolving administrative issues.
- Follows up on inquiries from various agencies, groups, media, etc., regarding department programs and services.
- Disseminates a variety of information to various agencies, divisions, or departments via telephone, mail or FAX.
- Performs other related duties as assigned.

MATERIAL AND EQUIPMENT USED:

MINIMUM QUALIFICATIONS REQUIRED:

Education and Experience:

- Bachelor's degree from an accredited four-year college or university in a related field; and,
- Five to seven years of progressively responsible related experience; or,
- Any combination of education, training and experience which provides the required knowledge, skills, and abilities to perform the essential functions of the job.

Licenses and Certifications:

- CAPP Certification Preferred

KNOWLEDGE, SKILLS, AND ABILITIES:

Knowledge of:

- Applicable state, federal and local ordinances, codes, laws, rules and regulations and legislative issues.
- Administrative principles and practices, including goal setting and implementation.
- Administration of staff and activities, either directly or through subordinate supervision.
- Principles and practices of parking management.
- Principles and practices of public administration.
- Fiscal and budget processes, policies and procedures.
- Municipal contract management.

- Project management techniques.
- Human resources management.
- Correct English usage, including spelling, grammar, punctuation, and vocabulary.
- Internal departmental policies and procedures.
- City government organization and operations.
- External governmental bodies and agencies related to area of assignment.

Skill in:

- Planning, organizing, assigning, directing, reviewing and evaluating the work of staff.
- Selecting and motivating staff and providing for their training and professional development.
- Negotiating and resolving complex issues.
- Reviewing and assessing needs and analyzing data.
- Interpreting laws and legislation.
- Public speaking techniques.
- Using tact, discretion, initiative and independent judgment within established guidelines.
- Analyzing and resolving policy issues, office administrative situations and problems.
- Researching, compiling, and summarizing a variety of informational and statistical data and materials.
- Organizing work, setting priorities, meeting critical deadlines, and following up on assignments with a minimum of direction.
- Applying logical thinking to solve problems or accomplish tasks; to understand, interpret and communicate complicated policies, procedures and protocols.
- Communicating orally with internal staff, citizens, and other departmental staff in order to give and receive information in a courteous manner.
- Operating and maintenance of computer hardware/software.
- Operating and routine maintenance of general office machines such as copiers, facsimile machines, telephone systems, and paging systems.

Mental and Physical Abilities:

- Ability to read and interpret documents such as operation and maintenance instructions, procedure manuals, and so forth.
- Ability to delegate authority to staff.
- Ability to facilitate goal setting.
- Ability to establish and maintain effective working relationships with others.
- Ability to add, subtract, multiply and divide whole numbers, common fractions and decimals.
- Ability to analyze and resolve problems involving several variables.
- While performing the essential functions of this job, the incumbent is regularly required to sit; use hands to finger, handle, or feel objects; reach with hands and arms; speak and hear; and occasionally push, pull and/or lift up to 10 pounds.

Working Conditions:

- Work is performed in a normal office environment with little exposure to outdoor temperatures or dirt and dust.

- The incumbent's working conditions are typically moderately quiet, but may be very loud at some locations or during the completion of some functions.

This class specification should not be interpreted as all inclusive. It is intended to identify the essential functions and requirements of this job. Incumbents may be requested to perform job-related responsibilities and tasks other than those stated in this specification. Any essential function or requirement of this class will be evaluated as necessary should an incumbent/applicant be unable to perform the function or requirement due to a disability as defined by the Americans with Disabilities Act (ADA). Reasonable accommodation for the specific disability will be made for the incumbent/applicant when possible.

Sample Position Descriptions

THE WILMINGTON PARKING AUTHORITY

THE WILMINGTON PARKING AUTHORITY
EXECUTIVE DIRECTOR – JOB DESCRIPTION

The Executive Director is the chief executive officer of The Wilmington Parking Authority reporting directly to the Board of Directors. The position entails total responsibility for all major disciplines of the Authority, including the development of parking garages and lots as well as the maintenance of programs, procedures, and systems.

I. General and Administrative Responsibilities

- Recommend goals of the Authority to the Board.
- Operate the Authority in accordance with all governing legislation and bond indenture restrictions.
- Negotiate labor, construction, and major repair and maintenance agreements
- Develop, issue, and supervise public bids
- Develop and administer Authority policies and procedures
- Prepare job function and descriptions
- Indirect supervision of hiring and firing
- Promote effective employee relations and training
- Direct supervision of the Director of Finance, the Director of Facilities Management, and the Director of Operations
- Indirect supervision of all office staff, superintendents, lot cashiers and maintenance staff and uniformed security contract staff
- Indirect supervision of all investments
- Supervision of bonding process
- Indirect supervision of preparations of budgets and forecasts
- Monitor the supply and demand of parking in the Central Business District (CBD)
- Recommend rate changes to the Board
- Attendance at all Board meetings
- Preparation of Board meeting agendas and reports
- Work with Board Committees
- Maintain effective relationships with Joint Venture partners and managed facility owners
- Represent the Authority to the press

II Off-Street Parking Responsibilities

- Management of Total program
- Feasibility assessment, planning, design, financing, and construction of facilities
- Indirect supervision of the assignment of personnel
- Indirect supervision of training of cashiers and maintenance staff
- Indirect supervision of facility maintenance and minor repair, construction, and maintenance agreements
- Indirect supervision of facility revenue collection and control
- Negotiation of security guard contracts

- Indirect supervision of uniformed security guards
- Promote a high level of quality assurance and customer satisfaction

III Management – Commercial Real Estate

- Negotiate retail leases
- Indirect supervision of retail space management

IV Government and Community Relations

- Foster good neighborhood contacts and consistent neighborhood relations
- Maintain effective relationships with elected officials, departments, and employees of the City of Wilmington, the State of Delaware, and New Castle County
- Maintain effective relationships with corporate customers, individual customers, other CBD
- Parking operators, merchants, corporations, WILMAPCO, the Riverfront Development
- Corporation, the Wilmington Renaissance Corporation, Visions, Amtrak, and SEPTA

CITY OF LONG BEACH, CA

Public/Government Affairs Manager

ALLIANCE
RESOURCE CONSULTING LLC

THE POWER OF PARTNERSHIP

CITY OF LONG BEACH, CA

Public/Government Af

The City

Located on the coast of the Pacific Ocean between Los Angeles and Orange County, the City of Long Beach (population 487,000) is frequently described as a series of strong, diverse, interwoven smaller neighborhoods within a large city. *USA Today* has called Long Beach, the fifth largest city in California, the "most diverse city" out of the 65 most populous cities in the nation. Long Beach is proud of the depth of its integrated ethnic diversity. The City is home to residents of African American, Asian, Caucasian, Native American/Alaskan, Hispanic and Native Hawaiian/Pacific Island descents, as well as the largest Cambodian population outside of Cambodia.

Enjoying an ideal Southern California climate, Long Beach is home to an abundance of cultural and recreational opportunities. The Long Beach Convention Center, the International City Theatre, Aquarium of the Pacific, Queen Mary, the West Coast Hockey League's Ice Dogs, the annual Toyota Grand Prix of Long Beach plus a wide variety of other attractions serve to draw over four million visitors a year. The City is also home to California State University, Long Beach and Long Beach City College.

While Long Beach offers all the amenities of a major metropolis, the City has the added benefit of having maintained a strong sense of community and cohesiveness despite its growth. A superb climate, quality schools, a vibrant and revitalized downtown and wide variety of neighborhoods help make Long Beach one of the most livable communities in the country.

The Port of Long Beach, combined with the adjacent Port of Los Angeles, is the busiest on the West Coast; the volume of cargo tonnage handled make the combined port the nation's largest container facility and the second busiest in the world. The City also has its own full-service commercial airport which has become a favored travel-friendly alternative to other Southern California airports by offering preferred flight schedules, carriers, and overall accessibility. In addition, Los Angeles' rail transit system, the Metro Blue Line, has numerous stops within the City and throughout the region.

Covering approximately 50 square miles, Long Beach is supported by a wide mix of industries with education, health and social services, manufacturing, retail trade, and professional services comprising the highest representation. Known for its livable and desirable neighborhoods, the City consists of more than 163,000 households. Thirty-two percent of the population is under the age of 20. The median family income is slightly over $40,000, however, nearly 25 percent of families earn more than $75,000 per year.

The City Government

The City of Long Beach is a full-service Charter City governed by nine City Councilmembers who are elected by district. The Mayor is elected at-large. Elected officials are subject to two four-year terms. Mayor Beverly O'Neill is Long Beach's first three-term citywide elected mayor. In November 2002, she was re-elected to an unprecedented third term as a write-in candidate. Just recently, Mayor O'Neill was named the "2004 Municipal Leader of the Year" by American City & County magazine. She also currently serves as the Vice President of the U.S. Conference of Mayors, and in June will assume the Presidency of the U.S. Conference of Mayors.

Elected officials also include the City Attorney, City Auditor, and City Prosecutor. The municipality is supported by a total budget of approximately $1.8 billion, and FY 04-05 General Fund budget of $373 million. Approximately 6,000 employees comprise the City's workforce with most represented by nine bargaining units.

In addition to all traditional municipal services, the City operates and maintains a world-class international deep-water harbor, a nationally recognized convention center, beaches and marinas. Long Beach is one of only three cities in California with its own Health Department and Energy

ffairs Manager

Department and the only city in California with its own Oil Department, which manages close to 2,000 oil wells.

Not unlike other municipalities, Long Beach is facing serious fiscal challenges. In 2002, the City forecast a $102 million General Fund structural deficit. Working closely with the City Council and the community, Long Beach has developed and implemented an aggressive plan to address this issue. A Three-Year Financial Strategic Plan, adopted by the City Council in 2003, set the framework for eliminating the structural deficit. During its first year of implementation, the Plan was successful in reducing the deficit by $41 million. The remaining $61 million of the deficit will be eliminated through a carefully designed balance of cost reductions and revenue enhancements during the next two years.

The City Manager's Department

The City Manager's Department is responsible for the administration of all City departments with the exception of elected and appointed offices and commission-governed departments. The City Manager plans and directs the implementation of City programs in accordance with City Council policies, the City Charter, and the Municipal Code, and provides leadership for efficient and effective municipal services for the community.

The Position

The Public/Government Affairs Manager reports to the City Manager, and is responsible for providing and coordinating legislative and media relations for the City of Long Beach. The Public/Government Affairs Manager has oversight responsibility for the Public/Government Affairs team which includes the Public Information Officer. Specifically, the Public/Government Affairs Manager assists the City Manager, Assistant City Manager and Deputy City Managers by compiling information and providing background concerning legislation and government relations. He/She provides elected officials and management staff with timely information, analyses, technical assistance, and recommendations regarding various legislative issues, public and internal communication projects and related intergovernmental activities.

The Public/Government Affairs Manager assists with directing legislative priorities and ensures that the City's legislative strategies are carried out by contracted legislative advocates.

The position is vacant due to the previous incumbent accepting a promotional opportunity.

The Candidate

Education and Experience

- Requires a bachelor's degree from an accredited college or university with a major in political science, public administration, journalism, communications or a related field. A master's degree is desirable.
- Five to seven years of intergovernmental relations and/or legislative experience, including experience in State, Federal and regulatory issues. Candidates should also be knowledgeable about the methods of providing information to the public and the media, and should also have demonstrated experience in writing and public speaking.
- Knowledge of a complex full-service municipal organization is preferred. Candidates should also have knowledge of the City's relationship with regional organizations such as the Gateway Cities Council of Governments, Southern California Association of Governments, the League of California Cities, and the Southern California Air Quality Management District.

Management Style and Personal Traits

The ideal candidate will be intelligent, able to think on his/her feet and able to quickly prioritize and shift priorities as needed. He/She should be politically astute but apolitical, able to establish relationships and work collaboratively as part of a team. The ideal candidate should be visible, responsive, dedicated, hardworking and accessible. This person should also be able to multi-task and coordinate legislative efforts on multiple fronts.

Appendix 4

Sample Crisis Communication Plan

Appendix 4: Sample Crisis Communication Plan

When an emergency occurs, the need to communicate is immediate. If business operations are disrupted, customers will want to know how they will be impacted. Regulators may need to be notified and local government officials will want to know what is going on in their community. Employees and their families will be concerned and want information. Neighbors living near an incident may need information—especially if they, their residence or their business could be impacted. All of these "audiences" will want information before the business has a chance to begin communicating.

An important component of an organization's planning effort is the creation of a crisis communications plan. A business or organization must be able to respond promptly, accurately and confidently during an emergency in the hours and days that follow. Many different audiences must be reached with information specific to their interests and needs. The image of the business can be positively or negatively impacted by public perceptions of the handling of the incident.

This document provides direction for developing a crisis communications plan. Understanding potential **Audiences** is key, as each audience wants to know: "How does it affect me"? Guidance for scripting **Messages** that are specific to the interests of the audience is another element of the plan. The **Contact & Information Center** section explains how to use existing resources to gather and disseminate information during and following an incident.

Audiences

Understanding the audiences that a business or organizational needs to reach during an emergency is one of the first steps in the development of a Crisis Communications Plan. There are many potential audiences that will want information during and following an incident and each has its own needs for information. The challenge is to identify potential audiences, determine their need for information and then identify who within the business is best able to communicate with that audience.

The following is a list of audiences that a parking program should consider as they create a crisis communication plan:

- Patrons
- Those directly impacted by the incident, and if applicable, their families
- Parking program employees, and if applicable, their families
- News media
- Community stakeholders—especially those living near or directly impacted by an incident
- Program management, Managers and other financial stakeholders
- Government elected officials, regulators and other authorities
- Suppliers, if applicable

Contact Information

Contact information for each audience should be compiled and immediately accessible during an incident. Existing information such as customer, supplier, and employee contact information may be exportable from existing databases. Include as much information for each contact as possible (e.g., organization name, contact name, business telephone number, cell number, fax number, and email address). Lists should be updated regularly, secured to protect confidential information and available to authorized users for use by members of the crisis communications team. Electronic lists can also be hosted on a secure server for remote access with a web browser. Hard copies of lists should also be available at the alternate location.

Customers

Customers are the life of a business, so contact with customers is a top priority. A crisis communication (business continuity) plan should include action to redirect incoming telephone calls to a second location (if available) or to a voice message indicating that the organization is experiencing a temporary problem. This plan should also include procedures to ensure that customers are properly informed about issues that may impact them directly and indirectly.

Front line parking staff who are normally assigned to work with customers should be assigned to communicate with customers during a crisis as well. If there are a lot of customers, then the list should be prioritized to reach the most important customers first.

Remember, in the case of a crisis: communicate early, communicate often, and communicate as honestly as possible.

Suppliers

The crisis communication plan should include documented procedures for notification of suppliers, for example technology providers, other city departments who directly supply support or services to a parking program, contracted staff, etc. The procedures should identify when and how they should be notified.

Management

Protocols for when to notify management should be clearly understood and documented. Consider events that occur on a holiday weekend or in the middle of the night. It should be clear to staff what situations require immediate notification of management regardless of the time of day. Similar protocols and procedures should be established for the notification of managers, investors, and other important stakeholders. Management does not want to learn about a problem from the news media.

Government Officials and Regulators

Communications with government officials depends upon the nature and severity of the incident and protocol for notifying upper level City management should be discussed as part of the crisis communication planning process. Businesses/organizations that fail to notify a regulator within the prescribed time risk incurring a fine. Occupational Safety and Health Administration (OSHA) regulations require notification to OSHA when there are three or more hospitalizations from an

accident or if there is a fatality. Environmental regulations require notification if there is a chemical spill or release that exceeds threshold quantities. Other regulators may need to be notified if there is an incident involving product tampering, contamination or quality. Notification requirements should be documented in the Crisis Communications Plan. A major incident in the community will capture the attention of elected officials. A senior manager should be assigned to communicate with elected officials and public safety officials.

Employees

Human Resources (HR), or another designated management level staff person, are responsible for the day-to-day communications with employees regarding employment issues and benefits administration. HR management/designated management should assume a similar role on the crisis communications team. This designated person/people should coordinate communications with management, supervisors, employees, and families. They should also coordinate communications with those involved with the care of employees and the provision of benefits to employees and their families. Close coordination between management, designated organizational spokesperson, public agencies, and HR is needed when managing the sensitive nature of communications related to an incident involving death or serious injury.

The Community

Parking programs and their services are very customer-oriented so in addition to internal/organizational audience, the community at large can become an important audience. As such, community outreach should be part of the crisis communications plan. The plan should include coordination with public safety officials to develop protocols and procedures for advising the public of any hazards and the most appropriate protective action that should be taken if warned.

Positioning

To decide on how you position your communication to the community at large, it is important to step out of your role in the business/organization and put yourself in the situation of whom ever was involved in the crisis or try to view the crisis from the eye of the public. Ignoring the situation will only make things worse.

Examples of categories to consider for positioning are:

- Human error
- Clerical error
- Unauthorized procedures
- Inadequate supervision
- Inadequate quality control
- Misuse of confidential information
- Errors of judgment
- Inadequate standard operating procedures

As you are considering your “position” it is important to consider the wide range of consequences (e.g., legal, financial, public relations, effects on administration, and effects on operations). Keep in mind that people tend to remember what they hear first and last.

News Media

If the incident is serious, then the news media will be on scene or calling to obtain details. There may be numerous requests for information from local, regional or national media. The challenge of managing large numbers of requests for information, interviews, and public statements can be overwhelming. Prioritization of requests for information and the development of press releases and talking points can assist with the need to communicate quickly and effectively.

Develop a company policy that only authorized spokespersons are permitted to speak to the news media. Communicate the policy to all employees explaining that it is best to speak with one informed voice.

Determine in advance who will speak to the news media and prepare that spokesperson with talking points, so they can speak clearly and effectively in terms that can be easily understood.

Designated Spokesperson

One individual should be designated as the primary spokesperson to represent the City, make official statements, and answer media questions throughout the crisis. A backup to the designated spokesperson should also be identified to fill the position in the event that the primary spokesperson is unavailable.

In addition to the primary spokesperson and the backup spokesperson, individuals who will serve as technical experts or advisors should be designated. These resources might include a financial expert, an engineer, a leader in the community or anyone your organization deems necessary during a specific kind of crisis. This will take some brainstorming by the crisis communication team since what is needed may not always be apparent. There should be an authority or technical expert in their field and be available to supplement the knowledge of the spokesperson.

Criteria for the spokesperson, backup spokesperson, and crisis communication expert is:

- Comfortable in front of a TV camera and with reporters. Preferably, skilled in handling media, skilled in directing responses to another topic, skilled in identifying key points, able to speak without using jargon, respectful of the role of the reporter, knowledgeable about the organization and the crisis at hand.
- Able to establish credibility with the media, able to project confidence to the audience, suitable in regard to diction, appearance and charisma, sincere, straightforward and believable, accessible to the media and to internal communications personnel who will facilitate media interviews, able to remain calm in stressful situations.

In addition to the designated spokesperson and backup, it can be anticipated that other parties involved in the crisis; police, fire department, health officials, etc., will also have a spokesperson. It is important to obtain the identity of that individual as early as possible so all statements and contacts with the media can be coordinated between the two individuals and their organizations/interests whenever possible.

Practicing Tough Questions

A crisis situation is always difficult when dealing with the media. Therefore, tough questions and rehearsals are necessary to help the spokesperson prepare.

It is important, at the onset of the crisis, that the spokesperson, backup, and advisors spend some time rehearsing prepared statements and answers to possible "tough" questions that may be asked by reporters. If possible, similar rehearsals should be conducted prior to each media interview, briefing, or news conference. It is also important to anticipate and practice new questions as the story evolves. It is better to over prepare than to be surprised by the depth of questioning by the media.

The designated spokesperson should prepare questions and answers for the practice sessions. These questions and answers should be for internal use only and not for distribution outside the organization. Don't volunteer information unless it is a point the organization wants to make and the question hasn't been asked. Don't talk off the record.

Prepared Statements

If you don't communicate immediately, you lose your greatest opportunity to control events. Your first news release should include at a minimum the who, what, when, and where of the situation.

You must give the facts that have been gathered from reliable sources and confirmed. Don't over reach and don't speculate. If you do nothing more than show concern for the public and for your employees in your first press interaction, you are already on the right track. The corollary of expressing concern and generating good will at the consumer level is securing the loyalty of your customers and employees by taking the initiative to share information with them. If your employees and customers don't feel like insiders, they are going to act like outsiders.

You must have a prepared statement on hand that can be used to make an initial general response to the media when knowledge about the crisis first becomes known on a widespread basis or by reporters. As the crisis progresses and new information and facts become available, it is also advisable to develop prepared statements to be made by the spokesperson at the onset of any media interview, briefing, or news conference. These prepared statements also can be read over the telephone to reporters who call to request information but are not represented at news conferences or briefings. The statement can also be sent by e-mail or posted on the organization’s website or appropriate social media account.

Messaging

During and following an incident, each audience will seek information that is specific to them. “How does the incident affect my order, job, safety, community…?” These questions need to be answered when communicating with each audience.

After identifying the audiences and the spokesperson assigned to communicate with each audience, the next step is to script messages. Writing messages during an incident can be challenging due to the pressure caused by “too much to do” and “too little time.” Therefore, it is best to script message templates in advance if possible.

Pre-scripted messages should be prepared using information developed during the risk assessment. The risk assessment process should identify scenarios that would require communications with stakeholders. There may be many different scenarios but the need for communications will relate more to the impacts or potential impacts of an incident:

- Accidents that injure employees or others

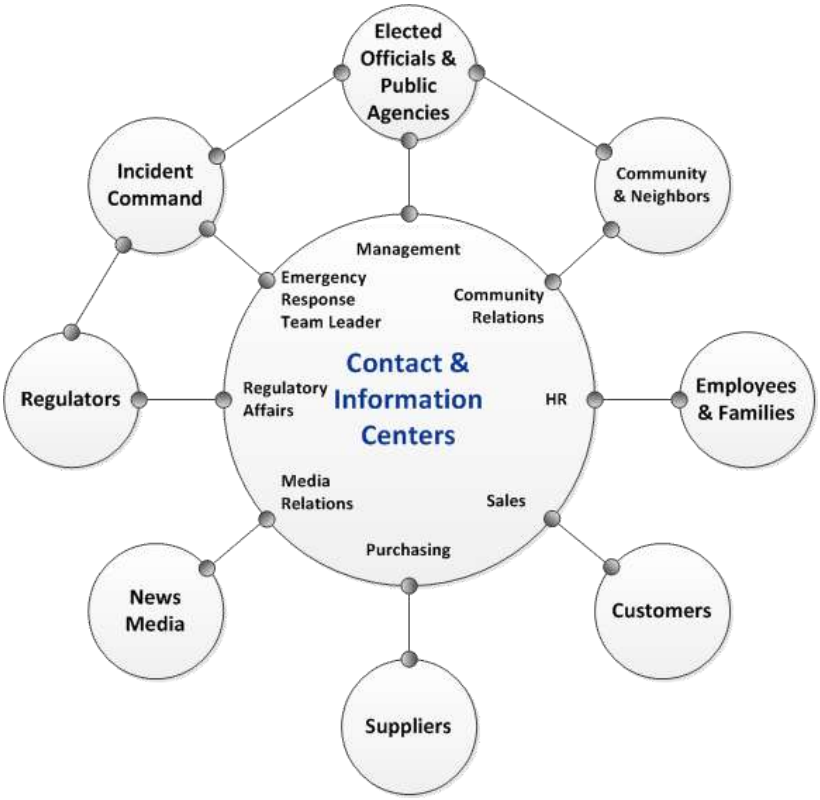
- Property damage to company facilities
- Liability associated injury to or damage sustained by others
- production or service interruptions
- product quality issues

Messages can be pre-scripted as templates with blanks to be filled in when needed. Pre-scripted messages can be developed, approved by the management team and stored on a remotely accessible server for quick editing and release when needed.

Another important element of the Crisis Communications Plan is the need to coordinate the release of information. When there is an emergency or a major impact on the business, there may be limited information about the incident or its potential impacts. The “story” may change many times as new information becomes available.

One of the aims of the Crisis Communications Plan is to ensure consistency of message. If you tell one audience one story and another audience a different story, it will raise questions of competency and credibility. Protocols need to be established to ensure that the core of each message is consistent while addressing the specific questions from each audience.

Another important goal of the Crisis Communications Plan is to move from reacting to the incident, to managing a strategy, to overcoming the incident. Management needs to develop the strategy and the crisis communications team needs to implement that strategy by allaying the concerns of each audience and positioning the organization to emerge from the incident with its reputation intact.



Communications before, during, and following an emergency are bi-directional. Stakeholders or audiences will ask questions and request information. The City will answer questions and provide information. This flow of information should be managed through a communications hub.

Contact and Information Centers form the “hub” of the Crisis Communications Plan. The centers receive requests for information from each audience and disseminate information to each audience. Employees from multiple departments may be assigned

to communicate with a specific audience.

The “contact center” fields inquiries from customers, suppliers, the news media and others. The contact center should be properly equipped and staffed by personnel to answer requests for information. The staff working within the contact center should be provided with scripts and a “frequently asked questions” (FAQ) document to answer questions consistently and accurately.

The “information center” consists of existing staff and technologies (e.g., Website, call center, bulletin boards, etc.) that field requests for information from customers, employees and others during normal business hours. The information center and its technologies can be used to push information out to audiences and post information for online reading.

The crisis communications team, consisting of members of the management team, should operate in an office environment to support the contact and information centers. The goal of the crisis communications team is to gather information about the incident. This should include monitoring the types of questions posed to call center operators or staff in the office; emails received by customer service; social media chatter, and stories broadcast by the news media. Using this input, the crisis communications team can inform management about the issues that are being raised by stakeholders. In turn, management should provide input into the messages generated by the crisis communications team. The team can then create appropriate messages and disseminate information approved for release.

Resources for Crisis Communications

Resources should be available within the primary business site and provisions should be made to set up similar capabilities within an alternate site in case the primary site cannot be occupied.

- Telephones with dedicated or addressable lines for incoming calls and separate lines for outgoing calls
- Access to any electronic notification system used to inform employees
- Electronic mail (with access to “info@” inbox and ability to send messages)
- Access to company Web site to post updates
- Access to social media accounts
- Access to local area network, secure remote server, message template library, and printers
- Hard copies of emergency response, business continuity, and the Crisis Communications Plan
- Site and building diagrams, information related to business processes and loss prevention programs (e.g., safety and health, property loss prevention, physical and information/cyber security, fleet safety, environmental management, and product quality)
- Copiers
- Forms for documenting events as they unfold

The sources for this outline were *Crisis Communication Plan* (www.ready.gov) and *Crisis Communication Plan: A PR Blueprint* (www.newsplace.org/crisis). Additional resources for Crisis Communication Strategies:

- 10 Steps of Crisis Communication, Jonathan Bernstein (2013)
- Crisis Communications: A Primer for Teams, Al Czarnecki (2007)
- You'd Better Have a Hose if You Want to Put Out the Fire: The Complete Guide to Crisis and Risk Communications, Rene A. Henry (2001)

Appendix 5

Recommended Reading List for Parking Professionals

2018 RECOMMENDED READING LIST FOR PARKING PROFESSIONALS

Each year Kimley-Horn updates its recommended reading list for parking professionals. This year'supdate includes several new additions in the areas of sustainability and urban planning.

Be sure to check out the new additions to the RECOMMENDED WEB-PAGES!

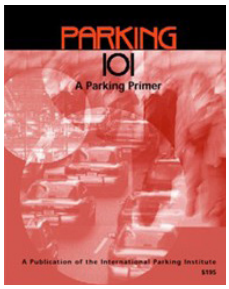
Kimley»Horn

Expect More. Experience Better.

2018 Reading List

The following is a basic bibliography of good parking planning, general management and marketing texts that can enhance your management capabilities and your specific knowledge of important parking and transportation topics:

PARKING PLANNING



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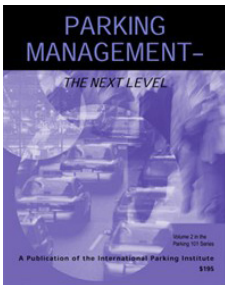

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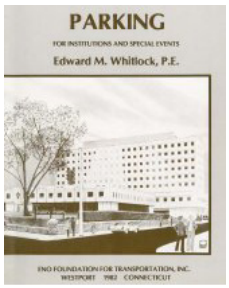

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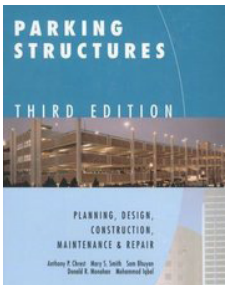

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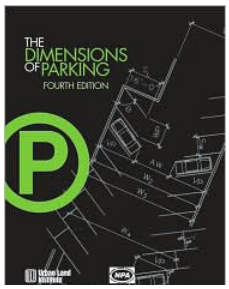

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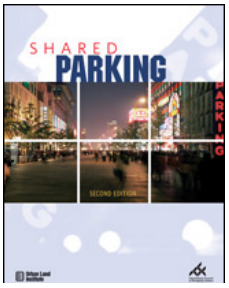

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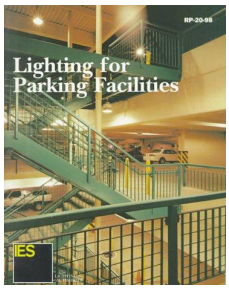

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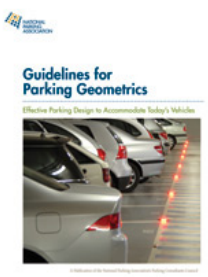

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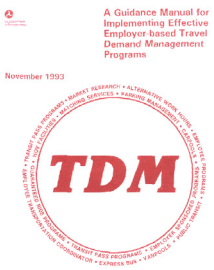

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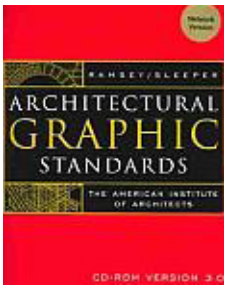

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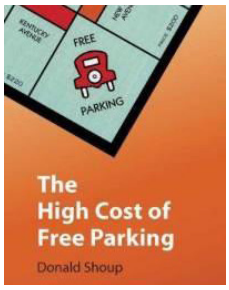

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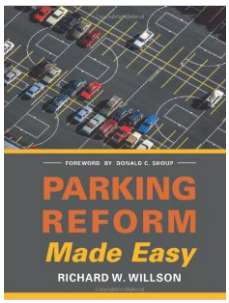

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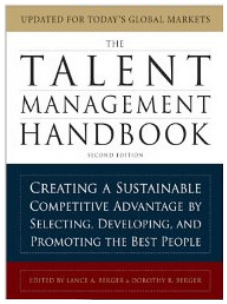

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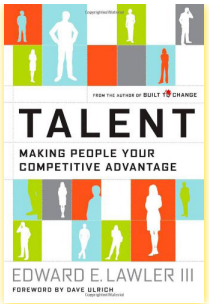

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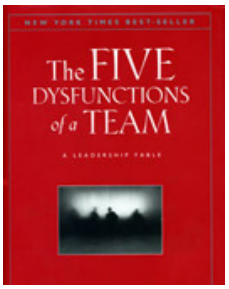

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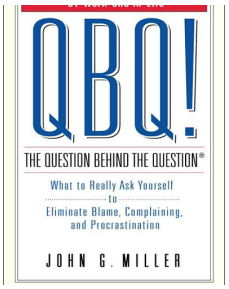

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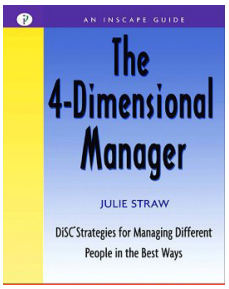

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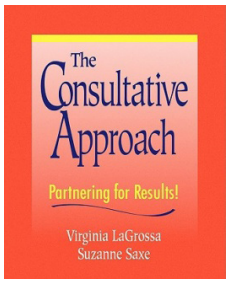

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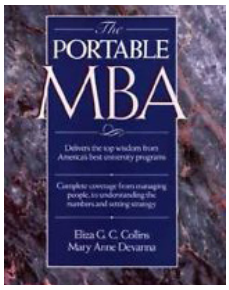

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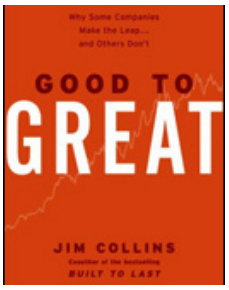

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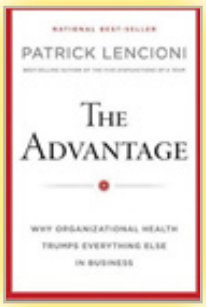

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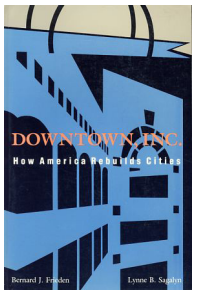

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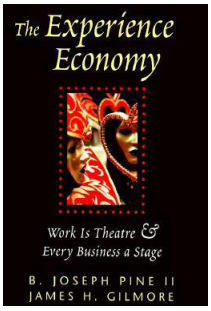

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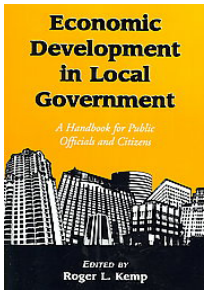

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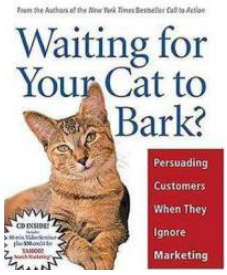

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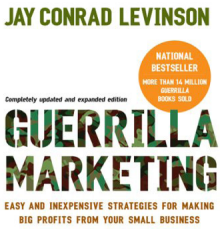

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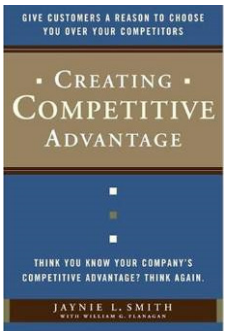

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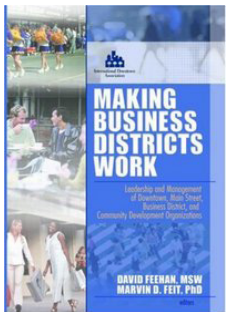

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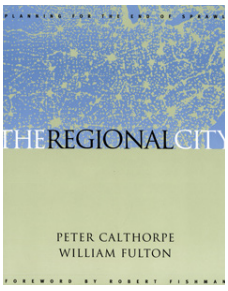

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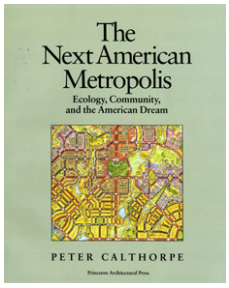

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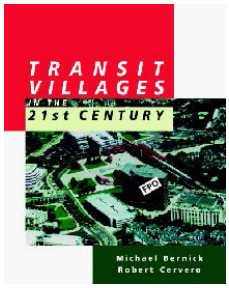

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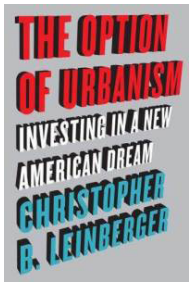

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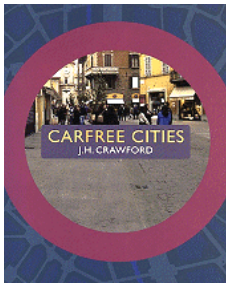

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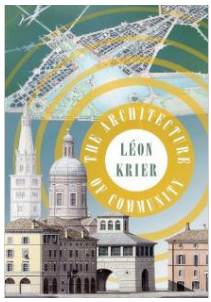

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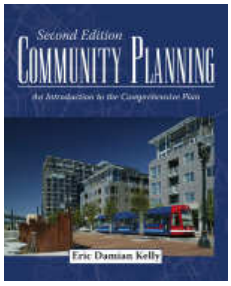

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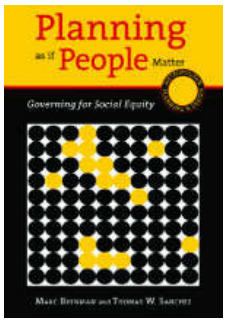

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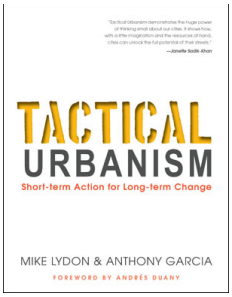

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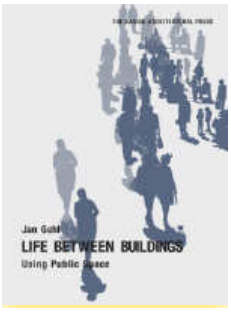

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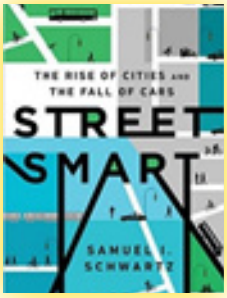

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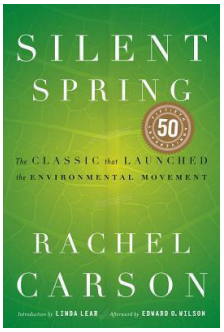

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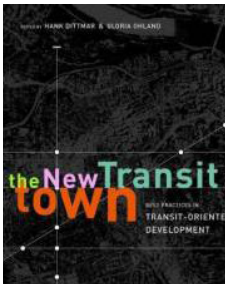

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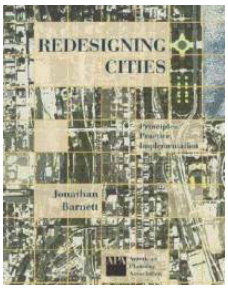

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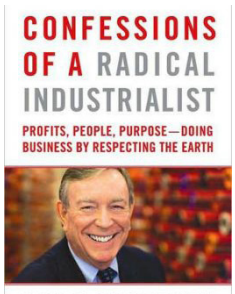

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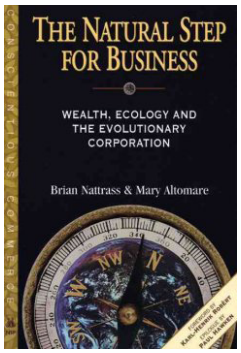

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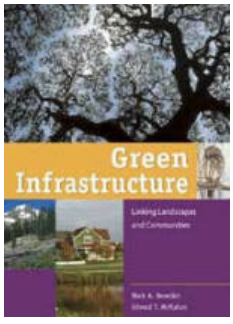

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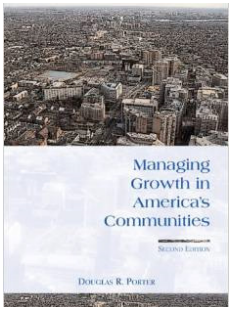

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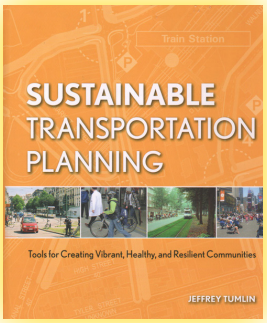

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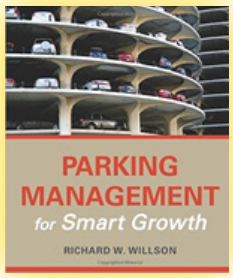

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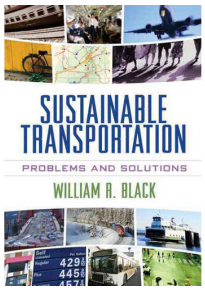

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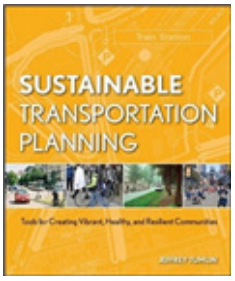

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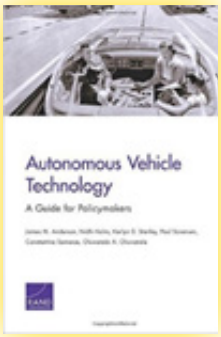

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Appendix 6.

On-Street Parking Technology Whitepaper

Appendix 6

White Paper: On-Street Parking Technology

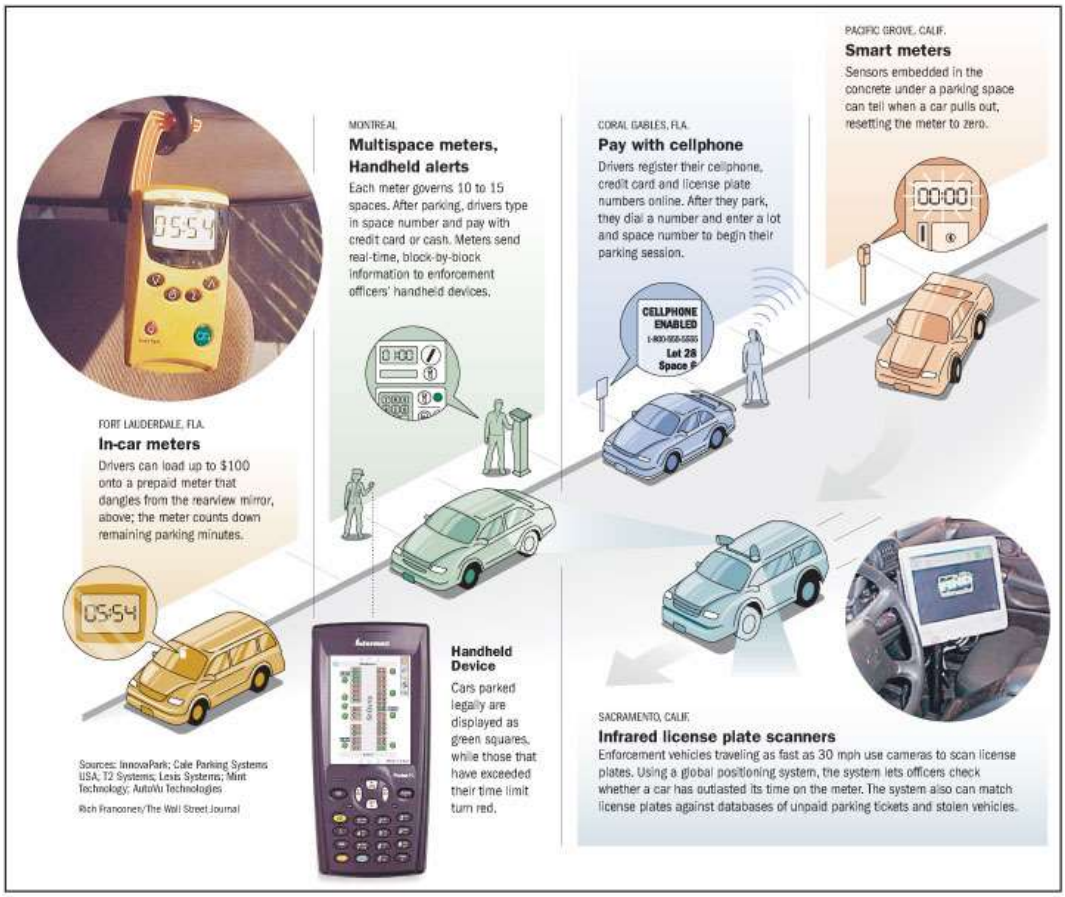
Introduction

This report provides the City of Norman with a summary of current parking meter technology in use today. Our intent in providing this background information is to give you a comprehensive overview of parking meter technology as you prepare for upgrading your on-street meter program. There are many new features and applications that you should be aware of prior to finalizing your equipment RFP.

Over the past decade parking meters have evolved significantly from the traditional coin operated meters to a variety of technologies that include credit card enabled devices, centralized pay stations, and numerous payment methods including pay by cell phone, smart phone applications, in-car meters, etc.

The graphic below, which appeared in the Wall Street Journal, provides a depiction of the type and variety of both revenue control devices and enforcement technology. The following sections describe these technologies, as well as other tools in place today.

Source: Wall Street Journal



On-Street Parking Technology

Operational Methodologies

The following sections provide a summary of current on-street parking revenue control technology devices, including Pay-by-Space Meters, Pay-and-Display Meters, Credit Card Capable Single-Space Meters, and Pay-by-License Plate Meters.

Pay-By-Space

Pay-By-Space is a multi-space meter operational methodology that has grown in popularity over the past decade. The user interface is initially more complicated, but has definite advantages that need to be considered when assessing multi-space meter selection and implementation.

EXAMPLE CITIES THAT USE PAY-BY-SPACE:

- Riverside, CA
- Atlanta, GA
- Raleigh, NC
- Tulsa, OK
- Las Vegas, NV
- Cedar Rapids, IA

This methodology first started in the off-street lots as a replacement option for manual "slot box" systems. These simple "slot box" systems allowed motorists to note the space number where they parked their vehicle, go to the "pay box or honor box", and slip in the proper payment for the amount of time desired into the slot that corresponded to the space number. This allowed the lot to be minimally monitored by the parking operator. Once the electronic version of the honor box was developed (the Pay-By-Space meter) this methodology then migrated to on-street parking where it has grown in popularity.

The basic premise of the Pay-By-Space methodology is that the motorist parks in a space, notes the space number, and proceeds to the closest multi-space meter located near their vehicle. In an on-street application, there are usually one or two machines per block face.

The motorist then operates the multi-space meter as directed by the manufacturer's instructions. Some of the newer meters have instructions right on their digital displays, giving the motorists step-by-step instructions on how to pay for their parking. They may also offer various options at the time of purchase such as the ability to add time or use coupons or special payment cards or codes. The motorist then takes their receipt and continues on to their destination (without having to return to their vehicle to display the receipt).

If all the Pay-By-Space machines are networked, the motorist could actually add more time for their space number at any meter (not just the one on the block face where they parked) as long as they did not exceed the time-limit that applied to their space. The amount of additional time allowed can be assigned on a space-by-space basis as defined in the parking policy rules of the governing agency.

Another important element of a Pay-By-Space system is the need to number each space. Some argue that this requirement defeats the use of multi-space meters to "de-clutter" the streetscape.

In some southern environments with warmer climates space numbering can be accomplished by painting space numbers on the pavement or curbs. However, in northern cities with significant snow accumulation, pole mounted signs are a requirement.

Benefits of Pay-By-Space

1. The motorist does not need to return to their vehicle to display a receipt as proof of payment.
2. Enforcement can utilize handheld devices that allow the enforcement staff to note which spaces are not paid for (or generate a report from each multi-space meter), allowing them to enforce more efficiently than visually inspecting each meter.
3. Used in conjunction with in-street space sensors, occupancy data can be generated for statistical analysis projects for a given area. This data could be useful in determining actual number of vehicles that occupied a given space for a defined amount of time (i.e. a 24-hour period). The data could also aid in determining the amount of revenue collected for the space, and how much potential revenue could have been generated for that particular space, in the specified time period.
4. When the Pay-By-Space system has been networked, payment can be made anywhere within the system. The advantage being, the motorists can make additional time payments at any machine that is operational rather than just the machine near their vehicle.

EXAMPLES OF WELL DONE PAY-BY-SPACE SIGNAGE

The above photo is from Ann Arbor, Michigan e-park program.

The photos above are from the on-street program in Milwaukee, Wisconsin. One positive element of this Pay-By-Space signage is how they incorporated the City's wayfinding signage "downtown district identifiers into the parking space signs.

5. Pay-By-Space systems can offer “pay-by-cell phone” as an option. This option works by the motorist calling a designated phone number, which requires a first time setup. Once the account is activated and tied to a credit card, the motorist pays for their space via their phone.
6. Pay-By-Space systems can also allow motorists the option to “add time” to their current parking space by using a cell phone. This feature is optional, but is seen as a real customer service enhancement. This feature can be set so the motorist cannot park longer than the time limits allow.
7. Pay-By-Space systems have been shown to increase parking revenue up to 40%. This growth in revenue is generated thru more efficient enforcement, freedom of payment (coin, bill, credit card, smart card and cell phone) and a reduction in “borrowed time” from the previous motorist.
8. Pay-By-Space systems provide a less cluttered streetscape while also reducing the amount of infrastructure that needs to be installed. Wireless operations provide standalone systems and remote access to control rates, occupancy and enforcement.
9. Reduces meter maintenance and collections costs. The wireless Pay-By-Space meter can notify you when collections or maintenance are necessary.
10. The Pay-By-Space system software can provide an audit trail both electronically and on paper to prevent theft or fraud in collections.

Disadvantages of Pay-By-Space

1. Motorists forget their space number and have to return to their vehicle to remind themselves of the space number.
2. Motorists enter the wrong space number in the machine and receive a violation. After using the wrong space number, the motorist will return to their vehicle, likely finding that they have received a citation for an expired meter even though they have paid for the parking. The motorist then will have to follow an adjudication process, showing payment to appeal the citation.

3. If the spaces are not properly marked, this can lead to problems with the overall performance of the system. Such problems as those systems in cold weather where the pavement markings or numbered sign posts will be covered by snow and ice. Confusing space signage, as in the photo to the right, would also create significant problems.
4. Regardless of what type of numbering system is used, the numbers are subject to vandalism, wear, abuse, and errors. Any or all of these can negatively affect system performance.
5. In very large cities, numbering systems can get confusing and difficult to manage as well as adding to the maintenance budget.

Pay-And-Display

The Pay-and-Display system has the greatest portion of market share in the US, partly because it was the first model introduced. The motorist parks, then walks to a multi-space meter operating in Pay-and-Display mode. The motorist then pays for the desired duration of parking using coin, cash, credit/debit, or smart card and receives a receipt for payment. The parking patron then returns to their vehicle and displays the receipt on the dashboard or window with the expiration time visible. The displayed receipt proves to the enforcement staff that the space has indeed been paid for through the time printed on the displayed receipt.

EXAMPLE CITIES THAT USE PAY-AND-DISPLAY:

- San Antonio, TX
- Austin, TX
- Denver, CO
- Portland, OR
- Seattle, WA

There are several reasons for the more widespread application of Pay-and-Display systems:

- Pay-and-Display has been in use longer than Pay-By-Space.
- Europe uses Pay-and-Display almost exclusively and only recently have they even considered Pay-By-Space.
- Pay-and-Display is favored for areas that have significant snowfall in the winter. This is because it is more problematic to keep space numbers visible (a requirement for the Pay-By-Space methodology) with snow or ice on the ground. There are also potential problems with snow removal tools accidently causing damage, or vandalism to the numbers used in a Pay-By-Space system.
- Pay-and-Display is a simpler technology to manage as an owner and use as a patron.

Benefits of Pay-and-Display:

1. Pay-and-display is a relatively simple operation, from both the motorist and the maintenance point of view. There are no space numbers to assign to spaces, less street clutter from signage and no maintenance required for space numbers.
2. In this approach, you are buying “time” not a “space”. This can be an advantage because you have what is referred to as “portability of time”. For example, if you paid for 2 hours and came back to your car after 45 minutes, you could drive to another location and park, and the receipt would still be valid for the additional 75 minutes.
3. There is also an argument that because you don’t’ have to designate specific spaces that you can actually increase the number of spaces on a block face. This would depend on a number of factors including available space, number of existing spaces, and typical vehicle space. If you consider that to gain one space you would need to add approximately 20’, there would need to be a lot of space reduction per block face.
4. Eliminates motorist confusion regarding space numbers.
5. All payment forms are available to Pay-and-Display operations, with the exception of Pay- by-Phone. The original transaction could be paid for using Pay-by-Phone systems but an interface with the machine would have to be developed to produce a receipt for display, which could be problematic.
6. Pay-and-Display systems have been shown to increase parking revenue up to 40%. This growth in revenue is generated thru more efficient enforcement and freedom of payment (coin, bill, credit

card, smart card). Additionally, unmarked streets could potentially allow for greater capacity and higher revenue.

7. Pay-and-Display systems provide a less cluttered streetscape while also reducing the amount of infrastructure that needs to be installed. Wireless operations provide standalone systems and remote access to control rates, occupancy and enforcement.
8. Reduces meter maintenance and collections costs. The wireless Pay-and-Display meter can notify you when collections or maintenance is necessary.
9. The Pay-and-Display system software can provide an audit trail both electronically and on paper to prevent theft or fraud in collections.

Disadvantages of Pay-and-Display:

1. Motorists must return to the vehicle to display the printed receipt as proof of payment. This requirement is more problematic in certain environments with extremes in temperature, heat, snow and ice conditions, or extremes in topography.
2. While the use of electronic devices to issue citations is compatible in Pay-and-Display operations, visual inspection of each displayed receipt is required to determine if the vehicle is in violation.
3. Pay-by-Phone is not readily compatible with Pay-and-Display operations as there are no space numbers to associate with the vehicle.
4. With Pay-and-Display the motorist cannot add to the amount of time paid for parking without having to return to their vehicle to purchase additional time, which then has to be displayed in their vehicle.
5. Vehicle sensors and related technologies are problematic in combination with Pay-and-Display meters. Since there are no assigned space numbers (or in some cases even defined spaces) it is difficult to track parking occupancy, duration of stay and other key factors.

Credit Card Capable Single-Space Meters

A viable alternative to multi-space meters that provides many of the primary benefits (at least regarding improved customer payment options, ease of use and back-end software support) is credit card capable single-space meters. Currently, only a few vendors provide the option to retrofit current single-space meter housing with an electronic mechanism that can perform on-line credit card transactions as well as continued acceptance of coin, smart card and cell phone payments. Credit card capable single-space meters need to meet the Payment Card Industry (PCI) security standards. Credit card transactions are encrypted and authorized, and only the last four digits of each credit card number are stored within the meters for security purposes.

EXAMPLE CITIES THAT USE CREDIT CARD CAPABLE SINGLE-SPACE METERS:

- Austin, TX
- Los Angeles, CA
- Washington, DC
- San Francisco, CA
- San Diego, CA

Benefits of Credit Card Capable Single-Space Meters:

1. Because these new meters look like the conventional single-space meters that everyone knows, there is little to no special training needed.
2. Also, because they are so familiar looking, everyone intuitively knows that if you park in a space with a meter, that payment is expected (unlike with a switch to multi-space meters where the meter may be half a block away).
3. From a convenience perspective, the meter is located immediately at the head of each stall with no need to walk to a multi-space meter (and potentially back to the car to display a receipt).
4. The meters provide multiple customer payment options including electronic payment methods (i.e., credit cards, smart cards, etc.).

5. Increased credit card/smart card usage translates to reduced coin collection and handling.
6. Previous installations have demonstrated significant potential to increase the average revenue per meter by allowing for payment by credit card.
7. Improved security due to cashless transactions and reduced need for coin collection, counting and handling.
8. Reuse of existing meter bases and poles for implementation of meters.
9. Meter rates and schedules can be automatically and electronically updated to new meter heads using GIS and RFID technologies.
10. System rate programming and utilization data can be downloaded from a central location.

Disadvantages of Credit Card Capable Single-Space Meters:

1. Higher up-front cost for credit card capable meters than for conventional meters.
2. Credit card companies charge transaction fees ranging from 1-3% for large volumes and 3-6% for smaller merchants with low volumes.
3. Ongoing costs for wireless services and management system access.
4. Credit card number information could potentially be skimmed if physical access is obtained to the credit card reader's circuitry and the reader is tapped.

Pay-by-License Plate

Pay-by-license plate is an operating methodology that has been brought from Europe to the U.S. and Canada. Rather than using space numbers, this operating method requires motorists to pay for parking by entering their license plate number (as well as parking zone, if applicable) into a multi-space meter or cell phone payment system.

EXAMPLE CITIES THAT USE PAY-BY-LICENSE PLATE:

- Washington, DC (Pilot Study)
- Pittsburgh, PA (Recently Implemented)
- Eugene, OR (Limited Implementation)
- Whistler, British Columbia, Canada
- Calgary, Alberta, Canada
- Missoula, MT (Off-Street)

While this works well in Europe, this methodology has been slower to take hold in the U.S., due to U.S. license plate numbers. Europe uses a standard license plate with straight-line numbers assigned by country. Europe does not allow vanity plates or special characters. In the U.S. the numbering systems varies by state with special plates, vanity plates, special characters and other items that complicate the entering of the "number." The success of the system will be contingent upon motorists remembering their own specific license numbers, and the ability of the system to accept specialized information.

Below are the fundamental steps in the pay-by-license plate/zone process:

1. **Vehicle parks in a zoned area**
   - Each metered space is located within a zone, with signage indicating zone numbering
   - Motorist uses multi-space meter or Pay-by-Phone option for payment
   - Motorist enters zone and license plate information
   - Motorist pays applicable parking rate
2. **License plate and payment information stored in a real-time database**
   - License Plate Recognition (LPR) equipped vehicle patrols zones
   - LPR Patrol takes digitized picture of parked vehicle's license plate
3. **License Plate Recognition Patrol Communicates with system database**
   - Database informs LPR Patrol of vehicle's payment status
   - If expired, a violation with photo, is processed and mailed to the vehicle owner
   - LPR Patrol continues route enforcement

Calgary is a great example of a successful implementation of this operating method in North America. In Calgary, the pay-by-license plate process utilizes both multi-space meters and pay-by-cell phone technology. For parking enforcement, the system incorporates a mobile License Plate Recognition (LPR) system. The LPR system allows the City to gather parking utilization data by date, time and zone. This data allows the City to better analyze parking usage, needs and enforcement patterns. Additionally, the City is able to effectively adjust parking rates to encourage short-term on-street parking while encouraging long-term parkers to utilize less expensive off-street parking facilities.

Benefits of Pay-by-License Plate:

1. Pay-by-License Plate cleans up streetscape by eliminating traditional per space meters.
2. Pay-by-License Plate eliminates the need for numbering spaces
3. Pay-by-License Plate provides the flexibility of taking your time with you to another parking space, similar to that of Pay-and-Display.
4. Reduces human error in enforcement and allows enforcement officers to patrol larger areas in less time.
5. Applicable with Pay-by-Phone integration for additional time and warnings for time expiration.
6. Versatility in payment options and locations. Pay-by-License Plate allows the motorist to pay at any location.

Disadvantages of Pay-by-License Plate:

1. Most motorists don't have their license plate memorized.
2. Requires additional License Plate Recognition equipment and software to be installed in order to assist enforcement.
3. License Plate Recognition does have a margin of error in when reading license plates.
4. Public perception of the license plate recording as a violation of privacy.
5. In cold climates with snow and ice buildup on and around the license plate can render the License Plate Recognition almost useless.

Additional Payment Technologies

The following sections provide a summary of additional payment technologies that can be used as either an add-on, or in some cases, a standalone payment method. These technologies include Pay-by-Cell Phone, Smart Cards, In-Car Metering, and one of the newest payment methodologies, Smart Phone Applications.

Pay-by-Cell Phone

The Pay-by-Cell Phone system is just as it sounds – once the motorist has parked their vehicle, they then call a phone number, send a text, or use a smartphone application to begin the transaction. Once the transaction is initiated, the customer will enter the space number they're parked in and then complete the transaction. There is an initial, one-time set-up where the credit card number is matched with a phone number and a license plate of the vehicle(s) on the account. After the initial setup, the system then uses caller ID to match the user with the account or another type of account ID.

EXAMPLE CITIES THAT USE PAY-BY-CELL PHONE:

- San Francisco, CA
- Washington, DC
- Albuquerque, NM
- Denver, CO
- Long Beach, CA

Pay-by-Cell Phone has been in use for a few years, however, the latest utilization numbers indicate that only 3% of those parking in a location that supports this technology use it on a regular basis. However, many parking professionals see this as the parking technology with the great potential going forward.

The big advantage of this type of system is the ability to "add" time remotely from your cell phone, especially in commuter lots. If the motorist, who planned to stay half an hour, decides to extend their trip for additional shopping or dining, they can call the number provided and "add" time to their parking to avoid a violation. Once the customer has paid for the maximum time allowed (per posted time limits) adding more time is not allowed.

Benefits of Pay-by-Cell Phone:

1. Eliminates the need to carry cash or coins when parking on-street
2. Warning text messages notify the motorist that their meter time is close to expiring and allows them to extend time remotely from anywhere, including a local restaurant or store.
3. Eliminates the need to stop at a meter to pay - simply identify your parking space number, dial the appropriate enforcement number and proceed to your destination at the same time.
4. Receipts can be viewed and printed online from your established Pay-by-Cell Phone account.
5. Handheld devices notify enforcement officers exactly where and when a time will expire and allows them to proactively move in that direction.

Disadvantages of Pay-by-Cell Phone:

1. Not everyone has a cell phone.
2. Requires each space to be numbered and if not properly marked this can lead to problems with the overall performance of the system. Such problems as those systems in cold weather where the pavement markings or numbered sign posts will be covered by snow and ice. Confusing space signage would also create significant problems.
3. Each motorist is required to set up an account with a credit card number linked to that account.
4. Some external companies that operate the payment processing can charge fees per transaction or apply a monthly user fee.

Smart Cards

Smart cards provide a mechanism to pay for parking (and potentially other services) with a single card. Merchants sell the smart card, and load/reload value on the cards with cash or credit/debit, similar to how a gift card works at retail stores. The Smart Card is then inserted into the parking meter and the cost of parking is deducted from the Smart Card.

EXAMPLE CITIES THAT USE SMART CARDS:

- Denver, CO
- Charleston, SC
- Boston, MA
- Des Moines, IA
- Philadelphia, PA

Benefits of Smart Cards:

1. They are very convenient for users - no need to carry coins or tokens. Some cards even utilize contactless communications.
2. Improved security due to cashless transactions and reduced need for coin collection, counting and handling.
3. Reduced vandalism because parking revenues are stored electronically instead of in coin format.
4. They can be used with other systems or as a new “stand alone” system.
5. The parking system receives payment “up front”.
6. Motorists receive receipt whenever parking time is purchased.
7. Unique card numbers provide for additional features such as disallowing extra payments with the same card past the legal parking time limit, and refunding unused time back to a card.
8. Cards can be used to promote an image or brand.
9. Merchants participate in value chain “economics”.
10. Pricing flexibility on rate increases.

Disadvantages of Smart Cards:

1. Value is stored in the card, and if the card is lost or stolen, the value is lost.
2. Customers must purchase cards in advance.
3. Limited locations where value can be added (if user cannot add time via cell phone or online).
4. Smart card programs are generally not economically viable unless widely utilized by a large portion of the target market.
5. There is a high implementation and operation cost for the smart card system.
6. Interoperability with other agencies' smart card systems can be challenging.
7. Smart card programming can be hacked to obtain unlimited free parking on the card.

In-Car Metering

The in-car meter allows the parking operator to sell a small metering device, which remains in the car, to a motorist. The motorist pre-pays for parking by adding time to this device, usually by taking it into a location that will "add time" to the system. In another version of in-car meters, time is added to the meter via cell phone.

When the motorist parks, the motorist activates the in-car meter device, which usually has a digital readout indicating that the motorist has "paid" for the parking they're using.

EXAMPLE CITIES THAT USE IN-CAR METERING:

- Fort Lauderdale, FL
- Arlington, VA
- Miami, FL

These devices have not caught on in large numbers throughout the U.S., but still remain a good alternative for those parking systems with a large regular or repeating customer base that would benefit from this type of device.

Benefits of In-Car Metering:

1. In-car meters can be programmed for multiple parking zones, with different rates for each zone.
2. They can be used with other systems or as a new "stand alone" system.
3. Controlled parking areas can be increased by adding in-car meters only in fringe areas with minimal capital investment.
4. They are very convenient for users - no need to carry coins or tokens, or to interface with parking revenue control equipment.
5. The system is fair - charging only for the actual time parked.
6. The parking system receives payment "up front".

Example instructions for motorists (*taken from City of Fort Lauderdale, FL website*):

The SmartPark device uses a SmartCard that's loaded with a prepaid amount of parking hours. The SmartCard is inserted into the SmartPark, which is then placed inside the vehicle and displays the parking zone selected. The SmartPark unit is a one-time $55 (plus sales tax) purchase and customers must purchase the SmartCard for a one-time fee of $10. Customers can preload the SmartCard in increments of $25, $50, $75, $100, $150, $200, and $250.

7. Motorists receive receipt whenever parking time is purchased.

Disadvantages of In-Car Metering:

1. If value is stored in the device and the device is lost or stolen, the value is lost.
2. Customers must purchase meters and time in advance.
3. Limited locations where value can be added (if user cannot add time via cell phone or online).
4. Motorists may forget to turn meter on, resulting in a parking violation.
5. Motorists may forget to turn meter off, resulting in wasted parking time.
6. Meter batteries have to be replaced.

Smart Phone Applications

Similar to the pay-by-cell phone methodology described previously, the motorist is able to pay for their parking transaction using a Smart Phone application. This technology is relatively new, and is currently in limited markets. The motorist must download the application to their Smart Phone. The application could either be free or cost a nominal purchase fee (usually less than $5).

Most applications require the motorist to register online, or through their phone, prior to the first usage. The motorist will have to store a credit card on file, just like the pay-by-cell phone system. After initial registration, the motorist locates a parking meter, opens the application, and then pays for their transaction.

Some of the newer applications not only allow you to pay for parking, they also help you locate available parking. One of the early methods of this premise relied solely on its network of application users. If you were a user of this (titled OpenSpot and developed by Google), you would use your application not only to find parking, but also to notify other application users of available parking. The methodology included opening the application and indicating that you had left a spot, which notified other users of the space, and gave you "Karma Points" which indicated your level of parking generosity. While a primitive method (albeit, with a tech savvy approach) for locating parking spaces, it symbolizes that the parking public is looking for easier methods to find open spaces and reduce cruising.

Newer and more advanced applications that use either parking operator back end data or in-street sensors are able to actually provide real-time occupancy information and location of available spaces. These applications are relatively new and are being marketed as a solution for cruising and delay related to hunting for that last on-street space. These applications also let you pay for parking, and just like the

pay-by-cell phone method, will provide you notifications when you are about to exceed your time and allow you to add time up to the regulated limit.

Benefits of Smart Phone Applications:

1. Provides real time information related to parking occupancy
2. Can provide turn-by-turn directions to available parking
3. Eliminates the need to carry cash or coins when parking on-street
4. Warning text messages notify the motorist that their meter time is close to expiring and allows them to extend time remotely from anywhere, including a local restaurant or retail store.
5. Eliminates the need to stop at a meter to pay - simply use your application and proceed to your destination at the same time.
6. Receipts can be viewed and printed online from your established application account.
7. Handheld devices notify enforcement officers exactly where and when a time will expire and allows them to proactively move in that direction.

Disadvantages of Smart Phone Applications:

1. Not everyone has a Smart Phone.
2. If the wireless network is not operating, the application is not functional.
3. Requires user to download application to their Smart Phone, which could have a cost.
4. Requires each space to be numbered and if not properly marked this can lead to problems with the overall performance of the system. Such problems as those systems in cold weather where the pavement markings or numbered sign posts will be covered by snow and ice. Confusing space signage, as in the photo on the following page, would also create significant problems.
5. Each motorist is required to set up an account with a credit card number linked to that account.
6. Some external companies that operate the payment processing can charge fees per transaction or apply a monthly user fee.

Specific Meter Benefits

The following subsections provide a brief overview of several potential smart meter benefits, and provide a generic scoring to define how well each of the previously described meter technologies provide these benefits.

Flexible Payment Methods Benefit Rankings

Digital Coin Meters	(
Pay-by-Space	!
Pay-and-Display	!
Credit Card Capable Meter	!
Pay-by-License Plate	!
Pay-by-Cell Phone	<
Smart Cards	<
In-Car Metering	<
Smart Phone Applications	<

Flexible Methods of Payment

One of the primary reasons for upgrading your on-street revenue control equipment is to provide your customers with more payment options. Up until the past decade, most on-street revenue control equipment has been limited to coins, with the addition of pre-paid cards or cash keys in some instances. The newest technology allows for much more flexible payment options, including credit cards, bills, coins, smart cards, and pre-paid metering devices.

!	Maximum Benefits
<	Marginal Benefits
(	Limited Benefits

- **Credit/Debit Cards** – the use of credit/debit cards is available in all of the devices that are being evaluated for this study. Both the multi-space meter and the single-space credit enabled meter use the credit/debit card as their primary payment device. All of the other add-on payment options (pay-by-cell, smart cards, in-car metering, and smart phone applications) use credit card payment to either pre-pay the transaction or pay for the transaction virtually through a pre-stored credit card.

- **Coins** – All of the on-street metering options allow for payment via coin. In some situations, cities have chosen not to allow coin payment to force motorists to pay via credit card, but this application is extremely limited, given the fact that some members of the population either prefer not to use or don't have credit/debit cards. The add-on features typically do not allow coin payment, although technically a person-to-person transaction for loading a smart card or in-car meter could be paid via coins.

- **Cash** – the use of paper money in the newer on-street revenue control equipment is fairly limited. Some meter types allow for it, but the cost of maintaining and monitoring that system is fairly high, for several reasons. First, the storage space for bills in most of these machines is small, so a heavier occurrence of bill usage would mean more collections. Second, a large occurrence of paper money stored in the machine adds the incentive for vandalism. Third, and most importantly, the use of bills creates an increased maintenance situation as the fibers from the bill tend to accumulate in the reader over time, causing jamming and malfunctioning problems. In locations with high rainfall, humidity, or snow accumulation, the moisture can also create issues with the bill acceptor and cause further jams.

- **Alternative Payment Methods** – the alternative methods described in the initial research document, including pay-by-cell phone, smart cards, in-car metering, and smart phone applications, are all compatible with the newer on-street revenue collection equipment, including both the multi-space meter and the single-space credit enabled meter.

Cleaner Streetscape

The notion of a cleaner streetscape is typically attributed to the multi-space meter devices, because they are the most likely to remove the visual and physical clutter associated with individual parking meters affixed at each parking space along a block. The notion of cleaner streetscape is an urban design initiative, with the additional street space gained from removing meter poles rededicated to pedestrian use, restaurant and retail activity, and enhanced streetscape.

The meter technology that best fits this notion is pay-and-display, which only requires the multi-space parking meter to regulate parking on the block. Under the pay-and-display system, you can even remove pavement space markings for your meters. The only installation needed in these systems is the meter itself and the appropriate signage indicating where to pay for parking.

Cleaner Streetscape Benefit Rankings

Digital Coin Meters	(
Pay-by-Space	<
Pay-and-Display	!
Credit Card Capable Meter	(
Pay-by-License Plate	!
Pay-by-Cell Phone	(
Smart Cards	(
In-Car Metering	(
Smart Phone Applications	(

!	Maximum Benefits
<	Marginal Benefits
(	Limited Benefits

Pay-by-license plate is similar to pay-and-display in its ability to remove clutter. Assuming that the appropriate signage is minimal, the pay-by-license plate system can be limited to the meter and signs. The pay-by-license plate system will need signage that indicates instructions for how to enter your license plate number, what particular zone you are in, and how to pay. All of this signage can be located at or on the machine, reducing much of the clutter. In regards to zone numbers, these especially need to be advertised well in conjunction with a pay-by-cell system to allow for adding time from any location in the community.

Pay-by-Space can be just as effective at de-cluttering street space through the removal of individual parking meters, assuming that climate and local conditions do not require the installation of pole mounted space numbering systems. If the space markings are able to be painted on the asphalt, curb, or both locations, you essentially remove the vertical clutter, which frees up the curb space for additional pedestrian and business use. Similar to pay-and-display (in climates with no snow accumulation) can be limited to the installation of the meter and the appropriate signage.

The single-space credit enabled meter does not reduce the visual and physical clutter, because like the current digital meter technology, the meters are placed at each parking space.

Additional add-on features don't provide much impact in the way of de-cluttering streetscape, because most are tied in with an actual metering system. Pay-by-cell phone and in-car metering have replaced actual meters in other countries, but for applications within the United States, it is still necessary to provide a physical parking meter for motorists who either don't have a cell phone, or access to an in-car metering device.

Ability to Add Time from Anywhere

One of the features of the newer revenue collection equipment is the ability to add time from anywhere in the system. For example, if a motorist parks and then visits several destinations throughout the downtown and then realizes that they are four blocks away and about to run out of time, they can go to the nearest pay station and add more time. This system only works with a pay-by-space, pay-by-license plate, or pay-by-cell phone system (including smart phone applications).

Ability to Add Time Remotely Benefit Rankings

Digital Coin Meters	(
Pay-by-Space	!
Pay-and-Display	(
Credit Card Capable Meter	(
Pay-by-License Plate	!
Pay-by-Cell Phone	!
Smart Cards	(
In-Car Metering	<
Smart Phone Applications	!

!	Maximum Benefits
<	Marginal Benefits
(	Limited Benefits

This feature is an added benefit for consumers and allows your downtown parking system to be more user-friendly and dynamic. For this system to be truly effective, you will need to market this feature and have appropriate signage on parking meters notifying customers. Many communities have this feature, but because it is not properly communicated, the benefit is lost on the unknowing consumer.

From a pay-by-cell phone component, this feature is typically communicated by the pay-by-cell vendor, either through online user registration or notification text messages. The ability to provide these notification texts is quickly growing as one of the primary features that downtown parkers respond to and appreciate. While this might lower the number of overtime citations written in the downtown, the positive reinforcement from downtown parkers through increased time and money spent in the downtown will offset this lost revenue.

Portability

Portability of Time Benefit Rankings

Digital Coin Meters	(
Pay-by-Space	(
Pay-and-Display	!
Credit Card Capable Meter	(
Pay-by-License Plate	<
Pay-by-Cell Phone	<
Smart Cards	(
In-Car Metering	!
Smart Phone Applications	(

!	Maximum Benefits
<	Marginal Benefits
(	Limited Benefits

The concept of portability of time refers to the ability of a motorist to take their remaining paid time with them when they leave the parking space. The only meter system that truly provides portability of time is the pay-and-display meter. Because the motorist is paying for a period of time, rather than a specific space, the time is transferable within the parking area (specific zones or areas may be defined). The pay-by-license plate system can also set up to be transferable, depending on the size and location of parking zones.

This feature is another added benefit for consumers, especially those who move around the downtown area frequently, such as shoppers who move from retail area to retail area, or delivery drivers. Much like the previous benefit, for the portability of time to truly be an effective benefit, there needs to be good marketing and communication of the feature so that motorists understand that they can take their time with them.

Eliminates "Borrowed Time" Transfer

One of the biggest drawbacks of the traditional single-space meter (from an operations and revenue collection point of view) is the lost revenue from "Borrowed Time". Borrowed time (or found time in the eyes of the consumer) is the remaining time on a meter, from the previous parking space inhabitant, that is utilized by a new motorist. Because of this found time, the motorist does not need to pay for a full duration of stay, because the previous motorist left them their overage.

Elimination of Borrowed Time Benefit Rankings

Digital Coin Meters	(
Pay-by-Space	!
Pay-and-Display	!
Credit Card Capable Meter	<
Pay-by-License Plate	!
Pay-by-Cell Phone	!
Smart Cards	!
In-Car Metering	!
Smart Phone Applications	!

!	Maximum Benefits
<	Marginal Benefits
(	Limited Benefits

All of the researched meter technologies have the ability to eliminate this borrowed time, although some need additional features to realize the full elimination of borrowed time. All of the multi-space meters eliminate borrowed time, basically by requiring the motorist to start a new transaction on that space. For example, in a pay-by-space system, the previous motorist might have left 15 minutes on their space, but the new motorist will have not been aware of this borrowed time once they start their new transaction.

In a pay-and-display system, because the previous motorist was paying for a block of time, once they leave, the next motorist has to pay for their own block of time. Pay-by-cell, pay-by-license plate, and smart phone applications are all similar in that they require the next user to begin a new transaction, essentially voiding, or zeroing out remaining time. However, the voided time is still paid for by the previous user, so there is an opportunity for the City to collect additional revenue for the overlapping time.

The only system that does not expressly eliminate borrowed time is the single-space credit capable meter. To truly zero out time or eliminate borrowed time, the single-space meter needs a vehicle sensor to notify the meter that the previous vehicle has left, which zero's out the remaining time.

Reduces Maintenance and Collection Costs

Reduced Maintenance and Collections Benefit Rankings

Digital Coin Meters	(
Pay-by-Space	!
Pay-and-Display	!
Credit Card Capable Meter	<
Pay-by-License Plate	!
Pay-by-Cell Phone	!
Smart Cards	!
In-Car Metering	<
Smart Phone Applications	!

!	Maximum Benefits
<	Marginal Benefits
(	Limited Benefits

All of the new technologies reduce maintenance and collections costs in some form or fashion, typically through better responsiveness to each element. Maintenance and collections are two of the highest and most frequent administrative costs associated with on-street parking management. Maintenance of the traditional on-street parking meter system usually requires either constant meter observations (including frequently checking each meter on a route) or responding to complaints and notices from motorists or enforcement officers. Collections for traditional on-street meters usually requires a collection employee following a route or a beat, collecting certain meters on certain days, whether the meter has five cents or five hundred dollars in it.

The new technologies all provide some level of improvement over these methods. For the meter technologies, each of the technology types provides better real time information to help determine when and where to deploy maintenance and collections employees. For

example, both multi-space and credit card enabled single-space meter systems provide notifications when they reach a certain threshold of currency, to allow for proper collection timing. In addition, they can provide the same data about battery levels, paper availability, paper jams, and mechanical issues. This allows parking management to deploy employees in reaction to problems, rather than along maintenance or collections routes.

Additionally, the use of credit cards as a form of payment reduces the physical currency that has to be collected from meters. For example if a meter that used to hold two hundred dollars in quarters (800 coins) now has fifty percent credit card usage, the meter can go twice as long without needing to be collected. Along these same lines, pay-by-cell phone, smart cards, in-car metering, and smart phone applications all provide lower collections cost, through increased credit card usage. Additionally, these applications don't add to the wear and tear of the meters themselves, which helps reduce maintenance needs.

For the benefits ranking system noted in the table on the previous page, the single-space credit enabled meter receives a lower ranking, only because the use of this technology requires a larger number of meters, which will naturally require more maintenance for the volume of meters. However, these meters have the same capability of the multi-space meters to provide real-time input related to maintenance needs and collection times.

Eliminates "Visual Inspection" Enforcement

Under traditional on-street meter systems, enforcement officers must visually inspect or observe each parking meter to determine whether there are violations, including staying over time limits, not paying, or illegally parking. With each of the new meter technologies, there is an enhanced approach to enforcement that helps improve efficiency, and in some cases, react to violations rather than searching for them.

For the pay-by-space system, the locating of parking violations is as easy as the enforcement officer going to the pay station, printing a report that details payment by space, and then moving to spaces in violation. This report can also be pushed to handheld devices that the officers utilize, which will improve efficiency even further, allowing officers to check compliance as the enter an area or start down a block.

Eliminates "Visual Inspection" Enforcement Benefit Rankings

Digital Coin Meters	(
Pay-by-Space	!
Pay-and-Display	<
Credit Card Capable Meter	<
Pay-by-License Plate	<
Pay-by-Cell Phone	(
Smart Cards	(
In-Car Metering	(
Smart Phone Applications	(

!	Maximum Benefits
<	Marginal Benefits
(	Limited Benefits

The new single-space credit capable meters provide a more enhanced version of the current enforcement method – the flashing red light. In traditional on-street meter technology, when a meter is not paid, the screen flashes red, indicating either a violation or an unpaid meter. The new version of this technology uses LED lighting to indicate the violation. The concept is basically the same, but the newer version is easier to distinguish for enforcement officers, from further distances.

Pay-and-display and pay-by-license plate can both provide more advanced data related to number of paid parkers, but enforcement still requires some level of visual inspection. For pay-and-display, the enforcement officer must visually inspect each vehicle to ensure that the receipt indicates payment. With the pay-by-license plate system, the officer must visually inspect license plates, either manually, with a handheld device, or with a mobile license plate recognition system.

The add-on payment options don't provide any measurable benefits related to enforcement, because the primary source of enforcement information will still come from the parking meters.

Improved Maintenance (Pavement Markings or Signage)

Depending upon the meter technology selected, there might be additional maintenance needs or reductions, based on the level of pavement or curb markings and signage. For example, pay-by-space technologies will require space numbering painted on the curb or a sign, which will require additional maintenance to ensure that numbers are visible and legible. Additionally, all multi-space meter equipment will require signage directing motorists to the pay station for parking. This signage usually requires posted signs at each end of the block directing motorists to the centrally located pay station, as well as a sign at the pay station identifying that as the payment location.

Improved Signage and Pavement Marking Maintenance Benefit Rankings

Digital Coin Meters	!
Pay-by-Space	<
Pay-and-Display	<
Credit Card Capable Meter	!
Pay-by-License Plate	<
Pay-by-Cell Phone	(
Smart Cards	(
In-Car Metering	(
Smart Phone Applications	(

!	Maximum Benefits
<	Marginal Benefits
(	Limited Benefits

Single-space credit enabled meters don't require any additional signage over the current levels provided, and can actually reduce needed directions and/or signage that is posted directly on the traditional meter (i.e. time limit and regulatory stickers) by posting that information on the digital interface. The single-space meters also don't require space numbering on the pavement, even in a numbered system. The numbered system would be required due to the use of pay-by-cell phone, which would be connected to specific space numbering. With the single-space system, the space numbering can be included on the meter, or even in the digital interface.

The add-on payment options don't provide any measurable benefits related to reduced maintenance, because the primary maintenance requirements will still come from the parking meters.

Ease of Use

Ease of use measures the complexity of each technology, in terms of user interface and operations. All of the new technologies are rated fairly high in this category, because they have been designed to provide easy operations and use. The only two technologies that score marginal are pay-by-space and pay-by-license plate, because they require the user to input either a space number or license plate number, which increases the difficulty of the transaction.

Ease of Use Benefit Rankings

Digital Coin Meters	!
Pay-by-Space	<
Pay-and-Display	!
Credit Card Capable Meter	!
Pay-by-License Plate	<
Pay-by-Cell Phone	!
Smart Cards	!
In-Car Metering	!
Smart Phone Applications	!

!	Maximum Benefits
<	Marginal Benefits
(	Limited Benefits

Pay-and-display is widely considered the easiest multi-space meter technology, requiring the user to pay and then return the valid receipt to their vehicle. Single-space credit enabled meters are also considered to be easy to understand and operate, primarily because they are so similar to the existing technologies. Pay-by-cell phone has an initial setup that requires a little more effort on the part of the consumer, but after this setup the use and operation is as easy as a phone call or text message to initiate service. Similarly, smart phone applications simply require the push of a

button to initiate parking transactions, as well as find available parking, and information about rates and restrictions.

Walking Distance Benefit Rankings

Digital Coin Meters	!
Pay-by-Space	<
Pay-and-Display	(
Credit Card Capable Meter	!
Pay-by-License Plate	<
Pay-by-Cell Phone	!
Smart Cards	(
In-Car Metering	!
Smart Phone Applications	!

!	Maximum Benefits
<	Marginal Benefits
(	Limited Benefits

User Walking Distance

The comparison of walking distances is based on how far each motorist must go to complete a transaction and move towards their destination. All of the technologies score fairly high in this regard, because walking is confined to the distance from the car to the meter and then from the meter to the destination.

Pay-and-display technology requires the most walking distance, requiring the user to walk to the pay station and then back to their vehicle before they can move on to their destination. Pay-by-space and pay-by-license plate requires less walking distance, but still requires the user to walk from their vehicle to a pay station and then to their destination, which may be prohibitive if the pay station and the destination are in opposing directions. The single-space credit enabled meter does not increase the existing walking distance because it is configured exactly like the traditional meter.

Pay-by-cell phone and smart card applications actually reduce walking distances, because the user can complete the transaction as they walk to their destination. In-car metering also does not require additional walking distances, because the parking transaction is initiated in the vehicle. Smart cards don't really have any impact on walking distance, because the user must still travel to the meter to initiate payment.

Collections and Maintenance – General Benefits

Collections and maintenance benefits are not vendor specific, but rather should be improved with the implementation of new parking machinery. Several of our previous clients have indicated to us that increased credit card usage and larger coin cashboxes have reduced the number of times the change in a meter needs to be collected. In addition, the meter technology informs parking management of which meters are approaching capacity and need to be collected, instead of making collection rounds regardless of the amount of money in the meter. As a result, collection costs have decreased since employees only have to collect money when necessary. One of the cities mentioned that their single-space meters are collected based on the fullness of the cashbox. As a result, some meters are collected weekly while others are collected monthly.

Similarly, peer cities have also indicated that maintaining the meters has become more efficient with the new parking meter technology. Maintenance personnel no longer have to learn about a meter failure from a citizen or from a parking officer. The meters send a text or email to parking management and maintenance staff when the meters have an issue, allowing maintenance personnel to track and solve maintenance issues quicker and more efficiently. However, the cities indicated that even though maintenance issues could be identified easier, this did not necessarily translate into reduced maintenance costs. Instead, the costs have been shifted to retrain staff and technicians on how to appropriately work on the new parking meters and its features. Additionally, maintenance funds also need to be set aside to pay for parts once the warranty expires. Administration costs also have been shifted with implementation of the new technology. The new technology provides data and reports that

are useful to parking personnel for a number of reasons. However, personnel have to be trained on the new software associated with the data, and new field devices have to be acquired to record and access the data. Although collection and maintenance benefits are inherent with the implementation of new technology, there will be offsetting demands from staff training and operations that will lessen the implied impacts of the installation.

Secondary Features

The following section provides an initial look at some key secondary features that support the previously described technologies. The review of secondary features includes information provided by parking meter vendors as well as industry research conducted by Kimley-Horn.

Solar Power Backup

Most new parking meter technologies take advantage of solar power to enhance battery life and promote sustainable energy use within the parking system. Many communities are implementing solar powered machines as a function of reduced cost. With the addition of a self-sustaining power source, meters no longer need underground power mains, which have the potential to lower implementation costs significantly.

In the southwestern part of the country, the use of completely solar meters is more likely sustainable than in the northwest where rain and overcast skies can drain a system. However, the parking meters don't necessarily need direct sunlight to operate. Many meters are designed to operate with ambient light sources only recharging internal sealed lead acid batteries, which are capable of completely powering the machines. In the event that the panels fail and the battery voltage drops too low, the meters typically have a backup power source that they can automatically roll over to.

Many of the systems have battery lives of five to seven years, which is a stark improvement over the traditional coin meters with 9 volt alkaline batteries that expire annually. The battery type varies by vendor, but these were identified as common types by vendors: Ni-MH rechargeable battery pack, 12V DC 27 AH batteries, and 12V/54Ah battery. Because the batteries are sealed lead acid batteries, they can be recycled once the life of the battery has expired.

Real-Time Maintenance Status Capability

Many new parking meter technologies provide the ability to provide real-time maintenance status updates, either at the meter or in the parking management center. This provides a more functional maintenance program, as parking operators can react to problems as they occur, rather than when a patron discovers the problem and phones it in. There are several forms that the vendor can provide this information to the operator or client, including:

- Text and email to operators
- Management system reports
- Alarms sent to cell phone accounts, emails, or via a web portal
- A query of individual meters to determine maintenance, collections, and operation needs

- Most of this information can be accessed via the back-office software management provided by the vendor

Parking Space Detection (Sensors) and Monitoring

The use of parking space detection devices is a rather new technology that provides enhanced management and operations capabilities. These devices allow the parking operator, through wireless communications, to know when a vehicle is parked in an on-street space. This allows for better understanding and maintenance of occupancy data, more efficient enforcement, and better management of the entire system.

There are generally three types of vehicle detection devices. The first is an "above pavement" sensor that resembles a retro reflective pavement marking. This sensor is essentially glued to the pavement. The second type is "in pavement", and is often referred to as a puck because of its resemblance to a hockey puck. These devices are placed into the pavement, via a cored out section of asphalt, and when inserted, are flush with the pavement. The third type is a device that can be mounted securely to the meter pole.

All three devices provide real-time information back to the parking management center, including whether a space is occupied and whether or not the motorist has paid for their parking space. The enforcement benefits are numerous, as the officers no longer have to "chalk" tires and can actually be deployed to violations based on data provided from the devices. The devices can also be used to reset or "zero out" meters that are vacant, removing the "found time" occurrence where a motorist drives up to a paid meter.

One of the more recent uses of these devices has been patron wayfinding to on-street spaces, through the use of Smart Phone applications. The sensors can identify when a spot is empty, update an online inventory, and then push the information out through the application. This provides for less time circling for parking, as motorists can actually make an open space their end trip destination. Once at the space, the motorist then has the ability to pay for the space through the smart phone application.

Additional networking hardware is not necessary for any of these devices. Inside the sensors are electronics powered by an internal battery that can detect a vehicle parked in a space. All three devices can be integrated with other parking equipment (digital parking meters, mobile handheld devices, and ticket and payment technology) to monitor near real-time occupancy status, equipment status, violation status, and collection status. The sensors communicate to a central server over a wireless short-range radio network and cell phone-based internet connection.

<u>Benefits of Parking Space Detection</u>

1. The sensors can be integrated with other parking technologies (single-space and multi-space parking meters, handheld enforcement devices, central information servers).

2. Parking managers have the option to adjust parking rates based on demand. Where parking demand is higher and/or at higher demand times, the parking rates can be increased. Conversely, where parking demand is less, the rates can be lowered.
3. The sensors can enforce the parking meter time limit, which improves efficiency in enforcement by providing violation data to handheld devices used by enforcement officers.
4. Since the devices collect real-time occupancy status, that information can be relayed from the server to wayfinding signs or smart phone applications (discussed in greater detail in the next section) to provide motorists with the location of available parking spaces, number of available spaces, rates, and time limits. This reduces the time it takes motorists to find parking and relieves aggravation associated with finding an open parking space.
5. The devices can reset or "zero out" meters that are vacant, removing the "found time" occurrence where a motorist drives up to a paid meter.
6. Occupancy data can be generated for statistical analysis projects for a given area. This data could be useful in determining actual number of vehicles that occupied a given space for a determined amount of time (i.e. a 24-hour period). The data could also aid in determining the amount of revenue collected for the space, and how much potential revenue could have been generated for that particular space, in the determined amount of time.
7. Systems typically offer "pay-by-cell phone" as a payment option.
8. For a parking manager, these devices provide additional data that helps to understand the actual use of their parking system. This data can be used to inform policy decisions like parking rates and time restrictions. It can also be used to inform infrastructure decisions, as higher occupancy areas can be identified for additional parking capacity.

Disadvantages of Parking Space Detection

1. One of the values of the sensors, for the parking managers and motorists, is the reliability of the real-time occupancy status. The system is technologically advanced and communicates with other parking devices; therefore it must be monitored frequently to identify any glitches or failings in the relaying of information. False information can result in missing a vehicle that is illegally parking or a wrongful citation of a vehicle that is legally parked. Both of which are costly for the city.
2. The sensors have to be configured to block out "interferences" such as other cell phone traffic, underground cables, and overhead wires. This can be achieved with noise cancelling filters.

Real-time Parking Management Applications

The next generation of parking management is in the form of applications that can be accessed through the internet, smart phones, and navigation systems. Parking applications communicate with parking management servers, and link parking managers and the public to the data collected by the parking meters (multi-space and single-space meters).

The data is collected from partners at parking lots and garages, and distributed in the application. The technology is starting to offer this same service for on-street parking spaces. However, this data is reliant on cities installing vehicle detection sensors that relay near real-time parking occupancy for each space to a centralized server. The application can access the data on the server and make it available on the web, smart phones, and navigation systems. The application uses a Google maps interface to display the parking information.

Benefits of Real-time Parking Management

1. Users can view percentage of occupancy, view rates, identify parking restrictions, locate entrances to the garages or lots, make payments to the meter by cell phone, and to reserve a parking spot by paying in advance at participating garages all before they get in their vehicle. One application, soon to be rolled out in San Francisco, has the ability to warn drivers not to use the application when it is being used while driving faster than 10 miles per hour. This is to remind drivers that it is unsafe to use a cell phone while driving.
2. Allows parking managers to identify and track areas with higher parking demands and can then make improvements to the parking system based on that information.
3. Provides users with flexible payment options, such as pay-by-cell phone, and the ability to reserve parking spaces in advance, at participating locations.
4. The applications are typically free and require no software or network installations.

Disadvantages

1. The applications are reliant on available parking data collection technologies and therefore only provide information for parking lots and garages for the time being. As cities install new parking technologies that have the ability to monitor and track on-street parking occupancy in near real-time, the application will be expanded to include on-street parking occupancy as well.
2. As with other applications (i.e. traffic applications) the parking application is near real-time, meaning that parking rates and occupancies may change before they can be updated in the system. This can frustrate some drivers and give those drivers the perception that the application is unreliable.

Electric Vehicle Charging Stations

In recent years, the United States has seen an increase in the number of electric cars. In fact, President Obama announced in January 2011 a challenge to place one million electronic vehicles on the road by 2015. As the market of electronic vehicles grows, parking facilities must grow along with it to accommodate such vehicles. A number of cities across the U.S. have implemented electronic vehicle charging stations in garages, residential areas, and metered on-street parking spaces. Charging stations are similar in appearance to pay stations, except they have a cord that attaches to an electric vehicle. The stations accept credit cards and can charge two vehicles at once typically at 240V/30A (3-4 hours to fully charge a car). The cost to charge ranges depending on the city, vehicle type, length of charge, and price of electricity. Some stations are solar powered or they can draw electricity from the pay station or meter. Appropriate signage, similar to that on a pay station, should be present on a charging station to indicate payment and charging instructions, time limits, and rates. Similar to pay stations, charging stations are capable of communicating maintenance and other critical information.

Wayfinding Technology

Wayfinding technology for parking is used to direct drivers to available parking areas. The purpose of using wayfinding is to reduce vehicle miles traveled and congestion by limiting the amount of time it takes for drivers to find available parking. Wayfinding can be static or dynamic. Static wayfinding signs are positioned to direct drivers to parking areas, but do not provide further information, such as availability. Dynamic wayfinding signage uses electric messages to provide real-time parking availability as well as the location of parking. In areas with special events, the dynamic wayfinding signs are flexible and can accommodate changes in parking rates and times on those event days.

Off-street parking can utilize both static and dynamic wayfinding systems. Theses signage systems prove beneficial to off-street parking locations, because they are confined to single locations with large capacities of parking that are ideal for directing large amounts of traffic to. Additionally, it is easier to use parking space detection sensors in off-street garages and lots to monitor availability in real-time. These sensors can relay the availability information to the dynamic wayfinding system to show real-time availability for that garage or lot.

Using wayfinding technology for on-street parking is more challenging. On-street parking spaces are spread out, making it difficult to direct drivers to specific locations. The signage required to direct motorists to available parking would number in the hundreds or thousands and would create an especially clustered look in the downtown area. At this point, there are no known communities that have used dynamic wayfinding signage to provide navigation to on-street parking. The closest possible alternative is the use of GPS or smart phone applications to direct drivers on an individual basis. However, the use of on-street parking space detection sensors has yet to be thoroughly tested and proven to be effective and cost efficient.

PCI Compliance & Certification

A critical consideration in implementing multi-space meters or credit card capable single-space meters, is the need to provide data security related to credit card data. The purpose of this section of the report is to provide an overview of the Payment Card Industry (PCI) standard for ensuring credit card security. This is not an exhaustive treatise on PCI and all of the ramifications of PCI certification. However, it is important to note that under no circumstances should you, the parking system or your contracted private parking management firm, allow the operation of equipment under your control that is not PCI certified. It should also be noted that PCI certification requires verification; that is, if a vendor shows you a certificate of PCI certification you need to obtain independent verification that the certificate is valid.

PCI certification is ever evolving and will change each year – it should be noted that all vendors who are currently certified PCI compliant will have to renew their certificates. It should be a requirement that these updates be part of your standard operating procedures to minimize your liability.

PCI compliance is a complex subject affecting millions of businesses – including banks, Independent Sales Organizations (ISOs), processors, hosts, e-commerce and retail merchants and other merchant services providers.

PCI compliance is critical in terms of protecting consumers from identity theft. The Identity Theft Resource Center, a non-profit organization located in San Diego, is committed to helping victims of identity theft and to protect others from the crime. According to two studies done in July 2003 (Gartner Research and Harris Interactive), approximately 7 million people became victims of identity theft in the prior 12 months. That equals 19,178 per day or 799 per hour or 13.3 per minute. Today, the number of identity theft victims is much larger - it has increased to more than 10 million people per year. What is even more shocking is that, in 2005, at least 152 data disclosure incidents were disclosed, potentially affecting more than 57.7 million individuals.

Getting Ready for EMV

The purpose of this section is to provide an overview of the EMV1 specifications and processes. The document is intended to describe the "what" and the "why" of EMV within the context of the wider payments industry. The EMV Integrated Circuit Card Specifications for Payment Systems are global payment industry specifications that describe the requirements for interoperability between chip-based consumer payment applications and acceptance terminals to enable payment. The specifications are managed by the organization EMVCo and are expected to be rolled out in the US sometime around October of 2015. This information is being provided here because any agency looking to upgrade their technology that will utilize credit card payments, should be planning to incorporate these new payment card specifications and processing into their new system requirements.

Named after the original organization's that created the specification, Europay, MasterCard and Visa, the EMV specifications were first published in 1996. Fourteen years later, there are now one billion active EMV chip cards used for credit and debit payment, at 15.4 million EMV acceptance terminals deployed around the world.

The distinguishing feature of EMV is that the consumer payment application is resident in a secure chip that is embedded in a plastic payment card, often referred to as a chip card or smart card, or in a personal device such as a mobile phone. The chip provides three key elements - it can store information; it can perform processing; and because it is a secure element, it is able to store secret information securely, and perform cryptographic processing. These capabilities provide the means for secure consumer payments.

In order to execute a payment, the chip must connect to a chip reader in an acceptance terminal. There are two possible means by which this physical connection may be made which are often referred to as contact or contactless. With contact, the chip must come into physical contact with the chip reader for the payment transaction to occur. With contactless, the chip must come within sufficient proximity of the reader, (a maximum of 4cm), for information to flow between the chip and the acceptance terminal. In both scenarios, the acceptance terminal provides power to the chip to enable the chip to process.

Chips that are embedded in form factors such as plastic payment cards may support only a contact interface, only a contactless interface, or both contact and contactless. Chip cards that support both contact and contactless interfaces are referred to as dual interface. When the chip is installed inside a non-card form factor, such as a mobile phone, contactless is typically the only option for connection to the acceptance terminal.

<u>Why EMV</u>

EMV is designed to significantly improve the security for consumer card payments by providing enabling features for reducing fraudulent payment that results from counterfeit and lost and stolen cards.

The features that are defined by EMV are as follows:

1. Authentication of the chip card to verify that the card is genuine so as to protect against counterfeit fraud for both online authorized transactions and offline transactions.

2. Risk management parameters to define the conditions under which the issuer will permit the chip card to be used and force transactions online for authorization under certain conditions such as offline limits being exceeded.

3. Digitally signing payment data for transaction integrity.

4. More robust cardholder verification to protect against lost and stolen card fraud for EMV transactions.

Counterfeit and lost and stolen card fraud represents significant cost to all participants in the payment process, including retailers, acquiring banks, card issuers and cardholders. Costs are realized through the processing of cardholder disputes, research into suspect transactions, replacement of cards that have been counterfeited or reported as lost and stolen, and eventual liability for the fraudulent payment itself. By reducing counterfeit and lost and stolen card fraud, EMV offers real benefits to retailers, acquirers, card issuers and cardholders.

For more information, the following references are provided:

1. The EMVCo web site www.emvco.com
2. EMV Integrated Circuit Card Specifications for Payment Systems, version 4.2, June 2008 (EMVCo LLC)
3. EMV Contactless Payment Specification For Payment Systems, version 2.1, September 2010 (EMVCo LLC)
4. Type Approval Process Documentation for terminals and cards available from EMVCo LLC.

EMV Security Guidelines, version 4.0, December 2010 (EMVCo LLC)

Wireless Communications

Practically all new parking meters use wireless communications to transmit data between the parking meters and the parking management center. Wireless parking meters offer many advantages over hard-wired meters, such as lower installation costs and more flexibility in the placement of the meters. Wireless communications also allow for remote monitoring of the parking meters and for real-time encrypted credit card transactions that meet PCI security standards – functionalities not possible in stand-alone parking meters. There are two primary wireless communications technology options for parking meters: cell phone technology and Wi-Fi broadband technology.

In parking meters using cell phone technology for wireless communications, the source modem inside the parking meter transmits data to a nearby cell phone tower, which then relays that data to a destination modem at the parking management center via other cell phone towers. Data can be transmitted through buildings and trees over relatively long distances between the modems and towers. Existing third-party cell phone carrier networks and towers need to be in place in order for communication to be possible between the parking meter and the parking management center. These third-party cell phone carriers (e.g., Verizon and AT&T Wireless) assess monthly fees of $3-$20/month/meter for the “airtime” used by the parking meter wireless communications. Most existing parking meters utilize cell phone technology for wireless communications because of the low initial cost and the ease of installation and maintenance of the communications network.

In parking meters using Wi-Fi broadband technology for wireless communications, the source modem inside the parking meter transmits data to a nearby router, which then relays that data to a destination modem at the parking management center via other routers and gateways. Gateways are the transition point where wireless communications are converted to wire communications (e.g., a fiber optic cable). Data can be transmitted through buildings and trees over relatively short distances between the modems and routers. Routers need a clear line of sight to be able to transmit long distances.

While both methods of communications are technically feasible, the city should be careful when making a selection to choose one alternative over the other. By utilizing the city’s Wi-Fi network, a city may be placing unnecessary risk on its system by assuming PCI compliance responsibility.

Part II: Field Assessment

1.0 Accredited Criteria		On-Street	Off-Street - Surface	Off Street - Structured	Points	EVIDENCE
1.1	Approach, internal, and guidance signage is clear, concise, and appears to be clean and well-maintained.	yes/no	yes/no	yes/no	1	
1.2	Signage shows posted hours of operation and rates.	yes/no	yes/no	yes/no	1	
1.3	There are no unnecessary, out of date, overly redundant signs.	yes/no	yes/no	yes/no	1	
1.4	Compliance and information signs are visisble to drivers.	yes/no	yes/no	yes/no	1	
1.5	Reserved or special needs signs are appropriately placed for the reserved group or individual serviced.	yes/no	yes/no	yes/no	1	
1.6	Compliance and information signs use international symbols.	yes/no	yes/no	yes/no	1	
1.7	Wayfinding, identification and regulatory signage and associated systems are current, clear, concise, and clean.	n/a	yes/no	yes/no	1	
1.8	Signs are designed with highly-contrasting elements (dark background with light graphics or vice versa).	yes/no	yes/no	yes/no	1	
1.9	Deck level guidance information is available.	n/a	n/a	yes/no	1	
1.10	Pay by cell signs or labels are present and visible to patrons.	yes/no	yes/no	yes/no	1	
1.11	Area is free of dangerous conditions, i.e., materials, activities, construction, and refuse.	n/a	yes/no	yes/no	1	
1.12	Emergency and communications services are marked and functional, lights and systems functioning.	n/a	yes/no	yes/no	1	
1.13	Areas accessible to the public are open and visible, and devices are placed so to minimize dark or non-visible areas.	n/a	yes/no	yes/no	1	
1.14	Sight lines are clear to exits.	n/a	yes/no	yes/no	1	
1.15	Lights make use of bright, white light.	n/a	yes/no	yes/no	1	
1.16	Lighting is intact, lights are active, and there are no dark areas.	n/a	yes/no	yes/no	1	
1.17	Lighting, fixtures and machine surface fixtures or interfaces are shatter proof and/or protected.	n/a	yes/no	yes/no	1	
1.18	Entry/Exit plazas, drive aisles, parking bays and drive aisles are evenly illuminated (no dark areas).	n/a	yes/no	yes/no	1	
1.19	Lighting spill over is mitigated.	n/a	yes/no	yes/no	1	
1.20	Parking surfaces and pedestrian areas are clean and free of road grit, water, refuse, and non-vehicle items or storage.	n/a	n/a	yes/no	1	
1.21	Asphalt and concrete surfaces are free of chips, potholes, cracks or slab heaves and trip edges.	n/a	yes/no	yes/no	1	
1.22	Curbs and stall demarcations are visible to the parker.	n/a	yes/no	yes/no	1	

1.23	Parking and pedestrian areas are free from snow/ice/water and other obstructions.	n/a	yes/no	yes/no	1	
1.24	Sign posts are straight and appropriately placed.	yes/no	yes/no	yes/no	1	
1.25	Landscaped edges, boulevards, grassy areas are well maintained.	n/a	yes/no	yes/no	1	
1.26	Layout and perimeter edge treatments allow easy pedestrian access and egress.	n/a	yes/no	yes/no	1	
1.27	Overhead railings, pipes, conduits, and other level surfaces are free from dust, dirt, soot, bird droppings, or other substances.	n/a	n/a	yes/no	1	
1.28	Concrete spalls or delaminations have been repaired and patched.	n/a	n/a	yes/no	1	
1.29	Surfaces are free from salt and water stains.	n/a	n/a	yes/no	1	
1.30	Membranes are intact and complete.	n/a	n/a	yes/no	1	
1.31	Expansion joints are secure.	n/a	n/a	yes/no	1	
1.32	Decks are not leaking.	n/a	n/a	yes/no	1	
1.33	Heating or climate control processes, if fitted, are functioning and in place.	n/a	n/a	yes/no	1	
1.34	Outside pedestrian doors are glazed (has glass panes or panels for visibility).	n/a	n/a	yes/no	1	
1.35	Field test of payment system functions properly.	yes/no	yes/no	yes/no	1	
1.36	Where cash change is available, correct change is returned.	yes/no	yes/no	yes/no	1	
1.37	Machine issues receipts that include the name of the parking vendor, date time limits and fees associated with the purchase.	yes/no	yes/no	yes/no	1	
1.38	Information on what to do if the machine is out of service is clearly communicated.	yes/no	yes/no	yes/no	1	
1.39	Field transactions have credit card or other remote payment capability.	yes/no	yes/no	yes/no	1	
1.40	Field booth facilities are neatly maintained and painted.	n/a	yes/no	yes/no	1	
1.41	Where a PARCS is used, machines are operational, tidy and in good order.	n/a	yes/no	yes/no	1	
1.42	Where a PARCS or metering is used, there are additional machines for redundancy (in case one goes off line).	n/a	yes/no	yes/no	1	
1.43	Speed control devices, if fitted, are functional and effective.	n/a	yes/no	yes/no	1	
TOTAL STANDARD SCORE					**43**	

Appendix 7B

Accredited Parking Organization Program Manual

ACCREDITED PARKING ORGANIZATION

ACCREDITED PARKING ORGANIZATION℠ PROGRAM

MANUAL FOR APPLICANTS

Second Edition, May 2016

IPI INTERNATIONAL PARKING INSTITUTE℠

Advancing the parking profession℠

ACCREDITED PARKING ORGANIZATION PROGRAM

MANUAL FOR APPLICANTS

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INTRODUCTION

Welcome to the Accredited Parking Organization (APO) Program, IPI's newest credential, which establishes a benchmark of the quality by which a parking management organization conducts its business and maintains its facilities and services. An APO designation assures the public that a parking program meets national and internationally endorsed standards for professionalism, accountability, creativity, responsibility, and performance.

The parking industry's sectors include institutions, colleges, and universities; health services and medical centers; airports and intermodal transport hubs; municipalities; and office buildings, shopping centers, and other private facilities. All large and small, full- and partial-service organizations will share a single accreditation format that recognizes areas of advanced and exemplary services and innovations, as well as entrepreneurial spirit.

One of the goals of accreditation is to inspire organizations to improve their programs, facilities, services, and results continuously. By undertaking this process, your organization demonstrates its commitment to ongoing evaluation and improvement of program outcomes through the implementation of industry best practices.

Why Your Organization Should Become an APO

Until now, there has been no centralized accreditation or quality measurement system for parking organizations; rather, parking organizations have created and maintained their own standards and promoted them as good and effective—rather than "industry best"— practices. While this has been successful in gaining some recognition for individual programs, it has not encouraged the emergence of a unified brand or concept of a parking product that has positive effects in the minds and imaginations of customers and stakeholders.

The process of becoming an APO engages managers and staff in research and strong progress toward learning and adopting industry best practices and focuses organizations on the continuous improvement of internal efficiency and profitability.

It also promotes continuous development and improvement of industry products and services in a manner that is generally recognized by industry peers, internal and external administrators, and the general public. This will result in improved facilities and services as well as improved utilization and revenues.

Becoming an APO

1. Understanding APO Standards and Best Practices

Accreditation is the final act for a program that compares and measures existing practices against objective standards, resulting in a measured validation that certifies competency, authority, and/or credibility.

Standards are formal documents that establish uniform criteria, methods, processes, and practices related to a given activity or industry. Primary standards define the key characteristics of an individual item or practice and are supported by a hierarchy of secondary, tertiary, and check standards. A custom, convention, or corporate practice that becomes generally accepted and dominant is often referred to as a de facto standard.

Jeremy Brooks

Standards may be developed privately or unilaterally by a corporation, trade or occupational group, regulatory body, military, or other authoritative source. They may be developed by edict or a formal consensus of technical experts and usually are retained in the custody of a national or international standards body created expressly for that purpose.

International standards are directly imposed by an authoritative international governing body and sometimes are modified to suit local conditions; equivalent, national standards may differ somewhat in appearance, use of language, and definitions. They may reflect conflicts in governmental regulations or industry-specific requirements caused by geographical, technological, or

infrastructural factors, or the stringency of a given authority. International standards represent one method of overcoming barriers in international commerce caused by differences among nations or economic regions.

Best practices are methods or techniques that yield consistently superior results in public policy and business management activities. Used in nearly every industry and professional discipline, they serve as benchmarks of standardized ways of doing things that continue to evolve as improvements are discovered. Best practices often are used as an alternative to mandatory legislated standards and can be based on self-assessment, peer assessment, or formal benchmarking. Prior to becoming a "best" practice, a particular activity might be described as a smart, good, or promising practice. These best practices are the backbone of formal accreditation programs.

2. Why Standards Are Important

Standards form the fundamental building blocks for product and service development by establishing consistent practices and protocols that can be universally understood and adopted. This helps fuel compatibility and interoperability between products and services; in manufacturing, they simplify product development and speed time-to-market; in service industries, they simplify delivery techniques and form consumer expectations. Standards make it easier to understand and compare competing services. They propel the development and implementation of the products, services, technologies, and economics that influence and transform the way we live, work, and communicate.

At a consumer level, standards provide a safety net for many areas of our individual experience. They remove consumer anxiety by informing us about the reliability and fitness of the goods and services we buy and use, offer us greater choice, and instill confidence in the businesses we patronize. At a service-supplier level, standards provide clear guidelines toward targets that reflect best practices and offer protection from lesser rivals who might otherwise damage an industry's reputation. They provide an excellent selling point and a benchmark that can be used for communicating the specification and characteristics of a product, service, or system. They help explain improvements and innovations, and offer a competitive advantage by making it easier, cheaper, and more efficient to produce and sell industry products and services, both locally and internationally.

A good example of the power of standardization is the Global System for Mobile Communications (GSM) mobile communication technology network and its successors (3G, 4G, etc.). Although GSM originated in Europe, the technology has been adopted worldwide, helping travelers to communicate about and use familiar services globally.

While modern society views standardization as a given in technological fields, consumers and service providers are less accustomed to applying standards to everyday services. The parking industry has matured rapidly and possesses an entrepreneurial spirit. While these characteristics lend great vitality and value to the industry, the absence of generally accepted standards creates a gap between what customers expect and what the industry can deliver. By establishing standards for facilities and service delivery, we create a level playing field for the industry that assures customers and stakeholders of the highest quality.

3. What the APO Standard Represents

The APO standard for parking facilities and services represents the industry's best efforts to collect, assemble, and develop a reputation for achieving higher levels of quality and professionalism. It verifies that the accredited organization has achieved an established level of organization, delivery, and performance best practices within the top 30 percent of the global parking industry. Accreditation with Distinction indicates that the organization has achieved standing in the top 5 percent of the global industry.

The APO program is intended to be both a visionary, guiding standard and a day-to-day performance standard that is achievable by all industry organizations. Based on the scope and scale of individual organizations operating in different environment and service sectors, the program reinforces the industry training and professional certification initiatives developed by IPI and available to the industry worldwide.

The APO designation is awarded at the Accredited or Accredited with Distinction level. For the APO program launch in 2015, organizations were eligible to submit for the Accredited level. Those organizations were then eligible to submit for the Accredited with Distinction level after January 1, 2016. As of January 1, 2016, organizations may apply for either APO or APO with Distinction. Those organizations that wish to pursue APO, and then APO with distinction at a later date, will be permitted to do so through a new application. This manual is constructed to include both levels to educate and inform organizations that wish to pursue the accreditation.

Applicant organizations will be asked to gather and transmit information as objective evidence of attainment of the accreditation standard they are seeking, and to work with a third-party site reviewer to organize and present evidence that demonstrates accomplishment of each required item. A series of nominal fees will apply to process the application and sustain the program. The reviewer will visit the applicant site and work through the evidence to determine suitability, and whether the evidence item is material (applicable or not applicable) to the application. Based on the reviewer's recommendation, IPI, through its APO governance process, may award the APO designation at the appropriate level.

The APO program is designed to evolve and become more demanding over time, in accordance with industry practices. It will continue to "raise the bar", facilitating and encouraging continuous improvement in the industry.

4. The APO Board

The APO standard is trademarked (international) and is the intellectual property of IPI. The IPI Board of Directors has established the APO Board to provide oversight and strategic direction for the APO program. The APO Board ensures and supports the development and maintenance of industry standards representing the highest level of professionalism and competency. The Board is responsible for maintaining a benchmark of excellence for the industry and provides a means for parking and transportation organizations to demonstrate their proficiency and competency and be recognized by their peers, employees, employers, regulatory agencies, customers, and the public.

The accreditation standard will be amended and updated every three years, or as may be required by the ongoing evolution of the industry. Amendments or change to the standard will be made at the sole discretion of IPI and its governing bodies.

5. Eligible Organizations, Definitions, and Summary of Criteria

Eligible Organizations

Parking Organization – A parking organization is an entity that operates, manages, owns or leases parking facilities (defined as: parking lot(s), garage(s), ramps, carparks, etc. and on-street parking spaces).

> *Example: ABC airport has parking that is close to the airport and also runs multiple airports within the state. Application Fee ($250); Accreditation Fee ($2,500).*

Multi-Site Parking Organization – A parking organization may operate, manage, own or lease parking sites that are not in close physical proximity. Despite geographic distance, sites are managed with common policies and procedures by the same parking organization. In this case, they may be included in the same APO application.

> *Example: ACME University operates, manages, owns or leases parking facilities that are not in close proximity, for instance in separate cities. Application Fee ($250); Accreditation Fee ($3,500, including first three facilities) plus $500 per additional facility.*

Criteria for APO

- Meets 100% of the *required* criteria in Section 1 of the APO Matrix.
- Meets 80% of the remaining criteria in Section 1 of the APO Matrix.
- Has at least one facility meet 80% of criteria in Section 2 of the APO Matrix (Onsite Review as part of Site Visit). May submit up to three facilities as part of documentation; additional facilities may be added per the fee schedule.
- Payment of Accreditation fees, including $250 application fee, and $2,500 for three year accreditation period. Additional facilities (in addition to the first three) are $500 per facility. *These are IPI member rates, additional fees apply for non-members.*
- Complete facility review documented by IPI-approved APO Site Reviewer. *Fees negotiated separately between applicant and site reviewer.*
- Once all of the above criteria have been met and the APO Board has formally granted APO status, applicant will be notified of the successful APO pursuit, and may use the APO logo.

ACCREDITED PARKING 2016-19 ORGANIZATION

Criteria for APO with Distinction

- Meets all of the criteria for APO as detailed above.
- In addition, meets 80% of the APO *with Distinction* criteria in Section 1 of the APO Matrix.
- Once APO and APO with Distinction criteria have been met and the APO Board has formally granted APO with Distinction status, applicant will be notified of the successful APO pursuit, and may use the APO with Distinction logo.

Length of Accreditation

The initial accreditation term is valid for three years. The re-accreditation term is valid for one, three-year term, and APOs will be provided with a streamlined application process for recertification. Upon completion of the streamlined re-accreditation application, payment of $1,500 fee, and formal approval, the applicant's APO status will be extended for the three-year period.

After six years, a new application (based on the subsequent editions of the APO Manual for Applicants and APO Matrix) needs to be submitted with current applicable fees.


@first_sight

Additional Facilities

Should an APO organization wish to add facilities during either their initial three-year certification term, or recertification three-year term, they may do so by having those facilities undergo a facility review, meet the accreditation criteria, and pay $500 per facility. Regardless of when additional sites are submitted, the initial (or recertification) accreditation term stands for the APO and any related facilities.

> *Example: XZY municipality earned the APO in 2016. Their initial accreditation term is through Dec. 31, 2019. In 2017 they want to add two additional facilities. Adding the additional two facilities in 2017 does not extend their initial accreditation term to 2020; it remains Dec. 31, 2019.*

APO Premier Facility

As an additional benefit, facilities meeting the accreditation criteria under Section II of the APO Matrix and formally recognized by the APO Board may display the APO Premier Facility logo on their website and at each facility having undergone the facility review and meeting the accreditation criteria.

> *Note: Even though a parking organization may successfully achieve APO status, parking facilities that are not inspected nor evaluated against the APO Section 2 requirements as part of the APO application, or fail to meet the APO criteria, may not be marked as a Premier Facility. Marking or branding a facility as a Premier Facility, or as an APO site, without meeting these requirements may result in the parking organization losing its APO status.*

6. Getting Ready for Accreditation

An organization is ready for accreditation when it has adopted applicable recognized best practices and gathered evidence to demonstrate and benchmark these practices. Several industry publications and resources are available to assist potential applicants in preparing for the accreditation matrix, including but not limited to:

- *Parking 101: Parking Primer, Volume 1*, International Parking Institute
- *Parking 101: Parking Management: The Next Level, Volume 2*, International Parking Institute
- *Parking 101: Parking Management: Planning, Design and Operations, Volume 3*, International Parking Institute

- *What's What in Parking Technology, Second Edition*, International Parking Institute
- *Sustainable Parking Design & Management: A Practitioner's Handbook*, International Parking Institute
- *The Parking Professional* magazine
- CAPP Resource Guide
- www.parking.org

7. The Matrix

IPI freely distributes copies of the current APO matrix to guide applicants. To help applicants prepare for the process, the APO matrix is provided to applicants and online at parking.org/apo. Applicants are encouraged to share the matrix with other organizations interested in becoming accredited. It is divided into sections which can be delegated to a management team tasked with assembling the evidence, and then reassembled for inspection and reporting. During evidence preparation, the evidence-collection team corresponds with their selected reviewer to determine what evidence is required and which may not be applicable to their particular program. The reviewer will collect formal and informal evidence and make a complete copy for the applicant following the site review and before submitting evidence and recommendations to the APO governing authority.

8. The Role of the Reviewer

Each applicant will be required to seek a qualified, authorized, site reviewer to confirm their facts and specifics of their application and provide a report to the APO Board supporting their request for accreditation.

Review services, available from IPI-approved providers, include, site reviews- and accreditation recommendations. Most review service providers retain a number of trained and certified reviewers to assist organizations in pursuit of accreditation. In preparation for their review, organizations are encouraged to contact a reviewer to initiate a services agreement with one of these groups. IPI will provide current contact information regarding skilled and trained individuals at parking.org/APO.

In consultation with a reviewer, each organization will be guided in assembling the required evidence necessary to achieve the desired level of accreditation. Evidence may be gathered and transmitted to the reviewer in a variety of ways; however, electronic copies of all evidence documents must be sent to APO via an electronic file retention or transfer process before any accreditation recommendation can be made.

When all evidence is gathered remotely, the reviewer will visit the sites and programs to verify the evidence's accuracy and completeness independently, and will identify the correct level of achievement. All completed evidence collections, site-visit attestations, reports, and electronic images must be submitted by electronic means to the APO Board for affirmation and granting the APO. These electronic records will be securely maintained for documentation purposes, but will remain confidential and will not be disclosed to any person or organization other than the applicant, APO Board, or IPI staff. The reviewer's organization will charge a fee paid directly to the reviewing organization, to be negotiated under separate contract between the applicant and reviewing organization.

Every country, state, or region, parking facilities require a qualified, trained, and objective third-party visual assessment of their facilities and services to verify achievement of the accreditation standard. The desire to keep costs as low as possible and integrate the accreditation standard into efficient local practices necessitates that site review services be available locally. IPI has developed specialized training for local and national firms to deliver review services within a reasonable distance of most urban centers, allowing applicants to source their reviewer close to home.

All reviewers are trained and granted qualification by IPI based on their performance in APO training seminars and examinations that focus on accreditation best practices. Companies offering review services can be contracted for services leading up to and including the final APO site-visit review. Consultant or other IPI member organizations may offer review services as part of their own regular service packages, at rates they determine, provided that all reviewers are trained and approved by the APO Board and all reviewer quality practices are observed. Conflicts of interest that are not permitted include current employment and family relationships with the leadership team of the applicant organization. If an applicant organization wishes to pursue the APO designation, an objective third-party reviewer must be selected.

Reviewers hold their certification at the discretion of the APO Board, and those who provide questionable or substandard services in any aspect of their duties may have their approval revoked at any point. APO designations based on questionable review practices may be re-opened and re-examined subsequent to any withdrawal of reviewer certification.

9. Demonstrating Accomplishment of Best Practices

Organizations will be asked to gather, transmit, and retain objective and documentary evidence to support all of their claimed accomplishments. It is understood that different organizations may use different documentation methodologies, and that some of the evidence may be non-specific or visual in nature. If evidence is non- specific and/or submitted as an equivalent substitute for the documents, the equivalent must be demonstrated to the satisfaction of the reviewer and, ultimately, the IPI APO Board. All supporting evidence must be retained and transmitted to IPI by an approved site reviewer for custodianship prior being accepted. A detailed description of the evidence required by the APO Board follows.

Once IPI has reviewed all materials, IPI may grant accreditation. An organization is considered accredited when it receives the affirmation letter and certificate from IPI, accompanied by award displays, permissions, and instructions for communications with the public. The accreditation is conferred by IPI and may be upgraded or revoked at IPI's sole discretion at any time for any cause, including a shortfall in new achievements or performance.

10. Scope and Scale of the Organization

The APO Matrix assumes a complete and full-service organization that performs in all areas of parking management. If an applicant does not participate in some areas of parking management (i.e., operating parking garages), the applicant should identify that item or section as "not applicable" and mention this to the reviewer for consideration. Affirmation that the item is not applicable by the reviewer and the APO Board will exclude it from the score and nullify any negative effect.

Applicants are encouraged to use the checklist to implement change in their organizations. When applicants approach completing the matrix, they should contact their reviewer to examine any areas of real or suspected non- applicability or non-compliance. It is recommended that applicants do not schedule a reviewer visit until all required items are addressed and all evidence is gathered and verified to be correct and complete via the preliminary telephone meeting process.

11. Criteria and Documentation

This document identifies more than 150 industry best practices and program features that are present in modern institutional, municipal, medical, university, airport, private, and other parking programs around the world.

IPI recognizes that the parking industry is broad and entrepreneurial in scope and scale, and diverse in the way it approaches daily management challenges; what is a natural administrative solution for one program is often impossible for others. Accreditation seeks to define a common theme by emphasizing what is accomplished, rather than prescribing how it should be done.

To satisfy each item, the applicant is required to present clear, objective, and documented evidence that speaks directly to their claim. As an example, if the accreditation matrix requires a mission statement containing references to financial clarity and customer service, the applicant may submit a notarized or authorized current statement satisfying these requirements. This may be presented to the reviewer and APO Board in the form of an operating charter, internal planning document, internal communication document or email, published website, or other definitive public communication.

Other acceptable formats for communication of standards include:

- Internal documents, letters, emails, manuals, internal descriptions, or statements of objectives and standards of service delivery.
- Diagrams, illustrations, organization charts, flow charts, photographs, or other graphically definitive presentations.
- External third-party audits or opinions, "out of department" reports, letters or emails, web pages, or other objective electronic or hard-copy documents that describe a task or a function and demonstrate that the principle and function requested in the matrix is regularly occurring in the parking organizational unit.

Where varying evidence formats are presented, the reviewer will advise regarding the acceptability of the evidence provided.

12. Accreditation

There are 25 elements in the Standard that are required. All organizations seeking the APO designation must achieve 100 percent of these items.

Organizations must accomplish 80 percent of the 131 individual criteria to earn the APO designation. Accreditation at this level signifies that the organization has developed a solid and well-rounded parking program that exhibits all of the key practices in use in the global industry, and falls within the top 30 percent of all operating organizations.

It is important to note that the parking facilities and services industry evolves rapidly, with new program elements being constantly developed. Concepts move on to become advanced practices and, ultimately, "best practices" that empower and enable administration and operations in a variety of environments.

Working with experts in each environment and service sector, IPI has assembled these key elements into an aggregate suite of key attributes or best practices that are followed by progressive and leading service providers worldwide. These practices are considered essential to achieve recognition as a progressive provider, and the standard reflects a requirement of 80 percent compliance to achieve accredited status. This level of achievement identifies a facilities and services program as representing a strong mix of regulatory and business acumen, technological sophistication, service and contribution to the host community, and service to customers and stakeholders, as appropriate to the environment and service sector.

13. Required Criteria

The following elements are marked "Required" on the matrix and must be achieved for an organization to earn accreditation.

1.1 Provides a copy of official documentation that defines a contract, charter, ordinance or enabling legislation.

1.2 Provides documentation showing governance hierarchy (Board of Directors/ Executive Director roles, responsibilities, terms, and relationships) is current; and policy-making authority, process, record-keeping, and decision-making are transparent.

2.1 Provides current documentation stating short- and long-term goals and identifying measurable objectives and timelines for achievement.

2.3 Planning includes an annual or multi-year budget and financial projection, with periodic tracking and analysis, and coordinated with related community or institutional planning entities.

3.1 Mission and Vision or other guiding statements address financial principles, such as transparency, accountability, and responsibility.

3.2 Produces and maintains an annual budget and projects a future (three or more years) financial planning document.

4.1 Commitment to service is identified and detailed in mission and/or vision statements.

4.4 Provides and maintains a proactive customer-service training program for all staff.

5.1 Provides all staff with an employee handbook, or equivalent document(s) identifying roles, tasks, responsibilities, operational policies, and procedures.

5.3 Maintains current job descriptions for each position, and files training documentation for regular staff.

6.1 Maintains effective access and revenue control plan for all facilities and services.

7.1 Demonstrates that regular onsite inspections are an integral part of facility maintenance.

7.7 Performs condition assessments by a qualified structural engineer, who conducts a walk-through inspection (annually).

8.1 Documents current compliance goals designed to encourage voluntary compliance.

8.2 Regulations and processes related to enforcement and appeals are transparent and available to the public.

9.1 Outlines safety and security philosophy in organization objectives and values.

9.3 Maintains SOPs or manuals and conducts testing, drills, and emergency communication procedures (i.e., 911, police, fire, administration, supervision.)

10.1 Demonstrates a strategic commitment to environmental sustainability.

10.2 Demonstrates implementation of sustainable practices showcasing a direct reduction in energy or resource use.

11.1 Demonstrates a commitment to reducing or distributing travel demand.

12.1 Develops and maintains a communications and marketing plan that supports the program's larger strategic goals.

12.3 Annual budget includes dedicated funding for communication and marketing activities.

13.1 Has a defined policy for protecting sensitive data and retaining or destroying secure data.

13.10 All equipment and services purchased are certified as PCI-DSS- or PA-DSS-compliant.

14.1 The applicant maintains active contracts with external service providers.

14. Accreditation with Distinction

Many organizations employ leading and progressive advanced practices and vision and innovation that go beyond the broad acceptance level required for accreditation. IPI seeks to recognize, support, and celebrate these fast-forward concepts with a higher tier of accreditation. To qualify for Accreditation with Distinction, organizations must achieve 80 or more points out of an additional 86 exceptional or advanced practices. Organizations that meet this threshold demonstrate accomplishment in the top five percent of the industry.

As of January 2016, new applicants may choose to submit at the Accredited or Accredited with Distinction level. IPI encourages organizations pursuing accreditation under this program to consider both levels when preparing for review documentation and site visits by the selected site reviewer.

Visionary and innovative programming is being developed on a small scale constantly, so advanced-standard concepts will be updated every three to five years as the industry progresses. Future best practices will be recognized as advanced achievements and may become best practices as they reach broad acceptance. To retain either level of recognition, APO's must advance and maintain standards current in the year of assessment or renewal.

15. When an Organization's Scoring Falls Short

The APO program's goal is for every applicant to attain the standard at the appropriate level. While some organizations may accomplish the APO standard quickly, others may take longer to gain the required experience and evidence. Organizations that have not yet attained the required level of experience and evidence are encouraged to persevere. With effort and commitment, every parking organization can obtain accredited status.

Organizations that do not achieve the necessary performance standards on first assessment will be debriefed by their reviewer on results and shortcomings, and given a list of accomplishments required to achieve accreditation. Based on the scope or scale of the organization being assessed and its location or service sector, some elements of the APO matrix may not be appropriate. In this instance, the reviewer will formally identify these items as not applicable and provide the necessary justification to the APO Board for this request.

16. Appeals

Organizations that do not achieve accreditation and wish to present an objection to IPI may address their concerns to the APO Board. Frivolous or opportunistic appeals will not be considered. Appealing organizations should be prepared to present evidence detailing why their site reviewer's recommendation or IPI's final decision should be re-evaluated. The Board will review the submission and render a final decision or recommendation within 60 days of receipt of the appeal.

Chris Chapman Photography

17. Promoting Your Accreditation

After notification of accreditation, IPI provides a comprehensive package of benefits and support for the organization, to include certificate, plaque, permission to use the APO logo, and branding guidelines. In addition, IPI will provide ongoing support and visibility through its website and multiple platforms. Accredited organizations hold the designation for a three-year period, and for subsequent years following successful renewal. Benefits include, but are not limited to:

- Provision of a branding and identity package, which includes use of the APO logo (dated for the specific years of the accreditation) to display on marketing and business collateral, websites, letterhead, business cards, facility signs, plaques, uniforms, and other visible public areas (samples and electronic formats provided).
- Press release by IPI showcasing the organization's achievement in national media and template for use by the APO to local media.
- Recognition at the annual IPI Conference & Expo, awarding a certificate and plaque showcasing the organization's Accredited status.
- Identification at the appropriate level of accreditation in IPI documents.
- Highlighted status on the IPI website parking.org.
- Public relations support through IPI programs such as Parking Matters® and Awards of Excellence.

18. Renewal

Once granted, the APO designation is good for three years, after which it will lapse and trigger a renewal process. The APO Board may choose to provide an expedited review process based on the prior submission, depending on improvements to the APO Program over that three-year period. Applicants will be informed of these changes at least six months prior to the expiry date of their accreditation to allow sufficient time for review and resubmission requirements.

After the first three-year cycle and successful renewal for the second three-year period, a full examination of documents, site review, and recommendation will be necessary to re-award the APO designation.

19. Fees

Participation fees to support the APO program are listed below, and may be adjusted annually. Reviewer fees will be contracted separately between the applicant and reviewing agency. The application fee will be paid to IPI when the request to pursue accreditation is submitted via the form posted on the website. The APO fee will be paid to IPI when the full application and all documentation is submitted by the applicant and reviewer to the APO Board. The APO fee includes the initial submittal of complete documentation including the reviewer's report, and allows for one resubmission to the APO Board if additional documentation or clarification is necessary.

If a second resubmittal becomes necessary, an additional fee may apply.

Questions or comments regarding the APO process should be directed to the designated staff point of contact listed at parking.org.

Fees	IPI Member Rate	Non-Member Rate
Application	$250	$750
APO (3-year period)	$2,500 *Accreditation fee includes up to 3 facilities.	$4,500
Additional Facility	$500 *Fee applies to the fourth and any additional facilities.	$500
Review Process	Determined by applicant and reviewer*	
Renewal Fee	$1,500	$3,000

The fees above are paid directly to IPI to support the APO program. The required reviewer fee will be contracted and paid directly to the selected reviewer from the applicant. IPI recommends that the applicant budget approximately $5,000 for reviewer fees, report, travel, and expenses, but acknowledges that each organization is unique and mayrequire a customized approach.

CODE OF ETHICS

Introduction

The APO Board has adopted a Code of Ethics and Professional Responsibility (Code of Ethics) that establishes the expected level of professional conduct and practice for an organization that holds APO Accreditation or Accreditation with Distinction. The APO Board retains the right to amend the Code of Ethics as required.

To promote and maintain the integrity of its APO program for the benefit of designation holders and stakeholders, the APO Board has the ability to enforce the provisions of the Code of Ethics. The APO Board shall be required to enforce sanctions against APOs who violate the regulations as written in the Code of Ethics. The APO Board will follow its disciplinary rules and procedures when enforcing the Code of Ethics. Any reference below to an APO also includes an APO's officers and directors.

APO Code of Ethics

The APO Board is the sole body authorized to award the APO designation. The APO designation bestows a recognized level of excellence in the field of professional parking organization, management, and operations. Part of that competence relates to an understanding that APOs and their leadership and staff will abide by the Code of Ethics, thereby protecting the public they serve. The purpose of this Code is to direct APOs to lead their organizations with competency, honesty, professionalism, integrity, and fairness, and to provide a benchmark code of conduct that stakeholders may expect.

To this end, the APO Board hereby establishes this Code of Ethics stating that all APOs are bound to:

I. Conduct their businesses according to high standards of integrity and fairness and to render that service to customers so that any "prudent person" would agree that the APOs conduct their businesses in a manner that is beyond reproach.

II. Provide competent, "customer-centric" service that serves all stakeholders and specifically protects the public.

III. Abide by all applicable governing rules, regulations, and standards.

The Code consists of two parts: The Principles and The Rules. The Principles embody the ethical and professional standards expected of APOs. These principles address the substance and not merely the form of service to customers. The Principles are the guidelines of professional conduct—the same conduct any customer would expect of any professional organization on which they rely. The Rules serve as a description of best-practice or APO standards and outline how The Principles must be implemented in specific circumstances.

The Principles

Principle 1. Organizational Competence: The APO shall provide services to stakeholders in a manner that demonstrates organizational competency. Organizational competency must be maintained through participation in recertification activities that demonstrate the APO has maintained the standards and criteria established in the APO Manual for Applicants and ancillary documents required in the role of the APO. Organizational competence also includes maintaining the organization's standing as an APO through continuous improvement and recertification.

Principle 2. Confidentiality: An APO, including its staff, shall not disclose any confidential customer information without the specific written consent of the customer unless the disclosure is made in response to a legal proceeding, to defend against charges of wrongdoing by the APO, or in connection with a civil dispute between the APO and a claimant. Confidentiality is a fundamental aspect of trust on which the professional customer relationship is based.

Principle 3. Professionalism: Conduct by the APO, including staff, in all matters shall reflect professionalism and good character, as expected by the APO designation. An APO represents the accreditation and may not behave in any manner that would discredit the designation or the program.

Principle 4. Fairness and Integrity: An APO shall perform its business and professional services in a manner that is fair and reasonable to customers, prospective customers, colleagues, employers, and regulators, and shall disclose any conflicts of interest associated with service as an APO. The APO must demonstrate integrity by serving customers, staff and the public with steadfast adherence to the APO Code of Ethics Rules and Principles, and the policies and procedures of the APO Board.

The Rules

Rules that Relate to Principle I: Competence

Rule 101: APOs shall keep informed of developments in the profession and provide continuing education to improve professional competence among all staff.

Rules that Relate to Principle II: Confidentiality

Rule 201: An APO, including its staff, shall not reveal or use, without the customer's consent, any personally identifiable information relating to the customer except and to the extent that disclosure or use is reasonably necessary to: (a) comply with legal requirements or legal process; (b) defend the APO against charges of wrongdoing; or (c) defend the APO in connection with a civil dispute between the APO and the customer.

Rule 202: An APO, including its staff shall maintain the same standards of confidentiality to employers and employees as to customers.

Rules that Relate to Principle III: Professionalism

Rule 301: An APO shall use the designation in compliance with the current rules and regulations of the APO Board, as established and amended.

Rule 302: An APO shall engage in fair and honorable competitive practices.

Rule 303: An APO who has knowledge that another APO has committed a violation of this Code must promptly notify the APO Board. A violation would be any act that raises substantial questions as to another APO's integrity, competence, or business practices. For the purposes of this Rule, knowledge means no substantial doubt.

Rule 304: An APO who has knowledge that raises a substantial question of legally actionable, unprofessional, fraudulent, or illegal conduct by an APO must promptly inform the appropriate regulatory body if appropriate, as well as the APO Board. For purposes of this Rule, knowledge means no substantial doubt.

Rule 305: An APO who has reason to suspect illegal conduct within the APO organization shall make timely disclosure of the available evidence to the designee's immediate supervisor and/or partners or co-owners, and take appropriate measures to remedy the problem. The APO shall, where appropriate, alert the proper regulatory authorities and the APO Board.

Rule 306: In all professional activities, an APO shall perform services in accordance with: (a) applicable laws, rules, and regulations of governmental and other applicable authorities; and (b) applicable rules, regulations, and other established policies of the APO Board.

Rule 307: An APO shall always act in the best interest of the customer and/or stakeholders, serving the overarching requirement to protect the public.

Rules that Relate to Principle IV: Fairness and Integrity

Rule 401: An APO shall not, during the course of rendering professional services, engage in conduct that involves dishonesty, fraud, deceit, or misrepresentation, or knowingly make a false or misleading statement to a customer, employer, employee, professional colleague, governmental or other regulatory body or official, or any other person or entity.

Rule 402: An APO is prohibited from the unauthorized or misleading use of the APO designation. If the APO renewal date has passed and the APO has not fulfilled requirements to maintain accreditation, the APO designation may not be used until the APO meets all requirements and pays all outstanding fees and fines. Additionally, APOs are prohibited from using the APO designation to represent their organization as specialists in a particular business service, or from using the designation in any way to mislead stakeholders about their expertise or breadth of experience.

Rule 403: An APO and its leadership shall not discriminate against others based on, but not limited to, gender, race, age, religion, disability, nationality, or sexual orientation.

Violation of the Code of Ethics

APOs that violate the Code of Ethics shall be subject to disciplinary action.

Content Area I: Accreditation Criteria

1. Governance and Organization

A parking organization's role, authority, responsibility, management expectations, and obligations are always defined in some documentation: a charter, ordinance, regulation, or other official document that is promulgated through the governance levels of the organization. An accredited program must be well-defined and empowered with a vision and mission statement or equivalent, and the organizational structure must be appropriate to meet the program's stated role and operational requirements. Its operations must be clearly aligned with the organization's governance document and defined by an effective and efficient organization structure.

Objective

To complete this section successfully, the applicant must demonstrate this alignment and provide accountable, transparent, responsive, justifiable, inclusive, and participatory parking, transportation, and mobility services to the community or constituencies it serves.

Accreditation Criteria

1.1 Provides a copy of official documentation that defines a contract, charter, ordinance or enabling legislation.*

1.2 Provides documentation showing governance hierarchy (Board of Directors/ Executive Director roles, responsibilities, terms, and relationships) is current; and policy-making authority, process, record-keeping, and decision-making are transparent.

1.3 Regulations regarding limits or restrictions on the organization's authority to change/amend rates, fines, use of funds, agency jurisdiction, operating rules, etc., are current and well-defined.

1.4 Current operational policies and procedures are documented with amendments and/or revisions.

1.5 Mission and Vision statements (or equivalent definitions of purpose) are current and available to the public, and to stakeholders and parent companies or organizations.

1.6 A current organizational chart is available and reflects the program's mission.

1.7 Comprehensive organizational structure is in place that clearly defines relationships between functions, process and staff assignments. Appropriate and accurate position descriptions are in place and current within three years of the accreditation inspection date.

1.8 Appropriate and accurate position descriptions are in place and current within three years of the accreditation inspection date.

Arielle Brown

Accredited with Distinction Criteria

Additional points will be awarded to organizations that further contribute to the accountable, transparent, responsive, and justifiable significance of governance and organization.

1.9 There is an active stakeholder committee, with a documented Terms of Reference, that participates in governance.

1.10 There is a senior leader or Executive Director with professional training in planning and delivery of parking services.

1.11 The senior leader or Executive Director represents the parking organization in public and the media.

1.12 Retains annual reports or departmental profiles that explain the role and mission of the parking organization.

1.13 Retains past performance documentation.

*Criteria in bold are required elements of the APO program

2. Planning and Monitoring

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Modern industry organizations and activities are developed to coincide with or be part of larger public transportation and mobility programs. Even private-sector activities, though not directly subject to government involvement, are guided in their course in accordance with public policy standards, as permitted through zoning and licensing requirements. All organizations possess goals and objectives that focus on desired outcomes and all organizations monitor and measure results to demonstrate progress toward those outcomes. IPI APOs routinely utilize a methodical and objective process of planning and monitoring based on regular and consistent observations, measurements, and analysis.

Objective

To complete this section successfully, the applicant must demonstrate that planning for the parking system, including any related transportation and communication elements, is consciously placed within the broader context of community or institutional planning goal. Regular monitoring of relevant performance indicators is an active part of the system management process.

Accreditation Criteria

2.1 Provides current documentation stating short- and long-term goals and identifying measurable objectives and timelines for achievement.

2.2 Provides documentation outlining planning process and procedures that translate daily activities into long-term or strategic planning – minimum two years beyond current fiscal year.

2.3 Planning includes an annual or multi-year budget and financial projection, with periodic tracking and analysis, and coordinated with related community or institutional planning entities.

2.4 Maintains a detailed and up-to-date inventory of all parking resources (permits, facilities, parking stalls).

2.5 Conducts parking supply, demand, and utilization studies at regular intervals.

2.6 Uses performance measurements in decision-making and regular benchmarking activities.

Accredited with Distinction Criteria

Additional points will be awarded to organizations that regularly apply the principles of planning and monitoring to daily operations and utilize these principles to maintain a culture of quality service and continuous improvement.

2.7 Demonstrates a solid understanding of the operational use of study results, metrics, and benchmarks.

2.8 Demonstrates a practice of using metrics to explain and illustrate features of the parking program to the public.

2.9 Participates in broader industry benchmarking and measurement studies and initiatives outside of his/her own organization or corporation.

2.10 Planning outlines the schedule and process for key day-to-day operational and administrative activities, including responsible staff, timing/communication, frequency and documentation to indicate activities are a well-established part of the organization's management process.

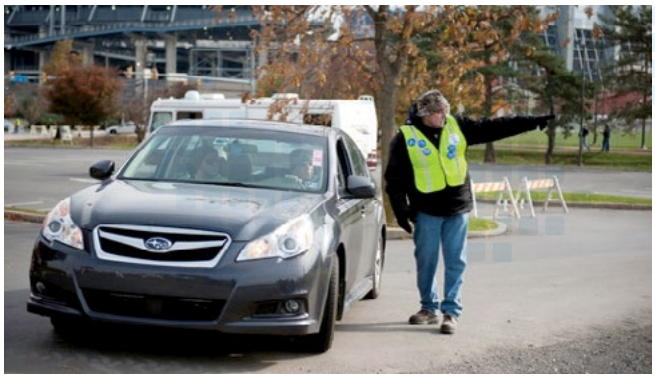
3. Financial Budgeting and Financial Management

While the financial expectation of any parking organization is defined in its role and mission, APOs operate in an atmosphere of transparency, accountability, and responsibility, in support of their role. The applicant must be committed to providing accurate and responsible financial transparency in accordance with Generally Accepted Accounting Principles (GAAP) or equivalent as may be determined by the organization's senior leadership.

Objective

To complete this section successfully, the applicant must demonstrate sound financial management practices in all aspects of planning, budgeting, cash and account management, and audit and reconciliation processes to accurately report the organization's financial position.

Accreditation Criteria



Annemarie Mountz

3.1 Mission and Vision or other guiding statements address financial principles, such as transparency, accountability, and responsibility.

3.2 Produces and maintains an annual budget and projects a future (three or more years) financial planning document.

3.3 Produces a monthly report identifying revenues and expenses, as well as variance budget to actual.

3.4 Maintains and regularly reviews organization's capital plan noting project status and associated budget financial status.

3.5 Maintains a calendar of planned and completed audits (revenue control, employee safety, environment, labor control and management, cost management, etc.).

3.6 Audits include all aspects of finance and operations, including cash and financial record keeping and management, as well as utilization and inventory control.

3.7 Maintains audit protocol and procedure documents.

3.8 Circulates documentation identifying audit findings or shortcomings to senior management, and management reviews recommendations.

3.9 Senior leadership (audit committee, etc.) responds to audit findings and recommendations and decides upon a plan of action and completion timeline, and documents response and plan of action.

3.10 Maintains current SOP for Accounts Payable/Accounts Receivable.

Accredited with Distinction Criteria

Additional points will be awarded to organizations that further contribute to an atmosphere of transparency, accountability, and responsibility of financial budgeting and management processes.

3.11 Reviews budget and performance documentation with authorized stakeholder groups.

3.12 Demonstrates consistent and acceptable financial performance year after year.

3.13 Financial performance meets or exceeds the targets established by the governing authority of the parent corporation.

3.14 Financial management is subject to routine internal audit and process improvement measures.

3.15 Produces a budget year-end financial report and operational summary.

3.16 Achieved a strong bond or credit rating based on a third-party reviewing agency.

3.17 Developed or achieved a level of public/private cooperation, such as a P3 partnership or other community partnership.

4. Customer Service

There are several components of good customer-service practices within an organization. Understanding customer needs is a top priority.

APOs include provision and maintenance of suitable customer-service infrastructure in all facilities and services, continuous customer-service improvement, a dedication to developing and/or supporting customer-service programs, and a demonstrated concern for customers' opinions and experiences. This includes follow-up and sourcing feedback regarding facilities and services and excellence in response to public and media inquiries.

Objective

To successfully complete this section, the applicant must demonstrate a high, progressive, and sustained level of communication, care, and service to end-use customers.

Accreditation Criteria

4.1 Commitment to service is identified and detailed in mission and/or vision statements.

4.2 Refers to philosophy of customer service in routine correspondence.

4.3 Refers to philosophy of customer service in long-and short-term planning documents.

4.4 Provides and maintains a proactive customer-service training program for all staff.

4.5 Conducts customer-service training for new staff.

4.6 Offers annual customer-service refresher training for all staff.

4.7 Responds to customer-service feedback.

4.8 Staff are available remotely or in person to assist customers.

4.9 Employs regular customer surveys (one-year interval minimum).

4.10 Demonstrates a variety of customer-service programs.

Accredited with Distinction Criteria

Additional points will be awarded to organizations that demonstrate a commitment to flexibility and offer customers a choice of services.

4.11 Provides a variety of parking payment options.

4.12 Provides a variety of parking permits options.

4.13 Provides a variety of choice options for response to compliance tickets or citations.

4.14 Provides a choice of mode of interaction: telephone, email, text, or in-person.

4.15 Utilizes social media to enhance customer service.

4.16 Gives credit to the team.

4.17 Offers customer-appreciation days, activities, or events. Conducts contests, special days, and special offers to promote its role and product, or relationship to its customers.

4.18 Engages stakeholders to assist in data collection or other tasks.

4.19 Engages stakeholders in the customer service survey and acts upon the results of the survey.

4.20 Uses rapid entrance and exit techniques for special event parking.

5. Personnel Education & Development

APOs pay strong attention to the initial and ongoing training of employees. The competence and effectiveness of employees is a driving factor behind an organization's parking program, and personal education and development is key to establishing a strong reputation for dealing fairly with the public.

Objective

To complete this section successfully, the applicant must demonstrate that the organization is invested in developing qualified, confident, and well-rounded individuals who are well-trained in professional parking knowledge to meet operational requirements, as well as human interaction and problem-solving to meet service objectives.

Accredited Criteria

5.1 Provides all staff with an employee handbook, or equivalent document(s) identifying roles, tasks, responsibilities, operational policies, and procedures.

5.2 Administers a training program that features a defined structure, outline, schedule, and materials.

5.3 Maintains current job descriptions for each position, and files training documentation for regular staff.

5.4 Provides an orientation to facilities, organization, operations and lines of authority, introductions, review of personnel policies for new staff.

5.5 Provides formal instruction on functional responsibilities and procedures.

5.6 Utilizes trainee assessment/testing to test comprehension of concepts and essential information.

5.7 Directly supervises employees while in training before they begin performing duties independently.

5.8 Uses follow-up training to address identified weaknesses and documents eventual competency.

5.9 Maintains process for annual evaluations and professional development of staff.

5.10 Utilizes evaluation criteria that are relevant to the functions and responsibilities of the employee, with an opportunity for written and verbal feedback.

5.11 Provides employees the opportunity for documented input into evaluation.

Accredited with Distinction Criteria

Additional points will be awarded to organizations that demonstrate advanced interest and achievement in the training and professional development of their employees.

5.12 In the case that an employee reports to multiple supervisors, provides opportunity for input from each supervisor.

5.13 Provides a range of other training programs for the benefit of employee or organization.

5.14 Senior manager is a Certified Administrator of Public Parking (CAPP).

5.15 Middle management team participates in CAPP or other professional development.

5.16 Supervisory and long-service staff participate in IPI professional development programs (or comparable equivalent) appropriate to their employment level, duties, and responsibilities.

6. Access and Revenue Control

APOs are always involved in managing access to parking facilities under varying conditions, and are involved in managing permits and credentials as well as cash, credit card, electronic purse, or other forms of value-accounted transactions. As these transactions are of relatively small value and usually occur in high volumes, the quality management of credentials and value—particularly cash value—is of central importance to the way organizations function and how they are perceived to function by our peers, stakeholders, customers, owners, and the public.

Conservation Design Forum

Objective

To complete this section successfully, the applicant must demonstrate a high level of sophistication in the care of physical assets used to manage and control access to parking stall inventory and to revenue accruing from the sale of parking stall inventory, as well as its related tokens, permits, fees, fines, and other products.

Accreditation Criteria

6.1 Maintains effective access and revenue control plan for all facilities and services.

6.2 Provides appropriate control methodologies (PARCs, timed parking, meters, etc.).

6.3 Provides a current SOP that includes access and revenue control requirements.

6.4 Provides a systematic and documented process for obtaining and evaluating collection data.

6.5 Equipment used to control facilities provides sufficient documentation for revenue generated.

6.6 Incorporates reporting features into accounting reconciliation and reporting processes that include both transactions and revenue.

6.7 Maintains a standard counting and reconciliation practice.

6.8 Conducts periodic unannounced or opportunity counts or audits.

6.9 Demonstrates that employees responsible for revenue management are trained in relevant policies, procedures, and audit processes.

6.10 Provides a write-off policy/procedure.

6.11 Maintains copies of bank transaction reports on at least a weekly basis that includes all forms of payment.

6.12 Requires supervisory sign-off on void transactions and reconciliation documentation.

6.13 Provides a process to resolve financial discrepancies.

6.14 Provides a current letter, contract, or agreement in-place between the applicant and any special event clients.

6.15 Provides an automated process for reserving and/or vending parking space for events.

6.16 Has the ability to issue a receipt to the customer during special-event parking operation.

6.17 Captures utilization reporting and routinely debriefs management and staff on the outcome of each event.

6.18 Vault or counting room is monitored and access control is maintained.

6.19 Properly limits and controls access to bulk permit or card stock.

6.20 Documents custody of unissued permits and access cards.

6.21 Inventories and counts meter canisters.

6.22 Procedures and/or report slips show cashier stations are subtotaled and cash counted periodically during each shift.

Accreditation with Distinction Criteria

Additional points will be awarded to organizations that show an advanced level of cash security, scrutiny, audit procedures and resources, and sound cash-management processes in all areas of its operation.

6.23 Monitors gate equipment and cashier positions controlling revenue areas with cameras.

6.24 Audit process includes periodic review of statistical patterns related to equipment activity, cashiering functions, and field revenue collections.

6.25 Provides a copy of most recent third-party audit (external or internal).

7. Asset Maintenance

APOs manage major public facilities in such a way as to provide responsible, efficient, and valuable customer services to their customers, in support of their stakeholder and owner objectives.

Objective

To complete this section successfully, the applicant must demonstrate an active asset maintenance program that ensures regular and consistent monitoring, cleaning, and repair of parking facilities and supporting assets.

Accreditation Criteria

7.1 Demonstrates that regular onsite inspections are an integral part of facility maintenance.

7.2 Tests emergency systems regularly.

7.3 Maintains a maintenance program that includes inventory of maintenance items.

7.4 Maintains copies of current maintenance agreements with third parties.

7.5 Maintains a capital renewal plan.

7.6 Budgets for maintenance reserves or funds set aside for parking facilities and services replacement and upgrade.

7.7 Performs condition assessments by a qualified structural engineer, who conducts a walk-through inspection (annually).

7.8 Performs condition assessments by a qualified structural engineer who conducts a full condition assessment including all disciplines (once every three years at a minimum).

7.9 Provides a reconciliation report and schedule of repair completion for items identified in the condition appraisal.

Accreditation with Distinction Criteria

Additional points will be awarded to organizations demonstrating an advanced level of care and attention to detail invested in asset inspection, maintenance, and updates. The applicant must confirm that an advanced maintenance program is functioning in accordance with a developed and formal work order and tracking process.

7.9 Maintains a maintenance program in accordance with Parking Consultants Council or equivalent guidelines, including a formal work order and tracking process.

7.10 Posts maintenance, ownership, and contact information and hours of operation.

7.11 Regulations and restrictions are posted and explained at customer-service locations.

7.12 Replaces lighting ballasts and illuminators on a regular basis.

7.13 Encourages customers to report security breaches or risks, and follows up with recorded action.

7.14 Conducts routine physical security audits.

7.15 Offers car wash, concierge, laundry, vehicle repair, or other value-added services.

8. Regulations, Enforcement, Adjudication and Collections

APOs often operate, or influence the operation of, enforcement programs intended to discourage non- compliance with public laws or ordinances, or private- property management standards. The purpose of an enforcement program is to hold vehicle owners personally and sometimes financially accountable for their actions, to raise awareness through education, and to promote and encourage corrective behavior to avoid a repeat situation. While the traditional enforcement role sends a negative message, organizations are increasingly developing practices and techniques that emphasize the positive side of encouraging compliance, rather than discouraging misuse.

Objective

To complete this section successfully, the applicant must demonstrate that their organization provides professional and flexible services in accordance with modern technologies, service-delivery options, and best modern compliance practices.

Accreditation Criteria

8.1 Documents current compliance goals designed to encourage voluntary compliance.

8.2 Regulations and processes related to enforcement and appeals are transparent and available to the public.

8.3 Uses data to allocate resources and improve effectiveness (voluntary compliance).

8.4 Conducts periodic review of patrol zones and activities.

8.5 Reviews officer performance and productivity monthly.

8.6 Utilizes positive customer-service techniques to encourage compliance.

8.7 Conducts daily shift briefings or other daily communication/updates.

8.8 Details role of enforcement and compliance in training materials.

8.9 Uses technology to monitor patrol routes and officer activities.

8.10 Uses digital images to document and improve the accuracy of the enforcement process.

8.11 Officers are identifiable and uniformed.

8.12 Utilizes hand-held computer, License Plate Recognition, or equivalent systems that tie regulation, customer performance, and administrative service delivery together in a comprehensive way.

8.13 Offers a transparent and publicly available appeals program.

8.14 Offers appellants access to a multi-level review process.

InventorChris.

8.15 Considers the views of adjudicators when regulations are designed.

8.16 Demonstrates that citations written in error represent fewer than 2% of all citations.

8.17 Uses a fine-collection process exists.

8.18 The fine collection process collects 80 percent or more of fines.

8.19 Maintains a boot/tow policy.

8.20 Trains officer/third-party providers in the boot/tow process in customer service and conflict resolution.

8.21 Provides 24 hour service at impound facility and vehicle storage areas.

Accreditation with Distinction Criteria

Additional points will be awarded to organizations that demonstrate an advanced approach to gaining compliance through enforcement, adjudication, and collection systems, as well as positive compliance-gaining techniques.

8.22 Demonstrates an advanced degree of care for the customer during the enforcement, adjudication, and collection process.

8.23 Enforcement staff works with customer-service to ensure that service issues are dealt with in the office environment rather than in the public eye.

8.24 Uses principles of parking supply/demand measurement, capture, and patrol frequency to optimize the enforcement process.

8.25 Works proactively with the court system to ensure that regulations are being documented and processed in an acceptable manner, and that new practices and procedures will be supported by the adjudication process.

8.26 Utilizes customer-performance data to determine appropriate corrective action.

8.27 Provides appellants access to an objective third-party (court of law, adjudication committee, etc.).

8.28 Adopted parking ambassador program or approach.

9. Safety, Security, and Risk Management

APOs work dynamically and proactively to establish a superior personal safety and property security presence for their customers and stakeholders, and manage their owners' risk responsibly.

Objective

Accreditation Criteria

9.1 Outlines safety and security philosophy in organization objectives and values.

9.2 Documents effective workplace safety and risk management practices.

9.3 Maintains SOPs or manuals and conducts testing, drills, and emergency communication procedures (i.e., 911, police, fire, administration, supervision.)

9.4 Conducts periodic inspection of facility infrastructure and maintains documentation of inspections.

9.5 Incorporates passive and active security measures in facility design and operation.

9.6 Responds to public safety inquiries.

9.7 Security staff are identifiable and uniformed.

9.8 Trains security staff to respond to public safety and security issues.

Accreditation with Distinction Criteria

Additional points will be awarded to organizations that ca demonstrate an exemplary level of safety and security awareness and response.

9.9 Participates in community safety and security organizations.

9.10 Utilizes customer surveys in assessing security and safety measures.

9.11 Develops safety-oriented partnerships with stakeholder and other interested groups.

9.12 Provides onsite security staff or equivalent personnel.

10. Sustainability

APOs demonstrate a high level of attention to progressive environmental practices and standards, and show leadership in all aspects of their roles as environmental stewards.

Objective

To complete this section successfully, the applicant must demonstrate that the program, sets specific goals for energy and resource consumption, and shows progress toward reaching its sustainability goals.

Accreditation Criteria

10.1 Demonstrates a strategic commitment to environmental sustainability.

10.2 Demonstrates implementation of sustainable practices showcasing a direct reduction in energy or resource use.

10.3 Provides incentives to promote use of low-emitting and fuel-efficient or alternative fuel vehicles.

10.4 Demonstrates use of alternative-fuel fleet vehicles.

10.5 Provides payment system in parking facilities to reduce idling upon exiting.

10.6 Recycles or repurposes materials and equipment (recycling paper, reusing signs).

10.7 Uses energy-efficient lighting systems and/or controls in parking facilities.

10.8 Uses energy-efficient, environmentally favorable Heating Ventilation and Air Conditioning (HVAC) systems and/or controls in facilities requiring ventilation, or facilities designed without mechanical ventilation.

10.9 Uses halon-free fire-suppression systems.

10.10 Demonstrates planning for continued sustainability gains.

Center for Watershed Protection, Inc.

Accreditation with Distinction Criteria

10.11 Achieved GPC (now Parksmart), LEED, Green Globes or equivalent certification for at least one parking facility.

10.12 Posts policies regarding sustainability in prominent public space.

10.13 Manager(s) directly responsible for day-to-day parking operations has earned and maintained a qualified environmental sustainability credential.

10.14 Implemented external wayfinding system to reduce time spent searching for a parking space.

10.15 Implemented internal wayfinding system within parking facility or facilities to reduce time drivers spend locating a space.

10.16 Installed and maintains electric vehicle charging stations.

10.17 Provide tire inflation stations or mobile tire inflation services.

10.18 Implemented water-reduction technologies/strategies.

10.19 Roofing system designed to reduce heat-island effect and/or provide stormwater mitigation.

10.20 Generates renewable energy on site, and/or purchases of renewable energy credits.

10.21 Provides proactive parking facility maintenance plan.

10.22 Uses permeable materials in at least in one surface parking facility.

11. Access Management

APOs champion transportation solutions that connect people to where they need to go, while reducing congestion, wear-and-tear on surrounding infrastructure, and environmental damage.

Objective

To complete the section successfully, the applicant must demonstrate a commitment to travel demand management strategies, employing techniques designed to support multi-modal transportation solutions that promote walking, cycling, and transit use, and control motor vehicle access.

Accreditation Criteria

11.1 **Demonstrates a commitment to reducing or distributing travel demand.**

11.2 Charges for parking to impact transportation choice.

11.3 Provides for or supports the use of bicycles.

11.4 Provides for or supports the use of carpooling or vanpooling.

11.5 Uses parking guidance, traffic management or parking reservation systems.

11.6 Provides for or supports car share programs or services.

11.7 Provides for or supports bicycle share programs or services.

11.8 Parking facilities are located at least.25 miles from mass transit services.

Accreditation with Distinction Criteria

An additional score will be awarded to organizations who demonstrate the development of enhanced mobility programs and/or policies to support users of alternative transportation modes.

11.9 Participates in a TMA/TMO or similar organization aimed at reducing congestion and travel demand.

11.10 Provides for or supports guaranteed ride home programs and services.

11.11 Provides for or supports ride matching services.

11.12 Provides for or supports transit, universal bus pass, or shuttle services.

11.13 Provides short-term, occasional parking options for flexible commuting.

11.14 Parking facilities are part of, or proximate to, Transit Oriented Developments.

12. Marketing and Communications

APOs recognize the need to educate and form their customers' impressions and responses to the parking environment, as well as its current standards and best practices. This is accomplished through marketing and communications programs targeted at individuals, customers, or stakeholder groups, as well as ownership authorities and the general public.

Objective

To complete this section successfully, the applicant must establish commitment to strategic excellence in communications, marketing, and community relations.

Accreditation Criteria

12.1 **Develops and maintains a communications and marketing plan that supports the program's larger strategic goals.**

12.2 Strategic-planning documents specifically focus on communications and marketing which are reviewed annually and current.

12.3 **Annual budget includes dedicated funding for communication and marketing activities.**

12.4 Provides opportunities for customer feedback (at least quarterly) and responds to feedback.

12.5 Media relations protocols include a specific list of approved media spokespeople and chain-of-command for approving and reviewing information that is released to the media.

12.6 Employs a current media list that includes key media organizations and contact information for key staff.

12.7 Uses a press/news release template.

12.8 Crisis/emergency situation protocols, including a specific list of key contacts, clearly defined chain-of-command and areas of responsibility are in-place.

12.9 Maintains expedited method of communication specifically for crisis/emergency situations.

12.10 Maintains policies and/or procedures for addressing annual, seasonal, campaign-based, and event-specific communications functions in a timely manner (i.e., special events, construction, service disruption, and routine maintenance).

12.11 Branding includes a logo or distinct visual marker that is consistent across media.

12.12 Website includes 1) map of facilities, pricing, payment options, 2) contact email, phone number, hours of operation; 3) instructions for after-hour emergencies; 4) how to pay and/or appeal a citation; 5) information on monthly parking, if applicable; 6) ADA information.

Accreditation with Distinction Criteria

Additional points will be awarded to organizations that demonstrate an exemplary and exceptional commitment to marketing, promotions, and community outreach.

12.14 Shares best practices in marketing and communications with parking industry colleagues.

12.15 Conducts information sessions for the public and can demonstrate how feedback is incorporated into operational efforts.

12.16 Posts up-to-date information on programs and practices in public places and online.

12.17 Participates in public events, public-education sessions, lunch-and-learn sessions, or other awareness- and confidence-building activities.

12.18 Utilizes new communication technologies (YouTube, social media, blogs, etc.) to reinforce its message to the public.

12.19 Uses resources to support community quality-of-life programs.

13. Data Management and Security

The industry is experiencing increased gathering and retention of personal data; in the parking industry, some of this data is critical to management functions and some is not. POs recognize the need to retain key data points for the purpose of compiling histories, assessing behaviors, managing programs, facilitating purchases, and educating customers; the need to protect this information while in custody; and the requirement to discard this information when it is no longer relevant or necessary.

Objective

To complete this section successfully, the applicant must clearly demonstrate a commitment to data security in compliance with Payment Card Industry (PCI) standards and parking industry best practices.

Accreditation Criteria

13.1 **Has a policy for protecting sensitive data and retaining or destroying secure data.**

13.2 Provides a policy that outlines the type of Personally Identifiable Information (PII) used/collected, individual responsibilities, how sensitive data is processed when expired, and references appropriate laws.

13.3 Provides a policy that defines how access to systems is managed and controlled.

13.4 Contractually requires all vendors to follow the applicant's data and IT security policies.

13.5 Maintains inventory of all IT assets and data assets and where they are located.

13.6 For organizations accepting payment cards: Submits to Payment Card Industry (PCI) certification or self-certifications, and ensures timely security scans; any issues are documented and resolved in a timely manner.

13.7 Employing Tokenization for web based transactions.

13.8 Reviews existing systems to ensure that necessary patches and updates (operating systems, applications, etc.) are performed and implemented in a timely manner.

13.9 Uses firewalls, gateway antivirus, intrusion-detection devices, and other forms of dynamic monitoring to screen for vulnerabilities.

13.10 **All equipment and services purchased are certified as PCI-DSS- or PA-DSS-compliant.**

13.11 Vulnerability scans should be performed and reviewed monthly (at a minimum).

13.12 Encrypts all sensitive personal information and credit card data.

Accreditation with Distinction Criteria

13.13 Conducts a quarterly review of users and their permissions.

13.14 Vulnerability scan should be performed and reviewed weekly (at a minimum).

13.15 Servers are in locked cabinets or secure locations and firewalls are actively managed with consistent monitoring for intrusion (PCI requirement).

13.16 Purges non-essential data in accordance with the data-retention policy.

13.17 Ensures that all employees complete annual data security, PII, or PCI recurring training.

13.18 Retains an inventory of all devices connected to network that touch or store personal or credit card data.

13.19 Has limited, or eliminated, the use of removable data/media storage and any writeable media related to personal or credit card data.

13.20 Has a response plan for a data security breach.

13.21 Employing Point to Point Encryption solutions.

14. Third Party Contractors and Service Level Agreements

Most private parking facilities and services utilize multiple service providers to deliver elements of their services. APOs establish high-quality standards in the selection and retention of their contractors. In some cases, individual contractors may seek IPI accreditation for the services or elements of services they provide.

If a service provider has been independently accredited by IPI based on achievement of basic or advanced best practices, and those practices have been officially and completely adopted and implemented by the facility or service owner (individually or in a group of practices), IPI will award points equivalent to the contractor's achievement. If a facility or service owner has recently changed contractors, the owner must advise IPI of the change and provide a statement and copy of contractual clauses that assure accredited activities will remain in place. If these activities do not remain in place or standards have perceptibly declined, APO status will be revoked.

Objective

APOs engage in a constant process to ensure that contracts and agreements are properly structured and reviewed appropriately, and that both service provider and facility owner are meeting their responsibilities in support of service delivery.

Accreditation Criteria

14.1 The applicant maintains active contracts with external service providers.

14.2 Uses Memorandums of Understanding (MOUs) or Service Level Agreements (SLAs) with internal service providers.

14.3 Contracts/agreements include a defined start and end date, and clear and precise renewal terms.

14.4 Contracts/agreements include a statement of work that clearly defines the work to be performed by contractor/service provider.

14.5 Contracts/agreements incorporate specific performance objectives and a written process of measuring and assessing progress toward goals and objectives.

14.6 Holds periodic performance reviews with third parties and identifies performance deficiencies against performance objectives annually (at a minimum).

14.7 Documents the specific modules of accreditation that third parties deliver on behalf of the applicant.

14.8 Maintains process/policy for amending contracts/agreements, including clear documentation of changes.

Accreditation with Distinction Criteria

An additional point will be awarded to organizations that demonstrate a strong commitment to contracted quality service standards.

14.9 Requires performance guarantees in contracts, MOUs, and/or SLAs.

Content Area II: Site-Visit Assessment

APOs portray an exemplary image to the customer, in keeping with global best practices. This is one of the most important elements of accreditation. As part of the assessment process, a reviewer will visit each applicant site as noted on the application and independently spot- check all field operations and facilities to ensure the following items are in place and functioning, in support of APO standards:

1.1 Approach, internal, and guidance signage is clear, concise, appropriate, and appears to be "fresh" and well-maintained.

1.2 Signage clearly shows posted hours of operation and rates.

1.3 There are no unnecessary, out of date, overly redundant or unprofessional looking signs.

1.4 Compliance and information signs are visible to drivers.

1.5 Reserved or special needs signs are correctly placed for the reserved group or individual serviced.

1.6 Compliance and information signs use international symbols and are in common use.

1.7 Wayfinding, identification and regulatory signage and associated systems are current, clear, concise, and refreshed.

1.8 Signs are designed with highly-contrasting elements (dark background with light graphics or vice versa).

1.9 Deck level guidance information is available.

1.10 Pay by cell signs or labels are present and generously distributed.

1.11 Area is free of dangerous conditions, i.e., materials, activities, construction, refuse.

1.12 Emergency and communications services are clearly marked and functional, all lights and systems functioning.

1.13 All areas accessible to the public are open and visible, and devices are placed so to minimize dark or non-visible areas.

1.14 Sight lines are clear to exits.

1.15 Lights make use of bright, white light.

1.16 Lighting is complete and intact, all lights are active, and there are no dark areas.

1.17 Lighting, fixtures and machine surface fixtures or interfaces are shatter proof and/or protected.

1.18 Entry/Exit plazas, drive aisles, parking bays and drive aisles are evenly illuminated.

1.19 Lighting spill over is mitigated.

1.20 Parking surfaces and pedestrian areas are clean and free of road grit, water, refuse, and non-vehicle items or storage.

1.21 Asphalt and concrete surfaces are free of chips, potholes, cracks or slab heaves and trip edges.

1.22 All curbs and stall demarcations are freshly painted and visible to the parker.

1.23 Parking and pedestrian areas are free from snow/ice/water and other obstructions.

1.24 Sign posts are straight and appropriately placed.

1.25 Landscaped edges, boulevards, grass and gardens are trimmed and weeded.

1.26 Layout and perimeter edge treatments allow easy pedestrian access and egress.

1.27 Overhead railings, pipes, conduits, and other level surfaces are free from dust, dirt, soot, bird droppings, or other substances.

1.28 Concrete spalls or delaminations have been repaired and patched.

1.29 No salt or water stains.

1.30 Membranes intact and complete.

1.31 Expansion joints secure.

1.32 Decks are not leaking.

1.33 Heating or climate control processes, if fitted, are functioning and in place.

1.34 Outside pedestrian doors are glazed (has glass panes or panels for visibility).

1.35 Field test of payment system functions properly.

1.36 Where cash change is available, correct change is returned.

1.37 Machine issues receipts that include the name of the parking vendor, date time limits and fees associated with the purchase.

1.38 Information on what to do if the machine is out of service is clearly communicated.

1.39 All field transactions have credit card or other remote payment capability.

1.40 All field booth facilities are neatly maintained and painted.

1.41 Where a PARCS is used, all machines are operational, tidy and in good order.

1.42 Where a PARCS or metering is used, there are additional machines for redundancy (in case one goes off line).

1.43 Speed control devices, if fitted, are functional and effective.

ACCREDITED PARKING ORGANIZATION

APO Application

Congratulations on taking the first step to pursue the Accredited Parking Organization (APO) designation. Earning the APO designation assures the public that a parking program meets nationally and internationally endorsed standards for professionalism, accountability, creativity, responsibility, and performance. By undertaking this process, your organization demonstrates its commitment to ongoing evaluation and improvement of program outcomes through the implementation of industry best practices.

Date of Application[1]: _____

Organization/Company Name: _____

IPI Member ☐ **yes** ☐ **no** _____ **IPI Member Number:** _____

Type:

- ☐ Academic (college/university, school)
- ☐ Airport
- ☐ Commercial Operations (private operators, shuttle services)
- ☐ Corporate (building owners, developers, entertainment, resort, retail)
- ☐ Hospital/Medical or Healthcare Facility
- ☐ Public (city, economic development, municipality, public works, police, law enforcement)
- ☐ Transit/Transportation (bus highway, rail)
- ☐ Other (please specify): _____

This application is for (select one of two choices below).

☐ Parking Organization — A parking organization is an entity that operates, manages, owns or leases parking facilities (defined as: parking lot(s), garage(s), ramps, carparks, etc. and on-street parking spaces).

Example: ABC airport has parking that is close to the airport and also runs multiple airports within the state. IPI Member pricing: Application Fee ($250); Accreditation Fee ($2,500).

OR

☐ Multi-Site Parking Organization — A parking organization may operate, manage, own or lease parking sites that are not in close physical proximity. Despite geographic distance, sites are managed with common policies and procedures by the same parking organization. In this case, they may be included in the same APO application.

Example: ACME University operates, manages, owns or leases parking facilities that are not in close proximity, for instance in separate cities. Member pricing: Application Fee ($250); Accreditation Fee ($2,500, including first three facilities) plus $500 per additional facility.

Please provide a short narrative providing detail on the scope of your organization (i.e. number of facilities, type of facilities, etc.):

_____

_____

_____

[1] IPI will confirm receipt of application. On the date that the applicant organization receives confirmation, the one year submission period begins. Applicant must submit full documentation package to IPI within that one year period, or the application process will start anew with a new application and accompanying fee.

Website: _____

Primary Contact Name: _____ **Title:** _____

Mailing Address: _____

Telephone: _____ **Email:** _____

Secondary Contact Name: _____ **Title:** _____
(if applicable)

Mailing Address: _____

Telephone: _____ **Email:** _____

Fees:

Application fees are due at the time of application ($250 IPI member/$750 non-member[1]).

Accreditation fees for the three year accreditation ($2,500 IPI member/$4,500 non-member) are due at the time of submission of complete documentation package.

Please note that payment and completed application must be received before candidate may begin the accreditation process.

Check one:

- ☐ I have included a check with this application. Check # _____
- ☐ I have paid for the application fee online at parking.org.

Initial the following:

_____ I have reviewed and understand the requirements and criteria outlined in the APO Manual for Applicants and the APO Matrix. I have conducted an internal self-assessment of my organization, and have determined that I am eligible for Accredited and/or Accredited with Distinction status, and that my organization will be able to provide documentation to support the criteria.

_____ I agree to abide by the Code of Ethics contained in the APO Manual for Applicants.

_____ I understand the application fee is non-refundable.

_____ I understand that the applicant organization will be responsible for the cost to procure Site Review by an IPI-approved Site Reviewer[2], and that this is a required and critical step in the accreditation process [3].

_____ I understand that I will be required to submit a Site Reviewer Potential Conflict of Interest Form when Site Reviewer is selected, which will disclose existing relationships required (vendor/client, former employee/employer, other relationships, etc.)[4].

Signature: _____ **Date:** _____

Printed Name: _____

[1] Member rates apply to the organization pursuing accreditation, not to the selected Site Reviewer.

[2] IPI recommends that applicants budget $5,000 for reviewer fees, report, travel, and expenses for a two-day on-site meeting and review, but acknowledges that each organization is unique and may require a customized approach.

[3] Accreditation is based on a third-party review and final approval by the APO Board, and IPI is not responsible for the outcome of the accreditation process.

[4] Conflicts of interest that disqualify a site reviewer from performing services include: 1) existing employee of applicant organization or 2) family relationship to employees of applicant organization.

U.S. Department of Transportation
Federal Highway Administration

MANAGING TRAVEL FOR PLANNED SPECIAL EVENTS

FINAL REPORT

SEPTEMBER 2003

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16. Abstract

This handbook presents and recommends policies, regulations, planning and operations processes, impact mitigation strategies, equipment and personnel resources, and technology applications used in the advance planning, management, and monitoring of travel for planned special events.

This handbook was written to assist responsible agencies in managing the ever-increasing number of planned special events impacting transportation system operations in rural, urban, and metropolitan areas. It communicates to a wide audience, assisting readers that possess the following backgrounds: (1) novice planned special event practitioner, (2) experienced planned special event practitioner, (3) local, single-jurisdiction event planning and management, (4) regional, multi-jurisdiction event planning and management.

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- New York State Department of Transportation
- New York State Police
- Road Commission for Oakland County (MI)
- TRIMARC
- University of South Florida
- Utah Department of Transportation
- West Virginia University
- Wisconsin Department of Transportation

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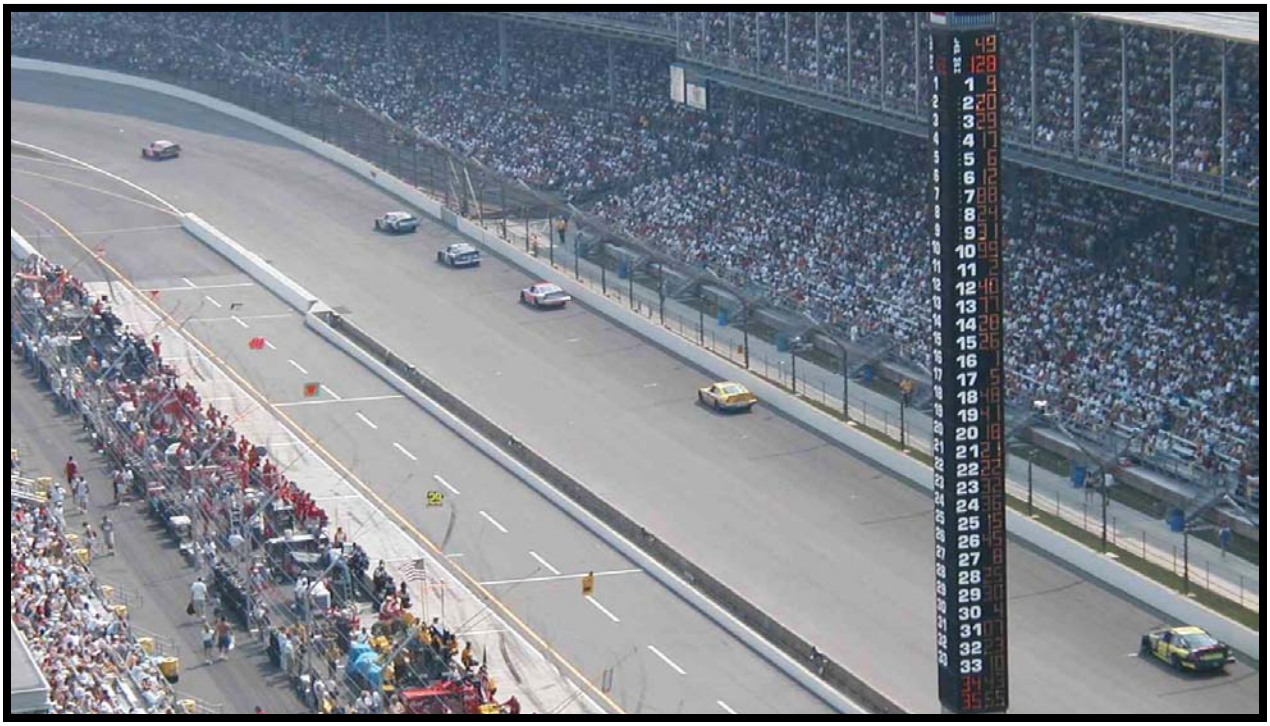

Figure i-1
Planned Special Event

PLANNED SPECIAL EVENTS

Planned special events include sporting events, concerts, festivals, and conventions occurring at permanent multi-use venues (e.g., arenas, stadiums, racetracks, fairgrounds, amphitheaters, convention centers, etc.). They also include less frequent public events such as parades, fireworks displays, bicycle races, sporting games, motorcycle rallies, seasonal festivals, and milestone celebrations at temporary venues.

The term *planned* special event is used to describe these activities because of their known locations, scheduled times of occurrence, and associated operating characteristics. Emergencies, such as a severe weather event or other major catastrophe, represent special events that can induce extreme traffic demand under an evacuation condition. However, these events occur at random and with little or no advance warning, thus contrasting characteristics of planned special events.

A planned special event creates an increase in travel demand and may require road closures to stage the event. Planned special events generate trips, thus impacting overall transportation system operations. This includes freeway operations, arterial and other street operations, transit operations, and pedestrian flow. Unlike roadway construction activities or traffic incidents that constrain travel within a single corridor, planned special events affect travel in all corridors serving the event venue.

BACKGROUND

Planned special events pose a unique and diverse set of challenges to stakeholders charged with maintaining transportation system safety, mobility, and reliability. These challenges include:

- Managing intense travel demand
- Mitigating potential capacity constraints
- Influencing the utility associated with various travel choices
- Accommodating heavy pedestrian flow

Managing travel for planned special events encompasses both a local and regional level. The local level involves managing travel for one planned special event. The regional perspective concerns proactively improving travel management for all planned special events occurring in a region where, in most major U.S. metropolitan areas, hundreds of planned special events occur annually.

Table i-1 compares current state-of-the-practice activities to state-of-the-art activities in managing travel for planned special events.

Table i-1
Practice of Managing Travel for Planned Special Events

STATE-OF-THE-PRACTICE	STATE-OF-THE-ART
Institutional	
• Manage traffic and parking for planned special events.	• Manage travel for planned special events by adopting an intermodal approach and utilizing travel demand management strategies.
• Focus on traffic management team needs.	• Form multidisciplinary stakeholder groups and solicit public input.
• Secure verbal coordination between stakeholders.	• Develop a joint operations policy or mutual-aid agreement between stakeholders.
• Focus on single planned special events.	• Create a committee on planned special events to monitor and plan travel management activities for all special events that occur within a region.
Organizational	
• Conduct periodic ad-hoc event planning.	• Follow an established event operations planning process. • Develop standard street use event routes and traffic flow routes.
• Focus on event-specific planning and operations only.	• Integrate event evaluation results into future planning activities to facilitate continuous improvement of transportation system performance.
• Obtain periodic participation and contribution from community interest and event support stakeholders.	• Establish stakeholder groups specific to advance planning and day-of-event activities to strengthen stakeholder coordination and commitment.
Technical	
• Utilize fixed freeway and arterial management infrastructure to monitor and manage traffic during a planned special event.(1)	• Utilize mobile devices:(1) o Portable traffic management systems (closed-circuit television, detectors, changeable message signs) o Portable traffic signals o Portable traffic management centers
• Conduct point traffic and parking management using field personnel	• Deploy automated systems: o Parking management systems o Dynamic trailblazer signs o Lane control signs o Blank-out signs

The *state-of-the-practice* involves an *operations-based approach* that incorporates existing policies, procedures, and infrastructure applied under daily traffic management, incident management, and multi-modal management activities. In this approach, stakeholder planning activities parallel those for unplanned events, such as traffic incidents and emergencies, where various *what-if* scenarios shape response and management strategies. Stakeholders characteristically diverge from an interagency concept of operations and, instead, focus on the rapid mobilization and execution of planned agency-specific tasks.

However, incident management or emergency response experiences provide the opportunity to build on existing stakeholder relationships, although it must be recognized that stakeholder roles and priorities change considerably under planned special events. This technical reference will facilitate building a successful special event transportation management plan starting from a cornerstone of daily traffic, incident, and multi-modal management activities.

The *state-of-the-art* in managing travel for planned special events emphasizes a *program approach* specific to planned special events. This approach revolves around distinct, chronological phases relative to advance planning, management, and evaluation activities. Individual phases include interconnected strategies to assist stakeholders in identifying needs and resulting operations and service strategies tailored to the characteristics of a specific planned special event:

- Operations strategies include proactive control and management tactics, coupled with innovative technology applications, that effect changes in traffic and transit operations to improve safety and reduce delay in addition to reducing field personnel requirements.
- Service strategies include policies and initiatives aimed at communicating advisory information and travel options to event patrons and non-attendee road users to reduce peak traffic demand levels on corridors serving an event venue, thus improving system travel mobility and reliability.

Collectively, these strategies meet the challenge of managing travel for planned special events on a *local level* or for a single planned special event. Stakeholders must predict travel demand and efficiently utilize the excess capacity of the roadway system, parking facilities, and transit. They must also reach out to all road users, communicate travel information, and offer attractive incentives to influence traveler behavior and decision-making.

Integration of phases, from post-event evaluation to advance planning for future planned special events, creates a seamless process allowing for continuous improvement of transportation system performance from one planned special event to the next. This iterative process, where stakeholders apply successes and lessons learned from a particular special event to future events, meets the challenge of managing travel for planned special events on a *regional level* or for all planned special events in a region.

The advance planning and management of travel for planned special events requires the consistent involvement and coordination of stakeholders within and across every event management phase. Stakeholders may have the opportunity to partner with new stakeholders across travel modes, disciplines, and jurisdictions. As a result, the state-of-the-art

includes forming multidisciplinary stakeholder groups assigned to carryout the objectives of a particular phase of managing travel for planned special events. This framework facilitates easy buy-in by agencies not involved in day-to-day transportation system operations and achieves better stakeholder consensus on group objectives.

PURPOSE

Given the dynamic characteristics of planned special events, the Federal Highway Administration (FHWA) Transportation Management Center Pooled-Fund Study (TMC PFS) recognized the need to identify operations planning and program issues, derive operational strategies and plans, and examine successful interagency cooperation and communication techniques specific to planned special events. In turn, the TMC PFS commissioned development of a technical reference document that provides direction, guidance, and recommended practices related to the proactive management of planned special events. It builds on the state-of-the-practice in managing travel for planned special events and strives to complement and advance the present capabilities of TMCs in addition to that of traffic management programs in metropolitan, urban, and rural areas.

This technical reference bridges the gap between the state-of-the-practice and state-of-the-art in managing travel for planned special events by providing both: (1) a framework for establishing a stakeholder coordinated and integrated planned special event management practice and (2) innovative techniques for enhancing the efficiency and applicability of current agency event-specific plans. This handbook presents and recommends various processes, operations strategies, service strategies, and technology applications that satisfy the special customer requirements and stakeholder performance requirements driving planned special event travel management. It profiles numerous successful practices, highlighting proven policies, regulations, strategies, and resources used in the advance planning, management, and monitoring of travel for planned special events.

This handbook was written to assist responsible agencies in managing the ever-increasing number of planned special events impacting transportation system operations in rural, urban, and metropolitan areas. It communicates to a wide audience, assisting readers that possess the following backgrounds: (1) novice planned special event practitioner, (2) experienced planned special event practitioner, (3) local, single-jurisdiction event planning and management, (4) regional, multi-jurisdiction event planning and management. This technical reference facilitates easy extraction of guidelines, processes, operations strategies, service strategies, and associated tactics to meet the needs of transportation system operators. In turn, operators will gain an understanding of the keys to successful planned special event transportation management, as summarized in Table i-2.

Table i-2
Keys to Successful Management
of Planned Special Events

KEY EFFORTS
• Achieve early, constant input and participation of involved agencies.
• Predict event-generated travel impacts on both a local and regional level.
• Develop an integrated transportation management plan that can accommodate a range of traffic demands and other contingencies.
• Ensure successful traffic management plan implementation.
• Deploy a well-organized traffic management team equipped with the ability to communicate seamlessly between agencies.

Table i-2 (cont'd.)
Keys to Successful Management
of Planned Special Events

KEY EFFORTS
• Conduct continuous traffic monitoring on the day-of-event and maintain protocol for modifying the traffic management plan to accommodate real-time traffic conditions. • Transfer event management successes into daily applications, and translate lessons learned into future event planning and operations needs.

REFERENCES

1. Jacobson, L., *Highway Traffic Operations and Freeway Management State-of-the-Practice White Paper*, Report No. FHWA-OP-03-076, Federal Highway Administration, Washington, D.C., March 2003, 43 pp.

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CHAPTER ONE
BACKGROUND

Figure 1-1
Planned Special Event Patron Arrival

DEFINITION

A planned special event *is a public activity, with a scheduled time and location, that impacts normal transportation system operations as a result of increased travel demand and/or reduced capacity attributed to event staging.*

STATEMENT OF THE PROBLEM

Sources of Congestion

The public has become increasingly sensitive to the impact congestion has on *quality of life*, citing delays caused by traffic congestion as their top community transportation concern in a recent National survey.[1] Congestion equates to decreased performance and, in turn, economic loss for businesses and trucking companies. Congestion either causes late deliveries or forces truckers to build additional travel time into their itineraries, particularly when making *just-in-time* deliveries.

Congestion simply refers to a condition where traffic demand *exceeds* roadway capacity. Capacity measures potential or the maximum, sustainable rate of traffic volume that can traverse a road segment. Congestion results from sudden, significant changes in (1) traffic demand or (2) available roadway capacity, both of which cause demand to exceed capacity. When this occurs, the

congestion is considered either *recurring* or *non-recurring* based on its causal factors:

- **Recurring congestion** is usually characterized by an increase in traffic demand. Commuter traffic induces congestion at the same time and location weekday after weekday; hence traffic managers can essentially predict when recurring congestion will happen. Recurring congestion reflects the daily, systematic relationship between peak traffic demand rates, inadequate road capacity, and suboptimal operation of traffic control devices. The latter represents one of the few causes of recurring congestion that affects capacity rather than demand.

- **Non-recurring congestion** happens as a result of an event. The spatial and temporal characteristics, or location and time of an event, may be known in advance, or the event may happen at random with very little or no warning. These events are commonly termed *planned* and *unplanned* events, respectively. Congestion causing events, whether planned or unplanned, result in either a reduction in roadway capacity, an increase in traffic demand, or both. Table 1-1 summarizes how these events impact roadway system operations.

A planned special event represents the only type of event that can generate an increase in traffic demand *and* cause a temporary reduction in roadway capacity because of event staging. For example, a parade or bicycle race may require street closures extending over a significant distance, and other events may warrant isolated road closures to accommodate pedestrian flow.

Table 1-1
Congestion Impacts of Planned and Unplanned Events

EVENT CATEGORY		EVENT-GENERATED IMPACT	
		TRAFFIC DEMAND	ROAD CAPACITY
Planned Event	Major roadway construction and maintenance	• Increases background traffic demand on parallel freeways and arterials.	• Closes travel lane(s) or road segments.
	Planned special event	• Generates new trips and increases traffic demand on all corridors serving the event.	• Closes travel lane(s) or road segments to stage event (typically street use events).
Unplanned Event	Traffic incident (e.g., crash, disablement, spilled load, debris)	• Causes background traffic diversion to parallel freeways and streets.	• Blocks travel lane(s) or road segments.
	Emergency road work	• Causes background traffic diversion to parallel freeways and streets.	• Blocks travel lane(s) or road segments.
	Adverse weather (e.g., snow, ice, fog, heavy rain, sun glare)	• Decreases traffic demand (potentially).	• Reduces vehicle operating speeds and increases headways, thus reducing capacity.
	Emergency (e.g., severe weather, natural disaster, terrorism)	• Causes evacuations that generate extreme traffic demand.	• Renders road segments impassable (potentially).

Impact of Planned Special Events

Planned special events can significantly impact *travel safety*, *mobility*, and *travel time reliability*. Mobility and reliability refer to the ease and consistency of travel, respectively. The scope of these impacts represent a function of several event operation characteristics, including attendance, rate of event patron arrival and departure, venue location, and adjacent roadway capacity. The effect and perceived magnitude of mobility and travel time reliability impacts vary by class of transportation system user. Table 1-2 lists the classes of transportation system users whose needs must be accommodated during a planned special event.

Transportation stakeholders place a priority on minimizing impacts to event patron and non-attendee road users and to transit users as well. Event patrons accept a certain level of delay as part of the overall experience of attending an event, but place a high priority on getting to their destination prior to the event start.

Because planned special events are scheduled, transportation and other agencies attempt to influence the schedule to avoid conflict with recurring congestion. Some municipal codes prohibit special events requiring road closures at certain times of the day or week:

- For example, Section 447.50 of the Minneapolis Municipal Code states: *Downtown area restrictions. (a) No permit shall be granted for a parade/race to be conducted within the downtown area between the hours of 7:00 a.m. and 9:00 a.m. or 4:00 p.m. and 6:00 p.m. on any day which is not Saturday, Sunday, or a legal holiday.*

Table 1-2
Impacts on Transportation System Users

USER CLASS	USER TYPE	IMPACT ON USERS	USER RESPONSE
Event patron or participant	• Local resident • Visitor	• Event patron demand may cause roadway system congestion.	• Event patrons may use another mode of travel.
Non-attendee road user	• Local resident • Local business • Commuter • Trucker • Emergency services	• Commuters and truckers may encounter reduced travel time reliability in corridors serving an event venue. • Special event traffic control strategies may impact local residents and businesses not involved with the event. • Emergency service providers may experience increased response times during an event.	• Non-attendee road users may delay planned trips or divert around a corridor impacted by a planned special event. • Emergency service providers mandate the provision of unimpeded emergency access routes to and from the event venue and its surrounding area.
Transit user	• Bus • Commuter rail	• Transit users may realize service impacts on the day-of-event, including reduced availability of parking at transit stations and system capacity conditions.	• Preferred parking areas may be set aside for commuters during the days of the event.

GOALS OF MANAGING TRAVEL FOR PLANNED SPECIAL EVENTS

Table 1-3 presents the *goals* of managing travel for planned special events.

The potential impact a planned special event has on transportation system operations is often difficult to predict and measure. Periodic planned special events at stadiums and arenas, or similar venues having good access to adjacent high-capacity roadways, may generate highly predictable travel patterns known even by local commuters. But, in many other cases, the characteristics of a planned special event that define the level of event-generated trips, coupled with the event venue location and scope of available transportation system capacity, collectively may yield unpredictable impacts on travel without proper planning and analysis.

Operations, with safety an overarching criteria, during the event can improve transportation system efficiency of operation. With the foreknowledge of a planned special event and the early initiation of planning efforts, practitioners can achieve efficient transportation system operations even with the additional traffic generated at and adjacent to the event venue.

In meeting these goals, the mission of this technical reference involves disseminating a *suite* of travel management solutions, applicable on both a local and regional level, encompassing the following three broad strategies:

- **Process strategies** include frameworks for facilitating stakeholder coordination, steps for predicting event-generated travel demand and impacts, procedures for developing traffic management initiatives, methods for assessing event impact mitigation proposals, guidelines on implementation activities, protocol for communication, and frameworks for evaluation.
- **Operations strategies** include a range of regulations, traffic and pedestrian control strategies, and transit coordination strategies for operating the transportation system in a manner that fulfills the customer service requirements of event patrons and other road users during a planned special event.

Table 1-3
Planned Special Event Travel Management Goals

GOAL	TECHNIQUE
Achieving *Predictability*	• Perform a multi-modal travel forecast. • Define the area and transportation system components impacted. • Conduct analyses of parking demand and traffic demand. • Identify and correct roadway capacity deficiencies.
Ensuring *Safety*	• Accommodate pedestrians accessing an event via a network of safe walking routes. • Minimize pedestrian/vehicular conflicts. • Provide unimpeded access routes for emergency services. • Prevent congestion-induced secondary incidents.
Maximizing *Efficiency*	• Use all available resources and excess transportation system capacity, including road and transit capacity. • Enhance transportation system operations. • Deploy incident management strategies to respond and clear traffic incidents.

- **Service strategies** include travel demand management policies and other initiatives that strive to improve the utility associated with available travel choices (e.g., mode, vehicle occupancy, and parking destination).

This technical reference emphasizes the need to apply and integrate all possible solutions that benefit the safe and efficient management of travel for a single planned special event or a series of events occurring in a region. On a regional level, a committee on planned special events may adopt process and operations strategies disseminating standard operating procedures. Certain strategies, such as an express/charter bus service, may achieve greater public awareness and success if configured for a series of planned special events. Table 1-4 presents the objectives of this technical reference.

Table 1-4
Technical Reference Objectives

OBJECTIVE
• Describe innovative stakeholder partnerships that facilitate continuous coordination, cooperation, and integration of personnel and equipment resources. • Describe processes that stakeholders may adopt to improve current advance planning and day-of-event operations. • Provide methods to raise awareness of potential travel impacts to non-attendee road users and the community at-large. • Detail new technology applications and successful operations strategies to minimize field personnel requirements, improve travel conditions monitoring, and reduce congestion levels. • Identify the advantages of transit use, travel demand management, and accurate, up-to-date traveler information dissemination during the occurrence of a planned special event. • Demonstrate the importance of sound traffic management team organization and communication during the day-of-event. • Communicate the advantages of integrating post-event evaluation activities into program planning for future planned special events.

BENEFITS OF SUCCESSFUL PLANNED SPECIAL EVENTS

As shown in Figure 1-2, communities and regions have promoted and supported planned special events to boost tourism and fuel local and state economies. Examples include:

- The filming of "The Fast and the Furious 2," requiring extensive use of freeways and streets in Miami-Dade, Broward, and Palm Beach counties, brought an estimated $14 million to southeast Florida during the four-month filming.[2]
- The following economic benefits of planned special events were realized by the State of Wisconsin:[3]
  - $11 billion annual industry statewide.
  - $2.5 billion annual industry in metropolitan Milwaukee.
  - Over $1 billion generated in state tax revenues.
  - Over $70 million generated in Federal and state transportation revenues.

Figure 1-2
Community Promotion of Planned Special Events

Public agencies can enhance the image of their area by adopting a planned, coordinated, and integrated approach toward managing travel for planned special events that minimizes traffic congestion, maintains transportation system reliability, and exceeds the customer service expectations of all road users. These users include event patrons, commuters, truckers, and emergency service providers.

Table 1-5 presents the overall benefits that can be realized through managing travel for planned special events.

Table 1-5
Overall Benefits[4]

BENEFIT
• Reduced delay for motorists attending the planned special event through more active information dissemination, traffic management, and alternate mode use.
• Reduced delay for motorists not attending the special event through active promotion of alternate routes or modes.
• Reduced overall traffic demand at or near the special event site through active promotion of alternate routes or modes or dissemination of information, resulting in the cancellation or delay of unnecessary trips.
• Improved safety through more active traffic management and reduced motorist frustration.

The proactive and coordinated management of travel for planned special events also yields numerous benefits to transportation stakeholders and transportation system operations, as indicated in Table 1-6.

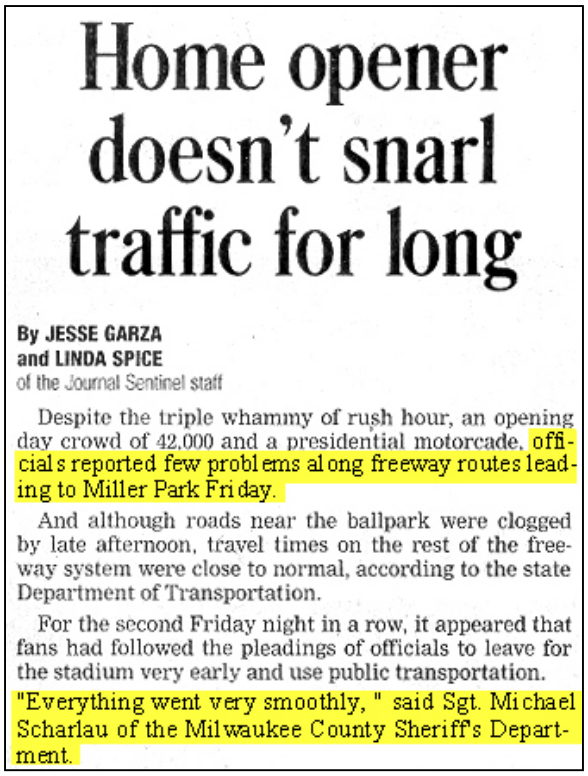
A successful planned special event also satisfies community residents and businesses possessing no direct interest in the event. Table 1-7 specifies community benefits.

Table 1-6
Benefits to Transportation Stakeholders and System Operations

BENEFIT
• Deployment of new technologies for traffic control and monitoring.
• Incorporation of new procedures and tactics into everyday traffic/incident management tasks.
• Upgrade of transportation system infrastructure.
• Improvement in stakeholder productivity.
• Promotion of interagency sharing of personnel and equipment resources.
• Leverage of public support for newly deployed traffic management and transit initiatives.
• Attraction of new regular transit users and carpoolers.
• Development of new interagency relationships crossing jurisdictional boundaries.
• Improvement in communication and trust between stakeholders.
• Coordination of and participation in regional organizations to influence policy and improve activities for all planned special events.
• Dissemination of lessons learned and solutions to technical problems that other jurisdictions may encounter in the future.
• Promotion of stakeholder efforts in the media, as illustrated in Figure 1-3.

Table 1-7
Community Benefits

BENEFIT
• Better community recognition.
• Increased pride and community spirit.
• Increased awareness of the community as a travel destination.
• Increased knowledge of potential for investment and commercial activity in the community.
• Increased potential to attract other special events.



Home opener doesn't snarl traffic for long

By JESSE GARZA
and LINDA SPICE
of the Journal Sentinel staff

Despite the triple whammy of rush hour, an opening day crowd of 42,000 and a presidential motorcade, officials reported few problems along freeway routes leading to Miller Park Friday.

And although roads near the ballpark were clogged by late afternoon, travel times on the rest of the freeway system were close to normal, according to the state Department of Transportation.

For the second Friday night in a row, it appeared that fans had followed the pleadings of officials to leave for the stadium very early and use public transportation.

"Everything went very smoothly," said Sgt. Michael Scharlau of the Milwaukee County Sheriff's Department.

Figure 1-3
Media Promotion of Stakeholder Efforts
(Graphic courtesy of the Wisconsin DOT.)

LITERATURE REVIEW

NCHRP Synthesis 309

A National Cooperative Highway Research Program (NCHRP) synthesis, *Transportation Planning and Management for Special Events*, reports on the state-of-the-practice of transportation-related activities associated with the planning and management of special events.[4] It identifies how agencies are planning, coordinating services, and managing transportation systems for planned special events. Based on a survey of stakeholder practices related to special event planning and management, the synthesis report addresses special event types, involved stakeholders, tools and techniques for managing travel demand and controlling traffic, operations guides, qualitative and quantitative assessment efforts, and funding sources.

FHWA Metropolitan ITS Infrastructure Deployment Tracking

The FHWA maintains an Intelligent Transportation Systems (ITS) deployment tracking database based on surveys of agencies in the 78 largest U.S. metropolitan areas and encompassing six ITS infrastructure component areas.[5] A survey on freeway management includes a select number of questions on special event management, including: (1) regional coordination for planned special events, (2) dissemination of information to the public via techniques such as the Internet, television, kiosks, and telephone information systems, and (3) transportation management center (TMC) operations. Below, survey responses for the Year 2002 are presented, summarizing the scope of regional special event planning and application of certain ITS system characteristics to special event traffic management.

<u>Regional Coordination for Planned Special Events</u>

- 68 percent of surveyed agencies (119 total) participate in a formal multi-agency initiative to proactively plan for and coordinate activities regionally related to special events. Of the agencies that participate in a formal multi-agency initiative:
  - 59 percent of surveyed agencies plan to document and coordinate activities, resources, and policies for all special events.
  - 36 percent of surveyed agencies have entered into an interagency agreement.
  - 64 percent of surveyed agencies participate in a multi-agency team.

- 73 percent of surveyed metropolitan areas (77 total) have agencies that participate in a formal multi-agency initiative to proactively plan for and coordinate activities regionally related to special events. Of the areas with agencies that participate in a formal multi-agency initiative:
  - 63 percent of surveyed metropolitan areas have agencies that plan to document and coordinate activities, resources, and policies for all special events.
  - 43 percent of surveyed metropolitan areas have interagency agreements.
  - 68 percent of surveyed metropolitan areas have multi-agency teams.

Dissemination of Information to the Public

- 43 percent of surveyed agencies distribute information on special events to the public.
- 49 percent of surveyed metropolitan areas have agencies that distribute information on special events to the public.

Transportation Management Center Operations

- 73 percent of surveyed agencies operate a TMC.
  - Of the agencies that operate a TMC, 84 percent indicate that special event traffic management represents a functional capability of their TMC.

- 78 percent of surveyed metropolitan areas have a TMC.
  - Of the metropolitan areas that have a TMC, 82 percent indicate that special event traffic management represents a functional capability of the TMC.

HANDBOOK OVERVIEW

Approach

This technical reference covers five phases of managing travel for planned special events. These phases, comprising the core chapters, include:

- **Program planning** encompasses advance planning activities completed months prior to a single, target event or activities related to a series of future planned special events. This level of advance planning involves the participation and coordination of stakeholders serving an oversight role in addition to agencies directly responsible for event planning and day-of-event traffic management.
- **Event operations planning** involves advance planning and resource coordination activities conducted for a specific planned special event. This phase involves stakeholders organized under the event planning team.
- **Implementation activities** represent a transition phase between event operations planning and day-of-event activities. The event planning team and traffic management team work to strategize traffic management plan deployment in addition to conducting necessary equipment testing and personnel training activities.
- **Day-of-event activities** refer to the daily implementation of the traffic management plan in addition to traffic monitoring. Rapid deployment of traffic management plan strategies and tactics, including contingency plans, requires a well-organized traffic management team and communications infrastructure.
- **Post-event activities** cover the evaluation of local and regional transportation operations based on stakeholder debrief-

ings and an analysis of traffic data collected during the day-of-event. Evaluation involves both the traffic management team and event planning team working together to identify successes and lessons learned, and the stakeholder groups may transfer their determinations to the oversight team for consideration and action under the program planning phase.

Table 1-8 describes common stakeholder-generated products under each phase of managing travel for planned special events. The table highlights corresponding major topics that the technical reference covers. Each of the handbook chapters describing a particular step in the sequential process of planning and managing a planned special event represents a stand-alone chapter. Yet, the technical reference provides a smooth transition from chapter to chapter and integrates the chapters through numerous references.

Intended Audience

The successful implementation of a transportation management plan for planned special events results in lessened traffic congestion and improved safety for event patrons and other transportation system users. Successful transportation management also maintains satisfactory mobility levels for residents and businesses in the vicinity of the event venue and preserves the overall reliability of the local and regional transportation system. Achieving this success requires the involvement of both transportation system operators and other stakeholders, representing various interests and disciplines, to meet the needs of the community and region. Three categories of stakeholders that may participate in the coordinated management of travel for planned special events include: (1) event operations stakeholders, (2) community interest stakeholders, and (3) event support stakeholders:

- **Event operations stakeholders** represent the *target audience* of this technical reference. These stakeholders collectively work toward predicting, mitigating, and measuring the safety, mobility, and reliability impacts of a planned special event on transportation operations through comprehensive advance planning, day-of-event traffic management, and evaluation and monitoring activities. A traffic operations agency, law enforcement agency, and event organizer represent core stakeholders because of the responsibility they bear in developing and implementing a transportation management plan. As with a traffic operations agency, law enforcement contributes to all phases of managing travel for planned special events and involves associated personnel at the administrative, management, and field operations level.

  Other key stakeholders include transit agencies and public safety agencies (e.g., fire and emergency medical service). Table 1-9 lists general responsibilities of event operations stakeholders. In many cases, an event predicted to generate significant travel demand across a region will necessitate the cooperation of *multiple* inter-jurisdictional stakeholders in the affected region.

- **Community interest stakeholders** ensure and review advance planning and operations activities to manage event-generated travel for the purpose of minimizing impacts on community quality of life and maximizing potential social and economic benefits. Non-transportation agencies and elected officials play an important role in

Table 1-8
Planned Special Event Management Phases and Key Tasks

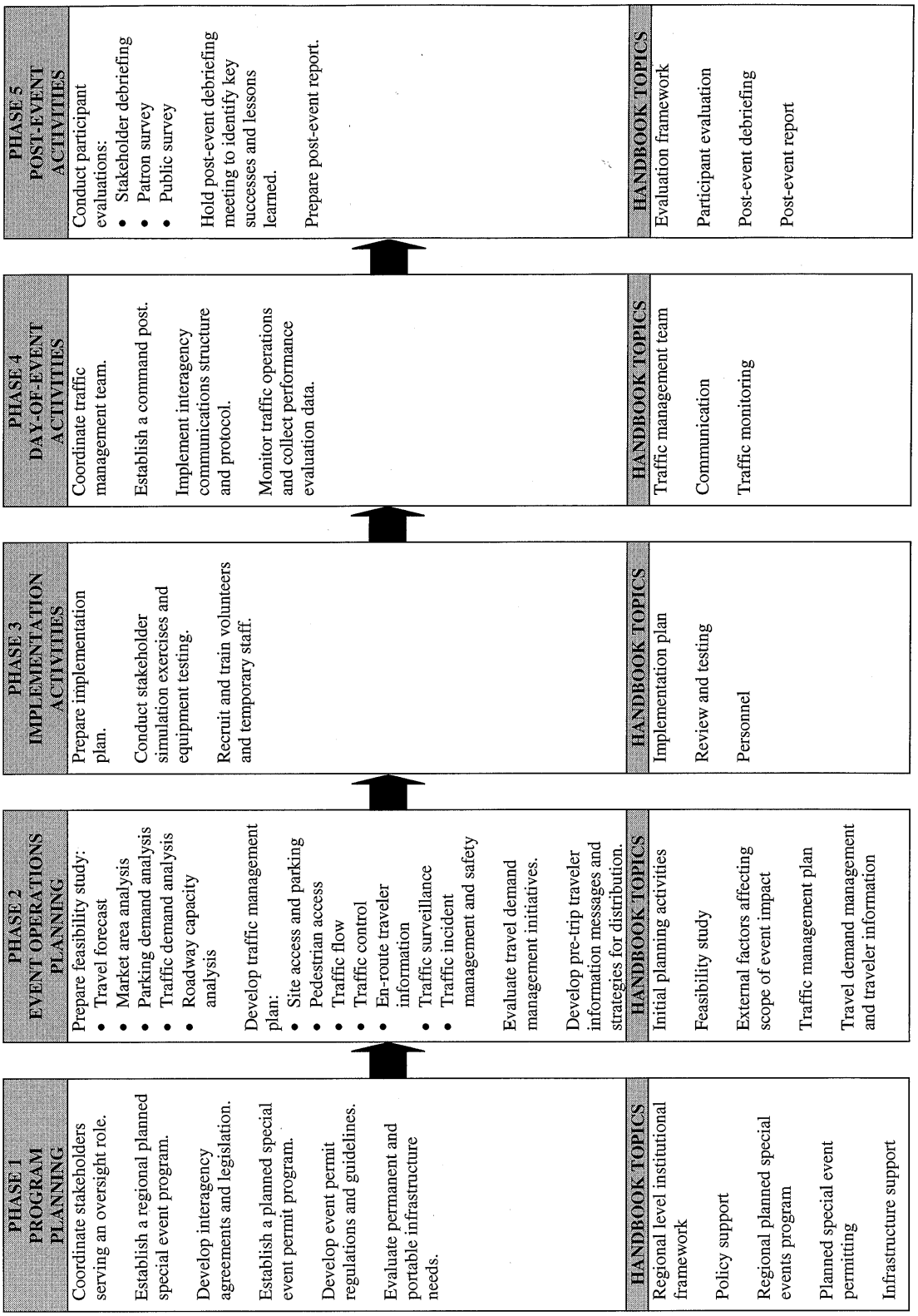


Table 1-9
Event Operations Stakeholders

STAKEHOLDER	RESPONSIBILITY
Traffic operations agency	• Operates and maintains the transportation system.
Transit agency	• Develops specialized transit plans, complementing an event traffic management plan, that detail schedules and necessary equipment and personnel resources.
Law enforcement	• Facilitates the safe and efficient flow of traffic through traffic control and enforcement.
Event organizer	• Plans the event operations logistics. • Funds the deployment of equipment and personnel resources, including reimbursement of public agency resource costs, required on the day-of-event. • Hires a private traffic engineering consultant to perform an event feasibility study and prepare a traffic management plan.
Public safety (e.g., fire and emergency medical service)	• Ensures adequate provision of emergency access routes to and from the event venue.

establishing policies, regulations, and initiatives for future planned special events. In fact, these agencies and officials may possess the authority to approve or disapprove a special event permit for an event organizer.

- **Event support stakeholders** support, execute, or adhere to the transportation management plan and initiatives proposed by event operations and community interest stakeholders. These stakeholders include private traffic control vendors, private towing companies, the general public, and automobile and trucking associations. Event support stakeholders and emergency service stakeholders may gain valuable insight on the development of event traffic management plan components, including contingency plans, in addition to strategies for reducing event-generated travel demand.

Organization

Overview of Chapters and Major Topics

This technical reference consists of 15 chapters, the final five of which detail and contrast advance planning and travel management activities for each of the five defined categories of planned special events discussed in Chapter 2.

Table 1-10 lists the technical reference chapters and indicates what chapters cover each distinct phase of special event management. The table shows Chapters 4 through 10, which represent the core chapters of the handbook, encompass all five phases of managing travel for planned special events.

To assist the reader in quickly navigating the handbook, each page displays a vertical toolbar that indicates the current chapter and section of the technical reference. As noted in Table 1-10, the sections include: (1) overview, (2) advance planning, (3) day-of-event activities, (4) post-event activities, and (5) event profile. Chapters designated under "event profile" discuss specific categories of special events, detail and contrast advance planning and travel management activities, and communicate recommended policies, guidelines, procedures, and resource applications in a user-friendly format tailored to a specific category of planned special event. In turn, readers can easily extract information and reference sample applications.

Table 1-10
Handbook Organization

SPECIAL EVENT MANAGEMENT PHASE	HANDBOOK CHAPTER	HANDBOOK SECTION
	Introduction	Overview
	Chapter 1 *Background*	
	Chapter 2 *Characteristics and Categories of Planned Special Events*	
	Chapter 3 *Overview*	
Program Planning	**Chapter 4** *Regional and Local Coordination*	Advance Planning
Event Operations Planning	**Chapter 5** *Event Operations Planning*	
	Chapter 6 *Traffic Management Plan*	
	Chapter 7 *Travel Demand Management and Traveler Information*	
Implementation Activities	**Chapter 8** *Implementation Activities*	
Day-of-Event Activities	**Chapter 9** *Day-of-Event Activities*	Day-of-Event Activities
Post-Event Activities	**Chapter 10** *Post-Event Activities*	Post-Event Activities
	Chapter 11 *Discrete/Recurring Event at a Permanent Venue*	Event Profile
	Chapter 12 *Continuous Event*	
	Chapter 13 *Street Use Event*	
	Chapter 14 *Regional/Multi-Venue Event*	
	Chapter 15 *Rural Event*	

User Application

By covering all phases of advance planning and management of travel for planned special events, this technical reference satisfies the information requirements of a wide range of stakeholders. Certain stakeholders may find the majority of handbook chapters pertain to their duties and responsibilities when handling a planned special event. Other stakeholders may only have interest in information disseminated via a few handbook sections. This technical reference recognizes three user groups, each of whom has an identifiable icon featured in the handbook. If a major chapter section contains topics suited to a particular user group, then the icon representing that group will appear on the same line as the section heading.

Three typical user groups, or event operations stakeholders, charged with managing travel for planned special events in jurisdictions across the country include: (1) transportation engineers, (2) law enforcement officers, and (3) event organizers. Table 1-

11 displays icons corresponding to each user group.

Table 1-11
Technical Reference User Groups

ICON	USER GROUP
	Transportation engineer
	Law enforcement officer
	Event organizer

The three user groups include:

- **Transportation engineers** include traffic engineers, transit officials, and transportation planners. Traffic engineers may lead event operations planning and day-of-event traffic management activities. Event operations planning activities may include developing and reviewing traffic management plans and formulating traffic signal system timing plans to accommodate anticipated fluctuations in traffic demand. Traffic engineers have a day-of-event responsibility of monitoring and maintaining traffic flow traversing their jurisdiction. Transit officials examine potential public transit incentives in addition to event express bus service. Transportation planners may administer a permit application for a local planned special event.

- **Law enforcement officers** may take responsibility for developing and executing a street traffic management plan. Other potential duties of law enforcement include traffic control and security on the day-of-event, enforcing traffic and parking restrictions, escorting dignitaries to/from the event venue, and enforcing the requirements of a traffic operations agency.

- **Event organizers** initiate the event operations planning phase by notifying stakeholders, through a written request to public agencies or the submission of an event permit application, and assembling an event planning team. The event organizer governs the logistics of the planned special event. The event organizer continually works to maintain interagency coordination in order to meet milestones in the advance planning process and ultimately gain stakeholder approval of the proposed transportation management plan.

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2. Kelleher, B., "Action on the Highways," *Transportation News*, Florida Department of Transportation, Vol. 36, No. 1, January 2003, p. 7.

3. Corbin, J., "Strategies to Improve Management of Travel for All Planned Special Events in a Region," Presented at the 82nd Annual Meeting of the Transportation Research

Board, Washington, D.C., January 12—16, 2003.

4. Carson, J.L. and R.G. Bylsma, *Transportation Planning and Management for Special Events*, NCHRP Synthesis 309, Transportation Research Board, National Research Council, Washington D.C., 2003, 71 pp.

5. "ITS Deployment Tracking", U.S. Department of Transportation, Washington, D.C., 2003 [Online]. Available: http://itsdeployment2.ed.ornl.gov/its2002/default.asp. [2003, September 10].

CHAPTER TWO
CHARACTERISTICS AND CATEGORIES OF PLANNED SPECIAL EVENTS

Figure 2-1
Event Traffic Management *(Photo courtesy of the Wisconsin DOT.)*

PURPOSE

This chapter presents planned special event operations characteristics and associated factors defining the scope of event impact on transportation system operations. It describes *planned special event classification* in terms of event categories and event impact level. This chapter also introduces the *stakeholder groups* organized under the various phases of managing travel for planned special events.

PLANNED SPECIAL EVENT CLASSIFICATION

Characteristics

A planned special event impacts the transportation system by generating an increase in travel demand in addition to possibly causing a reduction in roadway capacity because of event staging. The first step toward achieving an accurate prediction of event-generated travel demand and potential transportation system capacity constraints involves gaining an understanding of the event

characteristics and how these characteristics affect transportation operations. In turn, practitioners can classify the planned special event in order to draw comparisons between the subject event and similar historical events to shape travel forecasts and gauge transportation impacts.

Figure 2-2 shows typical operational characteristics of a planned special event. Each characteristic represents a variable that greatly influences the scope of event operation and its potential impact on the transportation system. These variables include:

- **Event time of occurrence** defines the time of day(s) the event is *open for business*, a key variable when comparing event-generated traffic to background traffic.
  - For example, weekday events may face constraints on roadway, transit, and parking capacity because of commuter travel.

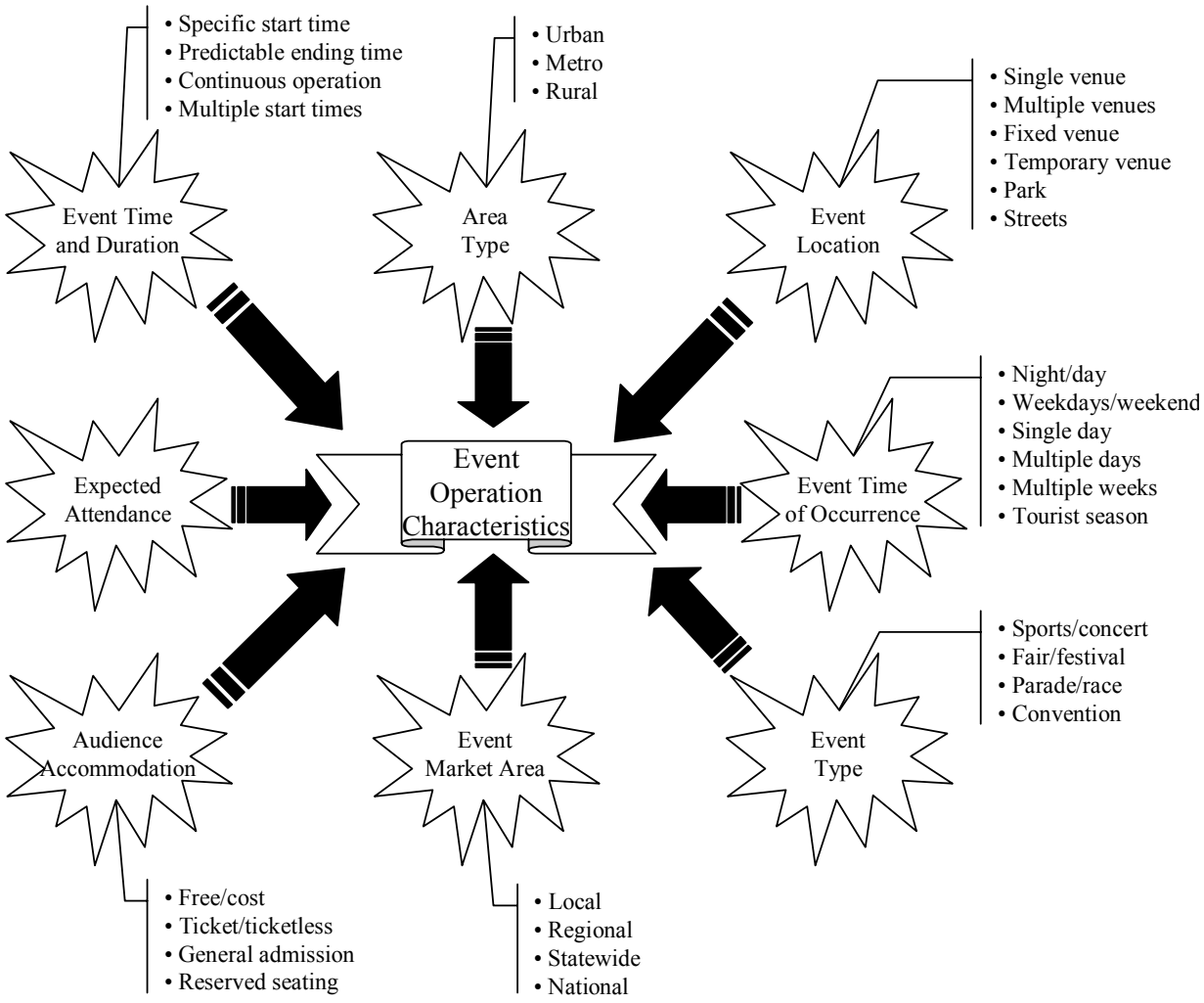

Figure 2-2
Event Operation Characteristics

- **Event time and duration** defines whether the event features a specific main event start time, likely to condense event patron arrival, or operates continuously throughout the day where patrons may freely come and go.

- **Event location** defines the characteristics of the venue(s) location and connection to the existing transportation infrastructure.
  - Typically, fixed venues, such as stadiums or arenas, feature high-capacity parking areas adjacent to the venue and good access to/from adjacent freeways and principal arterial streets.
  - Temporary venues may lack these features, thus requiring the development of a detailed site access and parking plan.

- **Area type** defines the scope of available transportation services, the characteristics of background traffic traversing the area, and the various stakeholders that may become involved in event planning and management. These characteristics influence the event operations planning process and day-of-event travel management, yet significantly vary across rural, urban, and metropolitan areas.

- **Event market area** defines the area from where event patrons originate and the scope of event exposure.
  - For example, the Summerfest music festival in downtown Milwaukee drew over one million in attendance over eleven days in 2002. Demographic surveys indicated 56 percent of Summerfest patrons lived in the four counties comprising the greater metropolitan Milwaukee area, 22 percent of patrons lived in other areas of Wisconsin, and 22 percent of patrons lived outside Wisconsin.[1] The event clearly had a regional/statewide market area.
  - Political conventions or major industry exhibitions feature a national scope where the majority of attendees do not reside in the host city.

- **Expected attendance** defines the maximum, estimated number of event patrons.
  - Attendance estimates may include the anticipated number of VIPs, advance ticket holders, patrons with an assigned parking pass, and patrons requiring special assistance.
  - With regard to sporting events, key components in estimating attendance involve home team performance and visiting team attraction.
  - Games involving high-profile visiting teams or performers may sell-out far in advance of the event, allowing stakeholders sufficient notice to take appropriate measures.
  - Attendance impacts traffic operations in the immediate vicinity of the event venue depending on the access and parking capacity furnished at the venue.

- **Audience accommodation** defines the potential to predict the number and origins of event-generated trips in addition to the type of trip patrons may make to the venue.
  - Attendance at free events is hard to predict and may vary considerably based on weather conditions and other factors on the day-of-event.
  - Events featuring advance ticket sales and reserved seating may decrease the number of event patrons making

a spur-of-the-moment decision to attend an event.

- **Event type** defines the type of event that may be subject to special regulations and permit requirements. The event type includes many of the previously defined characteristics of planned special events that influence event-generated travel demand and level of impact on the transportation system. Event planners may refer to event type when researching impacts on travel caused by similar events.

Categories

The event operation characteristics described in the previous section create five categories of planned special events, listed in Table 2-1.

Table 2-1
Categories of Planned Special Events

SPECIAL EVENT CATEGORY
• Discrete/recurring event at a permanent venue
• Continuous event
• Street use event
• Regional/multi-venue event
• Rural event

Table 2-2 contrasts some general characteristics specific to each defined event category. Figure 2-3 illustrates events representing four event categories. The fifth category, regional/multi-venue event, includes any combination of the first three event categories listed in Table 2-1.

This technical reference makes exclusive reference to the defined categories of planned special events when referencing or profiling particular event types. In recognizing the unique characteristics of each category of planned special event regarding trip generation and event impact on transportation system operations, many jurisdictions across the country have developed distinct planning processes, policies, and regulations specific to particular event categories. The balance of this section describes each of the five defined event categories.

Discrete/Recurring Event at a Permanent Venue

A discrete/recurring event at a permanent venue occurs on a regular basis, and it has a specific starting time and predictable ending time. Events classified under this category have predictable peak arrival and departure rates relative to other categories of planned special events. These events generate high peak travel demand rates because of patron urgency to arrive at the venue by a specific event start time. Moreover, these events end abruptly upon game time expiration or the conclusion of a final song, which creates high peak departure rates.

Stadiums and arenas occasionally host weeknight events that may conflict with commuter traffic, especially if media broadcasting the event mandates a specific start time. For instance, a Monday Night Football game held in San Diego, San Francisco, Oakland, or Seattle usually begins at 6:00 p.m. Pacific time to satisfy television broadcast requirements.

Continuous Event

A continuous event occurs over a single or multiple days. Unlike a discrete/recurring event at a permanent venue, continuous events do not exhibit sharp peak arrival and peak departure rates. Event patrons typically arrive and depart throughout the event day.

Aside from conventions and state/county fairs, many continuous events take place at a temporary venue, a park, or other large open

Table 2-2
Characteristics of Different Planned Special Event Categories

CHARACTERISTIC	PLANNED SPECIAL EVENT CATEGORY
	Discrete/Recurring Event at a Permanent Venue
Event Location	• Fixed venue
Event Time of Occurrence	• Single day; Night/day; Weekday/weekend
Event Time and Duration	• Specific start time; Predictable ending time
Area Type	• Metro; Urban
Event Market Area	• Local; Regional; Statewide; National
Expected Audience	• Known venue capacity
Audience Accommodation	• Cost; Ticket; Reserved seating; General admission
Event Type	• Sporting and concert events at stadiums, arenas, and amphitheaters.
	Continuous Event
Event Location	• Temporary venue; Park; Fixed venue
Event Time of Occurrence	• Single/multiple days; Weekends; Multiple weeks
Event Time and Duration	• Continuous operation
Area Type	• Metro; Urban
Event Market Area	• Local; Regional
Expected Audience	• Capacity of venue not always known
Audience Accommodation	• Free/cost; Ticket/ticketless; General admission
Event Type	• Fairs; Festivals; Conventions/expos; Air/automobile shows
	Street Use Event
Event Location	• Streets
Event Time of Occurrence	• Single day; Weekends
Event Time and Duration	• Specific start time; Predicable ending time
Area Type	• Metro; Urban; Rural
Event Market Area	• Local; Regional
Expected Audience	• Capacity generally not known
Audience Accommodation	• Free; Ticketless
Event Type	• Parades; Marathons; Bicycle races; Motorcycle rallies; Grand Prix auto races; Dignitary motorcade
	Regional/Multi-Venue Event
Event Location	• (Multiple) Fixed venue; Temporary venue; Streets
Event Time of Occurrence	• Single/multiple days; Weekends
Event Time and Duration	• Specific start time; Predictable ending time; Continuous operation
Area Type	• Metro (typically); Urban; Rural
Event Market Area	• Local; Regional; Statewide; National
Expected Audience	• Overall capacity generally not known if continuous events or street use events involved
Audience Accommodation	• Free/cost; Ticket/ticketless
Event Type	• Sporting games; Fireworks displays; Multiple planned special events within a region that occur at or near the same time
	Rural Event
Event Location	• Fixed venue; Temporary venue; Park
Event Time of Occurrence	• Single/multiple days; Weekends; Tourist season
Event Time and Duration	• Specific start time; Predictable ending time; Continuous operation
Area Type	• Rural
Event Market Area	• Local; Regional
Expected Audience	• Capacity of venue not always known
Audience Accommodation	• Free/cost; Ticket/ticketless
Event Type	• Discrete/recurring event; Continuous event

Figure 2-3
Examples of Planned Special Events

space. As a result, roadway and parking capacity issues may arise in the immediate area surrounding a temporary venue. Temporary venues may not have a defined spectator capacity, thus creating uncertainties in forecasting event-generated trips since a "sell-out" cap does not exist.

Street Use Event

A street use event occurs on a street requiring temporary closure. These events generally occur in a city or town central business district; however, race events or motorcycle rallies may necessitate temporary closure of arterial streets or limited-access highways.

A street use event significantly impacts businesses and neighborhoods adjacent to the event site from the perspective of parking and access. A street use event closes a segment(s) of the roadway network and causes background and event traffic to divert onto alternate routes, thus increasing traffic demand on other streets in the roadway network.

Filming activities may require the closure of major roadways for an extended duration, but stakeholders can work with production companies on day-of-the-week scheduling.

Regional/Multi-Venue Event

A regional/multi-venue event refers to multiple planned special events that occur within a region at or near the same time. The collection of events may have different starting times and differ in classification category. For instance:

- On August 31, 2002, downtown Denver hosted the Grand Prix of Denver (attendance 20,000), the Taste of Colorado festival (attendance 150,000), and a college football game (attendance 76,000).[(2)] Grand Prix races and the Taste of Colorado also occurred simultaneously on two other days of Labor Day weekend 2002.
- Major fireworks displays warrant consideration under this event category since large crowds may spread out over a large area depending on the number of good vantage points available.
- The lack of overflow parking and roadway congestion represents some of the key concerns when planning for multiple events occurring within a small area.

A number of major metropolitan areas have two or more adjacent fixed venues or venues utilizing the same freeway corridor. Multiple venues may occasionally host events on the same day.

- Figure 2-4 illustrates an example of a regional/multi-venue event that occurred in Anaheim, CA. The Anaheim Angels baseball team hosted a playoff game at Edison Field, and the Mighty Ducks of Anaheim hockey team played against a high-attendance drawing team from Detroit at the Arrowhead Pond, located on the opposite side of State Route 57 and Katella Avenue from Edison Field. Both events sold-out, but the baseball game had been scheduled only days before its occurrence due to the baseball playoff system. Broadcast media likely required the game start time of 1:05 p.m. As a result, high departure rates from Edison Field and high arrival rates to Arrowhead Pond occurred at approximately the same time.
- Although special circumstances surrounded the above example event, stakeholders managing all planned special events within a region emphasize coordination of event times to reduce peak parking demand and impact on transportation system operations.

Rural Event

Rural events encompass any discrete/recurring event or continuous event occurring in a rural area. Planned special events occurring in rural areas deserve a stand-alone classification category for several reasons:

- Need for stakeholders to assume new and/or expanded roles.
- Existence of limited road capacity to access the event venue and potentially limited parking capacity at the venue.
- Existence of fewer alternate routes to accommodate event and background traffic.
- Lack of regular transit service and hotels near the venue.
- Existence of limited or no permanent infrastructure for monitoring and managing traffic.

Impact Level

Stakeholders responsible for planning and managing travel for planned special events must gauge the potential severity of a planned special event. Agencies must determine with certainty *if* a planned special event will affect or impede the normal flow

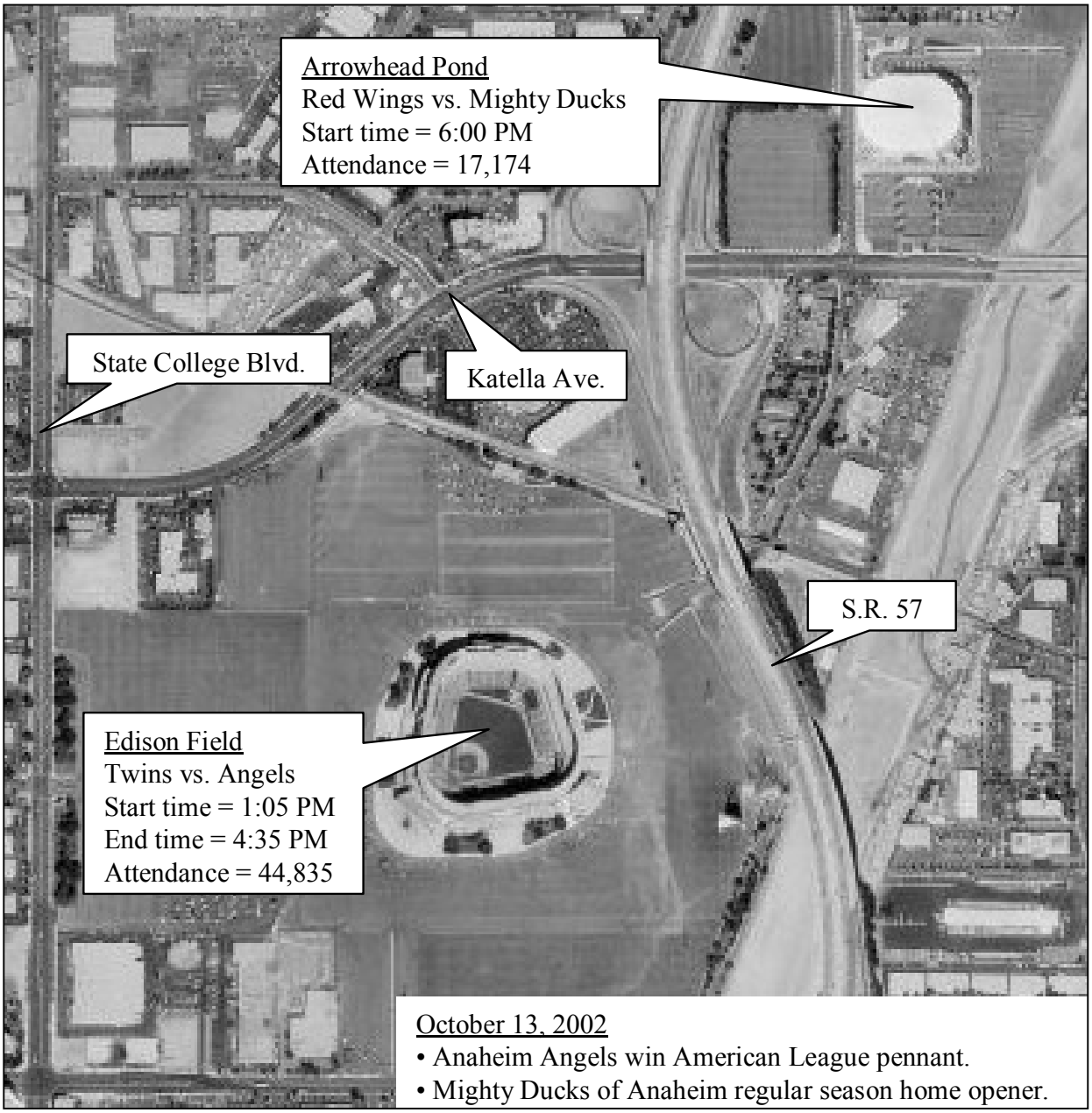

Figure 2-4
Example Regional/Multi-Venue Event

of traffic and if yes, *how much* impact will the event have. Answers to these questions determine the scope of the transportation management plan required to mitigate event-generated impacts on travel in addition to the number of stakeholders that become involved in advance planning and day-of-event travel management activities.

Example Incident Management Protocol

The stakeholders and resources involved in traffic incident management and managing travel for planned special events overlap. The following examples of classifying a planned special event under a traffic incident severity level illustrate how traffic incident

responders determine the resources and level of effort required to manage traffic during a planned special event:

- A new chapter included in the proposed amendments to the 2000 Manual on Uniform Traffic Control Devices (MUTCD), entitled "Control of Traffic Through Traffic Incident Management Areas," defines an incident as follows:[3]

  A traffic incident is an emergency road user occurrence, a natural disaster, or a special event that affects or impedes the normal flow of traffic.

  The proposed MUTCD amendment classifies traffic incident severity by duration of incident. Incident classification levels include:

  - Major – expected duration of more than 2 hours;
  - Intermediate – expected duration of 30 minutes to 2 hours; and
  - Minor – expected duration under 30 minutes.

  Planned special events having a duration of two hours fall within the classification of "major incident."

- The Colorado Department of Transportation (DOT) – Region 6 maintains the following criteria for classifying a planned special event as a Level III Modified Incident, the highest Region 6 traffic incident severity level: *special or planned events that have major impacts*.[4]

Planned Special Event Severity

It is important to recognize that the impact of a planned special event on traffic and transit operations depends on a combination of several dynamic factors. Collectively, planned special event impact factors differ from those considered in determining the severity of other types of planned and unplanned events.

As illustrated in Figure 2-5, the three core factors include travel demand, road/site capacity, and event operation. Available resources and external factors represent secondary aspects that also affect the impact a planned special event has on transportation system operations. Key considerations include:

- **Travel demand** refers to the expected number of event patrons and their arrival and departure rates. Modal split has a significant influence on the level of event impact, particularly on traffic operations. Event patrons may travel to the event via personal vehicle, transit, walking, or a combination of modes. A planned special event travel forecast involves estimating travel demand magnitude, travel demand rate, and modal split.

- **Road/site capacity** concerns the available venue access and parking *background capacity* in addition to the capacity of roadways and transit serving the event venue. Capacity must take into account: (1) background parking occupancy in parking areas serving the event venue and (2) volume of background traffic that normally traverses the road system serving the event venue. Capacity influences travel demand to a limited extent, as "seasoned" event patrons in some locales may choose to use transit to access an event venue, because of severe traffic congestion experienced in the past, although they may not represent regular transit users.

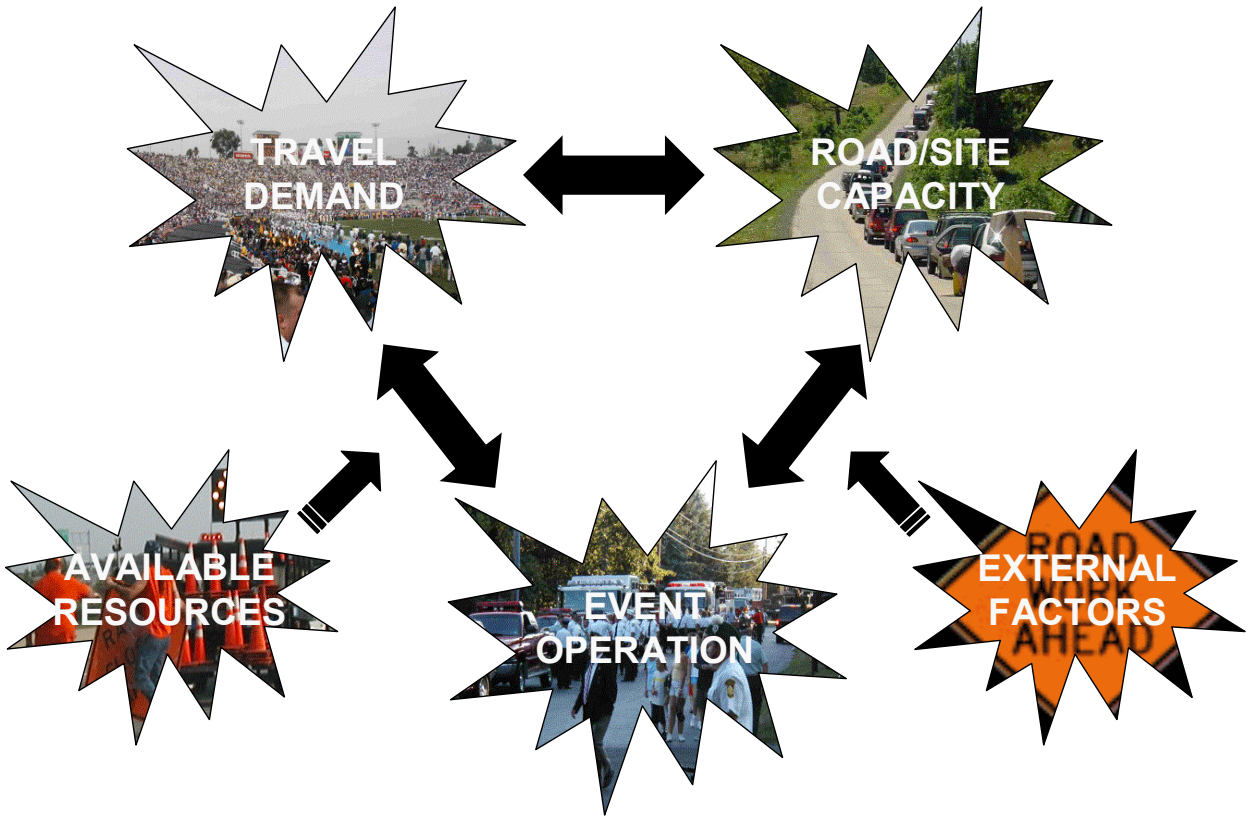

Figure 2-5
Planned Special Event Impact Factors

- **Event operation** essentially defines the scope of travel demand, including market area, and may reduce available background capacity because of event staging requirements. Event operations impact the effect a planned special event has on travel. For instance:
  - A venue may open earlier to better spread the rate of arrivals for a concert or sporting game.
  - Event patrons may be given special advance instruction on specific parking options.
  - An event organizer may relocate an event to a different venue when roadway capacity deficiencies can not be adequately mitigated.
  - On the other extreme, corporate hospitality tents at the 2003 Super Bowl in San Diego reduced the amount of available on-site parking from 19,600 spaces to 3,400 spaces.[5]

- **Available resources** refer to the quantity of personnel and equipment available to plan for and conduct day-of-event travel management operations. The occurrence of regional/multi-venue events or other unplanned events may strain available stakeholder resources needed to manage a particular planned special event.

- **External factors** include concurrent roadway construction activities on roadway corridors serving a venue and prevailing weather conditions on the day-of-event. Weather conditions have a significant impact on attendance (e.g.,

travel demand) or the rate of arrivals and departures at some events. For example:

- Event patrons will attend an open-air sporting event in extremely hot weather, but patrons may bypass arriving at the venue early to tailgate, thus concentrating patron arrivals.
- Rain events may flood unpaved parking lots and venue access roads, rendering them impassable and reducing available road/site capacity. Rain events may also cause sharp arrival and departure rates in addition to safety problems.

When determining the level of impact each of the five stated planned special event factors has on travel, consider each of the following components:

- Duration – temporal impact.
- Extent – spatial impact or scope of area affected.
- Intensity – volume of impact.

Planned Special Event Impact Classification

Jurisdictions have established defined planned special event impact classification levels for the purpose of determining: (1) event permit requirements, (2) transportation management plan deployment, and (3) scope of potential impact on the transportation system.

The balance of this section summarizes various frameworks, based on a range of event impact factors and thresholds, applied to estimate the severity level of a particular planned special event for advance planning purposes.

Event Permit Requirements

A number of communities with planned special event permit guidelines have also developed criteria to categorize various sizes of planned special events. As a result, one proposed special event may have to meet more stringent permitting requirements than other events based on its severity classification. Decision criteria include expected attendance and scope of street closure.

The following examples summarize the permit classification standards of several jurisdictions, and the collective category thresholds specific to each jurisdiction vary by jurisdiction population:

- Alpine County, CA (pop. 1,208) specifies three planned special event category sizes:
  - Minor event – 75-100 people.
  - Mid-size event – 101-500 people.
  - Major Event – 501+ people: requires public hearing with the Alpine County Planning Commission.

- West Sacramento, CA (pop. 31,615) maintains three planned special event category sizes:
  - Category 1 event – 50 to 499 people.
  - Category 2 event – 500 to 2,999 people.
  - Category 3 event – 3,000 or more people: requires major police support and traffic control.

- Louisville, KY (pop. 256,231) specifies three planned special event category sizes:
  - Small Event – maximum peak attendance of 500 people or less.
  - Special Event – maximum peak attendance of more than 500 and less than 5,000 people.
  - Major Event – maximum peak attendance of 5,000 or more people.

- Clarksville, TN (pop. 103,455) states a "minor event" must meet the following

transportation impact criteria: (1) event must last no longer than one day and (2) street closures will be less than four hours and limited in scope.

- Palo Alto, CA (pop. 58,598) developed three street use event impact classifications based on the spatial characteristics of proposed street closures. The street use event categories are:
  - Class A – A celebration, parade, local special event, festival, meeting, procession, concert, rally, march, or any similar occurrence which exceeds one city block in length or obstructs more than one intersection, whether or not such occurrence is moving.
  - Class B – A Class A closure or a block party of any similar occurrence not exceeding one city block or one intersection on other than arterial or collector streets, and along which at least two-thirds of the area is in a residential zone.
  - Class C – A local special event or similar occurrence involving the display, exhibition, advertisement, or sale of merchandise, etc., upon a portion of the public sidewalk. Cannot exceed 50% of width of sidewalk.

Venue Transportation Management Plan Deployment

Stakeholders often develop transportation management plans specific to a permanent venue, such as a stadium, arena, or amphitheater. Development of site access and parking plans usually occur during venue construction. Transportation agencies and law enforcement may develop traffic control plans, based on a generic or recurring event, for managing transportation operations on streets adjacent to the venue and/or corridors serving the venue during future planned special events. These *program planning* activities do not focus on a single, known planned special event. Therefore, stakeholders must establish transportation management plan deployment thresholds to ensure availability and placement of adequate resources to maintain satisfactory site and transportation operations during any future planned special event occurring at the venue.

- The parking and transportation management plan for Investco Field in Denver contains separate traffic management and operations plans, categorized under four attendance scenarios, for future planned special events occurring at the venue:[6]
  - Sold-out Denver Broncos (football) games.
  - Other large events with an attendance of more than 60,000.
  - Medium events with an attendance between 40,000 and 59,000.
  - Small events with an attendance between 20,000 and 39,000.

  The traffic management and operations plans for each scenario vary based on: (1) event patron modal split prediction, (2) site parking lot usage, (3) Investco Field transit service, and (4) level of personnel and equipment resources for traffic control in the vicinity of Investco Field.

Regional Traffic Operations Impact Level

The State of Wisconsin and the City of Los Angeles assign event impact levels for a proposed planned special event:

- The organization of the Traffic Incident Management Enhancement (TIME) program in southeastern Wisconsin includes a 40-plus agency Freeway Incident Management Team responsible for pro-

viding technical guidance toward TIME implementation. This group maintains a subcommittee on special events. The special events subcommittee proposed a concept of creating a special event traffic management planning tool applicable to any planned special event proposed in the greater Milwaukee metropolitan area. The tool proves particularly useful for assessing the required multi-agency response to a planned special event proposed with relatively brief advance notice. Based on the input of information related to the previously described five event impact factors, the tool assigns one of five event impact levels to a proposed event. The following numerical thresholds define the five event impact levels:

- Traffic Condition Level 1 = 15
- Traffic Condition Level 2 = 25
- Traffic Condition Level 3 = 35
- Traffic Condition Level 4 = 45
- Traffic Condition Level 5 = 65

Figure 2-6 shows a draft version of the planning tool, including the numerical values assigned to each event impact factor answer. TIME stakeholders plan to develop an action plan corresponding to each identified planned special event level. The action plan will list recommended practices for stakeholders that regularly manage traffic during the occurrence of a planned special event, including the Wisconsin DOT – District 2, county highway departments, law enforcement, and event venue personnel. These recommended practices would detail required staffing levels, on-call equipment, alternate route usage, traffic signal system modifications, available transit options, and other information.(7)

- The City of Los Angeles DOT (LADOT) and Los Angeles Police Department (LAPD) maintain a database of planned special events scheduled to occur within the agencies' jurisdiction. The LADOT and LAPD assign an event impact level to each event to describe the general scope of each agency's involvement in advance planning and day-of-event traffic management. The event impact levels include:
  - Level 1: Install and enforce temporary parking restrictions.
  - Level 2: Level 1 and deployment of traffic officers (LAPD).
  - Level 3: Level 2 and engineering/ATSAC support (LADOT).
  - Level 4: Coordinated major event response effort.

  ATSAC refers to LADOT's Automated Traffic Surveillance and Control System. Initially deployed for the 1984 Summer Olympic Games, ATSAC is a computer traffic signal system that monitors traffic conditions and system performance, selects appropriate traffic signal timing strategies, and performs equipment diagnostics and alert functions. Operators at the ATSAC Operations Center receive real-time information from signalized intersection detectors and signal controllers, and operators have access to closed-circuit television images at critical locations throughout the City.(8)

STAKEHOLDER GROUPS

Transportation system performance during a planned special event affects numerous stakeholders. Achieving seamless and efficient transportation operations between freeways, streets, parking facilities, and transit serving a special event venue requires a sound multidisciplinary, inter-jurisdictional, and inter-modal approach. The organization and coordination of

Special Event Traffic Management Planning Tool

Instructions: Determine what level of traffic will be experienced by answering the following questions to the best of your ability. Please place an "x" in the white box below the appropriate answer.

What is the predicted special event attendance?	Under 20, 000	20,000 - 30,000	30,000 - 40,000	40,000 - 60,000	over 60,000	
Bradley Center holds 18,000 - 20,000 Miller Park holds 42,000 For more attendance information contact the TOC.	0	2	4	8	12	ENTER - PLEASE SELECT ONLY
Does the event mandate lane or ramp closures?	No	Single Closure	Multiple Closures	Full Freeway Closure	Freeway Closure and Additional Closures	
Are any ramps, lanes, arterials, or freeways closed to accomodate a special event?	0	2	8	12	16	ENTER - PLEASE SELECT ONLY
What is the effect of construction on traffic?	not applicable	some impact	moderate impact	considerable impact	severe impact	
Is there a construction project on any of the corridors leading to or away from the special event venue? Are there any lane closures?	0	2	4	6	10	ENTER - PLEASE SELECT ONLY
Where is the event?	Downtown Milwaukee	Within the City of Milwaukee	Within Milwaukee County	Metro Milwaukee	Southeastern Wisconsin	
If there is more than one event, choose the location closest to downtown Milwaukee.	8	6	4	2	1	ENTER - PLEASE SELECT ONLY
What effect does the event scheduling have on traffic?	no impact	some impact	moderate impact	considerable impact	severe impact	
Is the event scheduled to begin or end during a peak period? Is there more than one event beginning or ending at the same time?	0	2	4	6	12	ENTER - PLEASE SELECT ONLY
Is there transit service to the event?	dedicated route/adequate service	dedicated route/limited service	local service	no service		
	0	2	6	10		ENTER - PLEASE SELECT ONLY
Will a VIP be attending?	No	Local	State	National or International	National or International and the President	
	0	0	2	8	10	ENTER - PLEASE SELECT ONLY
Is there an incident going on affecting the situation?	no impact	some impact	moderate impact	considerable impact	severe impact	
Is there an incident on or near a corridor to the special event? Are there lane closures because of the incident?	0	2	4	6	10	ENTER - PLEASE SELECT ONLY
What are the weather conditions?	Clear	Mild	Moderate	Severe - Summer	Severe - Winter	
Is there a forecast for severe weather before, during, or after the special event that might effect traffic?	0	1	2	6	10	ENTER - PLEASE SELECT ONLY
Are all human resources available?	Yes	Most	Some	Few	None	
Is the event scheduled to begin and end during normal working hours? Are key individuals available if needed?	0	1	2	3	4	ENTER - PLEASE SELECT ONLY
Is all equipment available?	Yes	Most	Some	Little	None	
Are all facilities available? Is communication equipment working? Is all traffic control equipment available?	0	1	2	3	4	ENTER - PLEASE SELECT ONLY

0

TRAFFIC CONDITION: LEVEL 1

Figure 2-6
Wisconsin TIME program Special Event Traffic Management Planning Tool
(Graphic courtesy of the Wisconsin DOT.)

planned special event stakeholders is paramount to meeting the goals of planned special event management: achieving predictability, ensuring safety, and maximizing efficiency. Steps toward meeting this objective begin in the advance planning of traffic management plans and other initiatives and continues through implementation and day-of-event travel management.

Planned special events can involve a wide range of stakeholders with diverse goals and incentives. One of the biggest challenges to consistently achieving effective planned special event management is coordinating and integrating the responses of all involved stakeholders, each with responsibility to serve the public, but with sometimes divergent priorities and performance objectives. Each stakeholder has its own norms, guidelines, sense of authority, and internal culture. The involvement of multiple stakeholders can threaten the sense of security and authority of each, causing such groups to unconsciously de-emphasize the public good each has set out to serve.(9) As a result, the objectives of the collective stakeholder group are left unfulfilled.

Several stakeholders active in the advance planning and management of planned special events also team to mitigate the occurrence of unplanned events, such as traffic incidents and other emergencies, through proactive planning and response. These stakeholders include transportation agencies, law enforcement, and emergency service agencies. It should be recognized that the roles and responsibilities of stakeholders involved in managing unplanned events change under planned special events. However, the important partnerships and level of trust established between stakeholders carry over to groups formed to plan and manage planned special events.

Figure 2-7 shows that advance planning and day-of-event management of travel for planned special events involves stakeholders comprising the following three distinct groups:

- The **oversight team** involves stakeholders participating in program planning activities to improve the management of travel during future planned special events. These stakeholders include mid-to-upper level representatives of transportation agencies and law enforcement. Additional stakeholders include elected officials, regional organizations, and other government agencies. Members of an oversight team work to establish policies, regulations, procedures, and task forces for future application to a specific planned special event. Team members may interact with an event planning team, consulting on feasibility study results and evaluating conceptual transportation management plan components. Stakeholders may also work independent of the team to evaluate potential new technology applications that may improve their performance and capabilities while meeting team objectives.

- The **event planning team** involves stakeholders participating in event-specific operations planning and traffic management plan implementation tasks. Stakeholders comprising the oversight team typically have mid-level representatives serving on the event planning team. Other stakeholders include the event organizer, media, emergency service agencies, private industry, and the public. Due to the wide range of advance planning tasks and potential event management initiatives, an event planning team may create a number of

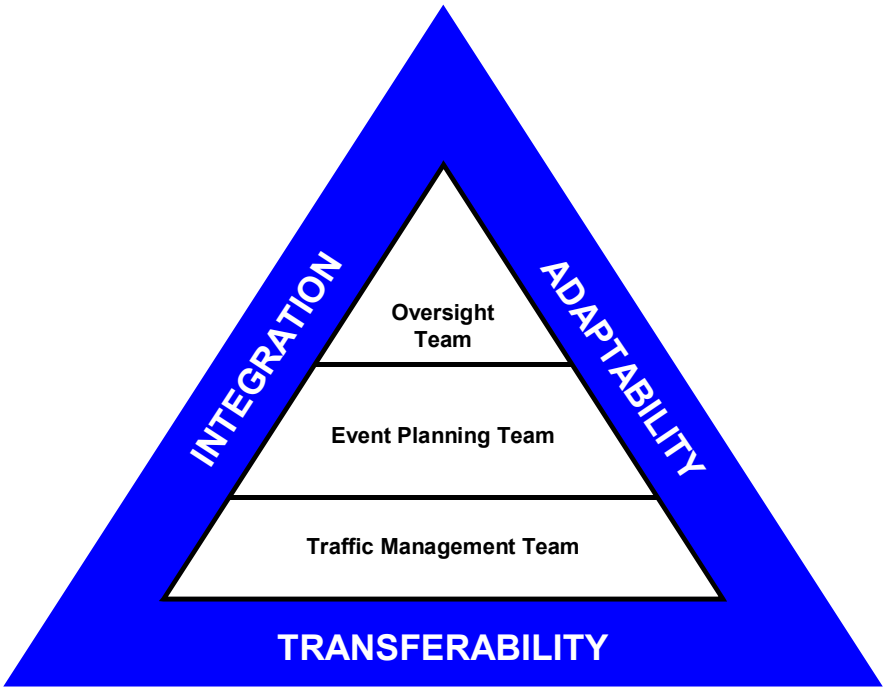

Figure 2-7
Planned Special Event Stakeholder Groups

satellite task forces. Example task forces include a communications subcommittee or task force on evaluating potential travel demand management strategies.

- The **traffic management team** involves stakeholders responsible for managing travel on the day-of-event. These stakeholders include operations managers and field personnel representing transportation agencies, law enforcement, the event organizer, media, and private industry. An event traffic management team typically interacts with the event planning team during implementation activities. The traffic management team may also debrief the oversight team and event planning team during post-event evaluation activities.

Major annual event or venue task forces exist in some jurisdictions that serve the role of both an oversight team and event planning team. The task force may meet year-round to mitigate lessons learned from past events, then expand to include additional event operations stakeholders as the next event nears.

The success of each identified stakeholder group in meeting the goals of managing travel for planned special events depends on three criteria: integration, adaptability, and transferability:

- **Integration** refers to achieving stakeholder cooperation and coordination across disciplines and jurisdictional boundaries. Interagency resource sharing represents a product of such stakeholder coordination.
- **Adaptability** concerns the ability of stakeholders to adapt to new roles and

responsibilities unique to managing travel for planned special events. These new roles may involve changes in stakeholder authority compared to roles under other types of planned and unplanned events.

- **Transferability** refers to maintaining continuous interagency communication, sharing of expertise to effect interagency training, and exchanging observations and lessons learned relative to stakeholder experiences.

The discussed criteria facilitates good management that, in turn, helps meet the needs of all road users and achieve satisfactory outcomes for each involved stakeholder.

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CHAPTER THREE
OVERVIEW

Figure 3-1
Event Pedestrian Management

PURPOSE

This chapter presents a high-level summary of managing travel for planned special events for all users of this technical reference. It aims to identify the key aspects of each step necessary to manage travel for a specific planned special event and all special events in a region.

This chapter provides a *background* on the purpose of managing travel for planned special events. It highlights all of the steps necessary to manage travel for a particular planned special event and all planned special events in a region. Recommended policies, guidelines, procedures, strategies, and resource applications that support and facilitate each step are indicated and organized through the following five phases: *program planning*, *event operations planning*, *implementation activities*, *day-of-event activities*, and *post-event activities*.

INTRODUCTION

This chapter provides all users with a working knowledge of the techniques and strategies that practitioners may use to successfully: (1) plan for and operate a particular planned special event or (2) manage all planned special events in a region. In turn, individual stakeholders gain an understanding of the collective tasks facing multidisciplinary and inter-jurisdictional planned special event stakeholder groups charged with

developing and implementing solutions to acute and system-wide impacts on travel during a special event.

Subsequent chapters of this handbook provide expanded and in-depth coverage of all potential tasks and stakeholder activities conducted within individual planned special event management phases. Chapters 4 through 10, which represent the core chapters of this handbook, contain detailed information on advance planning, day-of-event operation, and post-event evaluation activities that stakeholders perform and/or consider in mitigating special event impacts on transportation system operations. Chapters 11 through 15 describe an advance planning and travel management process and considerations specific to a particular category of planned special event.

A background section describes how transportation operations vary during a planned special event and identifies advance planning activities employed to successfully manage travel for a special event. This section identifies specific stakeholders, coupled with their typical duties and responsibilities, that may actively participate under different phases of special event management. It also includes a discussion on the distinct, chronological phases of managing travel for planned special events, including the common products generated in each phase and associated benefits of carrying out each phase.

A section on categories of planned special events identifies special characteristics specific to each event category that impacts transportation system operations.

This chapter concludes by summarizing planning approaches, operational strategies, and technology applications for managing transportation system operations during phases of managing travel for planned special events. These sections collectively present all the steps necessary to manage travel for a particular planned special event in addition to future events in a region.

BACKGROUND

In the past, the media has reported horrendous traffic congestion that has occurred at several major planned special events. In one instance, golfers participating in a major professional golf tournament were caught in major traffic jams along with event patrons and other motorists. Facing a 2-stroke penalty or disqualification if they arrived at the first tee past their assigned tee time, several players pulled their cars to the side of the road, carried their golf bags, and walked to the course. These situations emphasize the need for this handbook, which presents policies, guidelines, procedures, strategies, and resource applications that assure the successful management of travel for planned special events.

What is Managing Travel for Planned Special Events?

A planned special event creates an increase in travel demand and may require road closures to stage the event. Planned special events generate trips, thus impacting overall transportation system operations. This includes freeway operations, arterial and other street operations, transit operations, and pedestrian flow. Unlike roadway construction activities or traffic incidents that constrain travel within a single corridor, planned special events affect travel in all corridors serving the event venue.

Managing travel for planned special events involves developing a transportation management plan that contains operations and

service strategies specific to managing traffic, transit, and travel demand. As shown in Figure 3-2, a transportation management plan consists of three components:

- Traffic management plan
- Transit plan
- Travel demand management initiatives

Traffic operations agencies, transit agencies, law enforcement agencies, and event organizers represent key stakeholders in the transportation management plan development process because of the responsibility they bear in developing, approving, and implementing the plan. To ensure that the plan addresses the requirements of all those impacted, the event planning team should be comprised of a wide range of stakeholders:

- Event operations stakeholders focus on mitigating the safety, mobility, and reliability impacts on transportation operations.
- Community interest stakeholders seek to minimize impacts on community quality of life and maximize potential social and economic benefits.
- Event support stakeholders serve to support and execute the transportation management plan by following proposed initiatives or providing necessary resources for plan deployment.

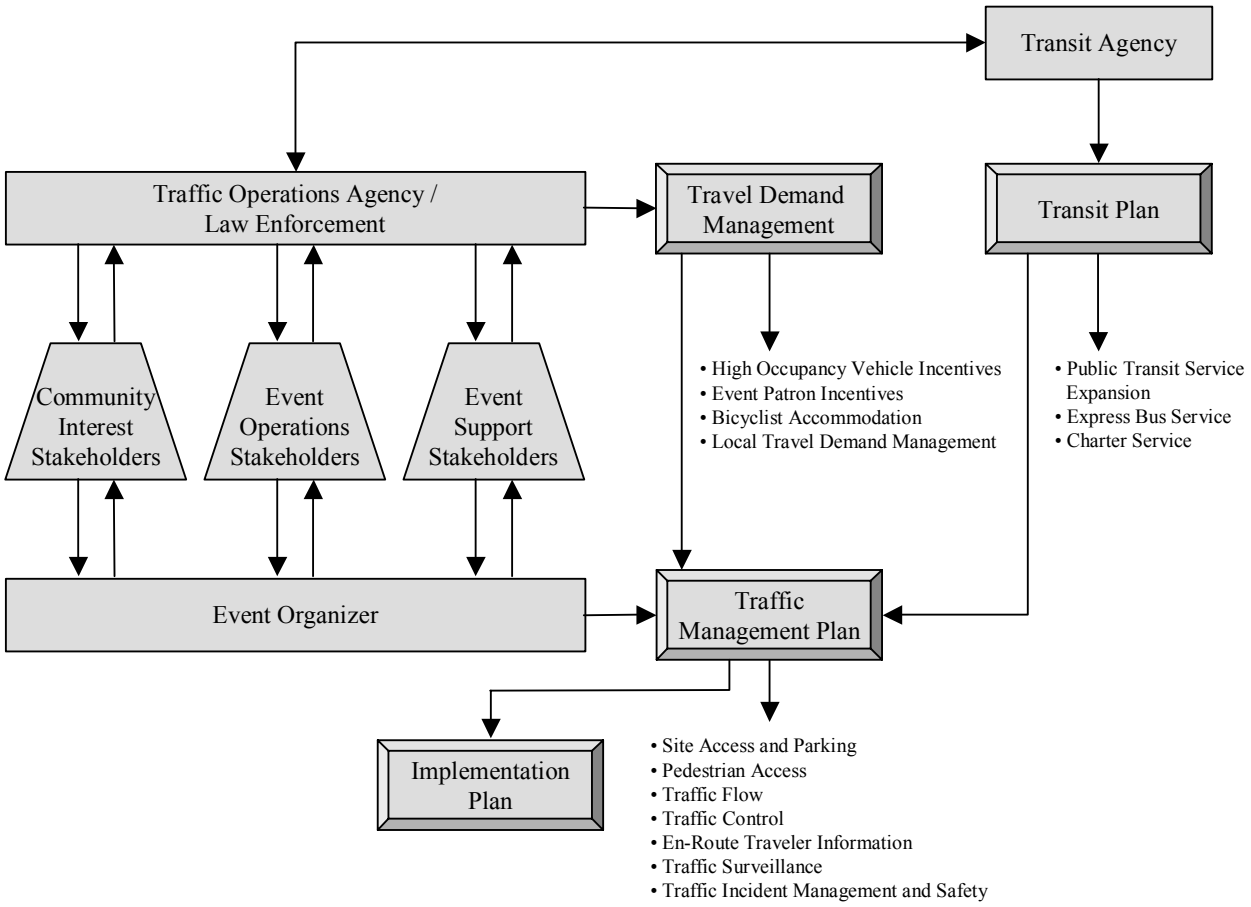

Figure 3-2
Transportation Management Plan Components and Event Planning Team Involvement

Stakeholder Roles and Coordination

The advance planning and management of travel for planned special events requires the consistent involvement and coordination of stakeholders throughout all phases of the event. Table 3-1 indicates the responsibilities of the three stakeholder groups.

- An oversight team involves mid-to-upper level representatives of transportation agencies and law enforcement. Additional stakeholders include elected officials, regional organizations, and other government agencies.
- The event planning team consists of mid-level representatives of transportation agencies and law enforcement as well as the event organizer, media, public safety agencies, private industry, and the public.
- A traffic management team includes operations managers and field personnel representing transportation agencies, law enforcement, the event organizer, media, and private industry.

Major annual event or venue task forces exist in some jurisdictions that serve the role of both an oversight team and event planning team. The task force may meet year-round to mitigate lessons learned from past events, then expand to include additional event operations stakeholders as the next event nears.

Figure 3-3 presents common stakeholders, representing various disciplines and jurisdictions, that play an active role in managing travel for planned special events on a local and/or regional level.

The following subsections describe the potential roles and responsibilities of each identified stakeholder in addition to his or her coordination with other planned special events stakeholders.

Table 3-1
Responsibilities of Stakeholder Groups

STAKEHOLDER GROUP	FUNCTION
Oversight Team	• Manage all planned special events in a region. • Establish policies, regulations, procedures, and task forces for future application to a specific planned special event. • Identify infrastructure improvements and evaluate potential new technology applications. • Interact with an event planning team, consulting on feasibility study results and evaluating conceptual transportation management plan components.
Event Planning Team	• Conduct event operations planning activities for a specific planned special event. • Perform traffic management plan implementation tasks.
Traffic Management Team	• Manage travel on the day-of-event. • Interact with the event planning team during implementation activities. • Debrief the oversight team and event planning team during post-event evaluation activities.

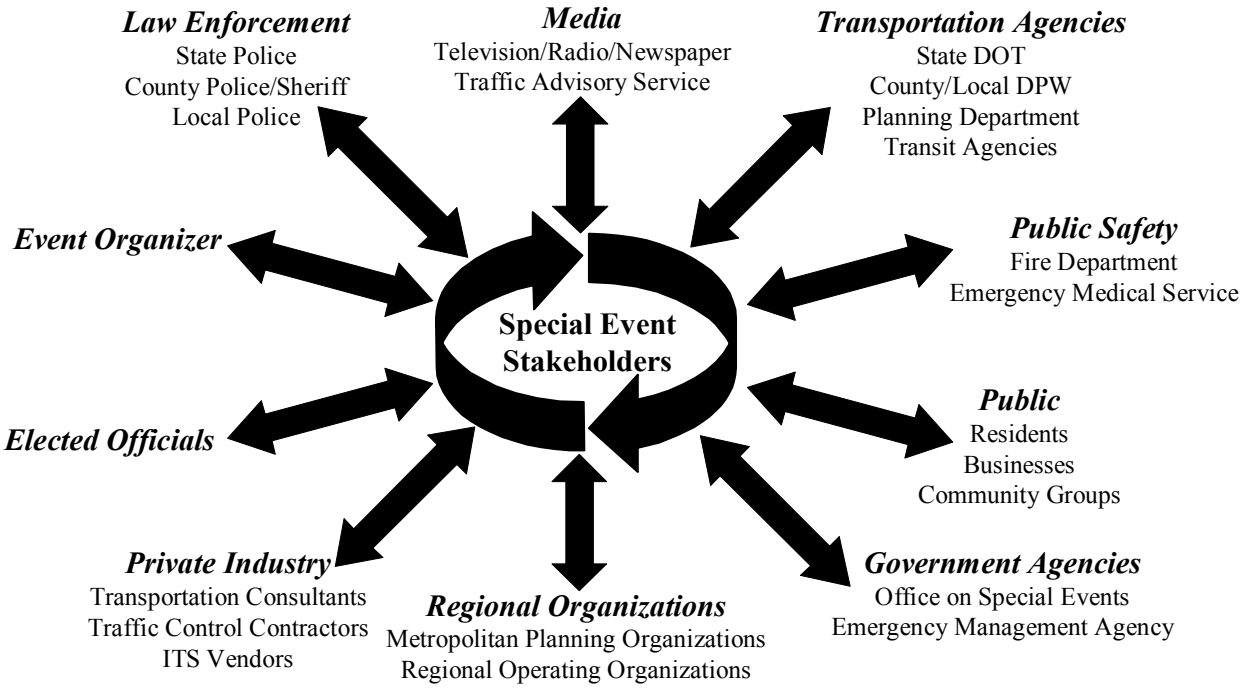

Figure 3-3
Planned Special Event Stakeholders

Transportation Agencies

Transportation agencies own and operate the transportation system serving a planned special event. These agencies staff all three of the above mentioned stakeholder groups, although actual personnel may vary from group to group. Because of their involvement in every phase of managing travel for planned special events, transportation agencies have the unique opportunity to form partnerships with other stakeholders at different working levels. Such partnerships may lead to: (1) creation of interagency agreements at the program planning or oversight level, (2) agreement to share closed-circuit television (CCTV) video at the event operations planning or mid-level, and (3) improvement of communications and coordination at the field level.

A state department of transportation (DOT) typically leads advance planning and day-of-event traffic management for freeway and/or arterial corridors serving an event venue. This includes operating a traffic management system to monitor, advise, and control traffic flow on these high-capacity routes. A state DOT may also facilitate the acquisition and deployment of portable, advanced technology equipment providing increased traffic management and monitoring capabilities.

A local or county department of public works (DPW) may include traffic engineers participating in program planning, event operations planning, and day-of-event traffic management. At the program planning level, the agency may initiate infrastructure improvement projects or establish traffic control guidelines for event permits. Event operations planning activities may include developing or reviewing proposed traffic management plans and developing traffic signal system timing plans to accommodate anticipated fluctuations in traffic demand. The agency has authority to enact temporary traffic and parking restrictions on streets adjacent to an event venue. Traffic engineers often serve a supervisory role on a traffic management team. In general, agency officials must monitor and maintain traffic flow traversing their jurisdiction. A local/county DPW assumes an expanded role in traffic operations planning and management for local level planned special events. The agency may also utilize roadway maintenance personnel to deploy required temporary traffic control devices, repair potholes along a parade route, and perform post-event street sweeping.

A planning department may administer a permit program for special events while a local jurisdiction planning commission may rule on the transportation component of an event permit application.

The previous section described the role of transit agencies in managing travel for planned special events, which may include service expansions and achieving cooperative agreements with private bus companies to obtain additional equipment and drivers.

Law Enforcement

Law enforcement agencies facilitate the safe and efficient flow of traffic during a planned special event through traffic control and enforcement. Agencies contribute to all phases of planned special events, particularly event-specific advance planning and traffic management. Local and county law enforcement having a traffic operations bureau may take responsibility for developing and executing a local street traffic management plan. Other potential duties of law enforcement include approving local street closures, approving an event traffic flow plan, approving temporary traffic control deployment, escorting dignitaries to/from the event venue, and enforcing the requirements of a traffic operations agency.

Event Organizers

Event organizers initiate the event operations planning phase by notifying stakeholders, either through a written request to public agencies or the submission of an event permit application, and assembling an event planning team. The event organizer continually works to maintain interagency coordination in order to meet milestones in the advance planning process and ultimately gain stakeholder approval of the proposed transportation management plan. The event organizer may hire a private traffic engineering consultant to perform an event feasibility study and prepare a traffic management plan. The event organizer may also fund the deployment of equipment and personnel resources, including reimbursement of public agency personnel costs, required to mitigate traffic safety, mobility, and reliability impacts during the day-of-event. An event venue operator essentially represents an event organizer. These venue operators may work together with transportation agencies, law enforcement, and elected officials during the program planning phase to develop strategies, including permanent installation of equipment for improved traffic monitor-

ing and control, to better accommodate traffic and transit access to the venue.

Elected Officials

Elected officials serve the overall community interest and often play a significant role on an oversight team. Local politicians can establish laws and regulations toward effecting improvements in planning and managing future planned special events. They may create a special task force to assist event organizers and local agencies to coordinate event planning activities. Local district politicians may advise an event planning team on alternatives to minimize quality of life impacts on represented residents and businesses.

Public Safety

Public safety agencies, including a fire department and emergency medical service, represent event operations stakeholders that advise the event planning team on the provision of emergency access routes to and from the event venue. Public safety agencies, in addition to law enforcement and an emergency management agency, also work as part of the event planning team to ensure adequate pedestrian access routes and evacuation destination areas exist to meet emergency management plan requirements.

Media

The media functions to disseminate event pre-trip travel information, in addition to real-time traffic and transit information during the day-of-event. A media representative may participate in a meeting of the event planning team to obtain advance information on proposed temporary traffic control, transit, and travel demand management initiatives. However, the media generally works independently of the traffic management team on the day-of-event.

Private Industry

Private industry satisfies a wide range of public agency needs from the event operations planning phase through the day-of-event activities phase. Traffic engineering consultants may assume the role of a public agency traffic engineer and, in turn, develop a transportation management plan and manage either an event planning team, traffic management team, or both. Private traffic control contractors, such as barricade companies, fulfill the duties of a transportation agency maintenance department. Intelligent Transportation Systems equipment vendors contract with transportation agencies to:

- Supply and install on streets serving a fixed event venue, *permanent* equipment such as CCTV cameras, lane control signals, dynamic trailblazers, and parking management systems
- Deploy *portable* traffic management systems, including portable CCTV, portable changeable message signs (CMSs), portable highway advisory radio (HAR), portable vehicle detectors, and portable traffic signals.

In some instances, transportation agencies may arrange for an equipment demonstration, at no cost to the agency, to evaluate the performance of a particular technology application during a planned special event.

Regional Organizations

Regional organizations interact with both the oversight team and an event planning team regarding major planned special events affecting a regional area. A Metropolitan Planning Organization (MPO) oversees the planning and programming of transportation

management strategies. For example, the agency may communicate and seek feedback on temporary travel demand management strategies with commuter groups and trucking companies. A MPO may loan staff to other public agencies in need of personnel to conduct planning and operations activities. The agency may also establish and/or coordinate temporary task forces charged with a particular function, such as event communications. A Regional Operating Organization (ROO) consists of traffic operations agencies, transit agencies, law enforcement, elected officials, and other operations agencies focused on the operation and performance of a regional transportation system. A ROO works to ensure interagency coordination of resources and information across jurisdictional boundaries. It builds partnerships and trust among agencies to improve their productivity and performance, thus creating a more responsive approach to mitigating temporary capacity deficiencies. ROO member agencies may, for example, share traffic signal timing plans, coordinate planned strategies and resources for managing travel, conduct public outreach, and participate in interagency training.

Government Agencies

Government agencies, such as a government office on special events or emergency management agencies, are non-transportation agencies that generally serve in an oversight capacity. A government office on special events may work in tandem with the event organizer to initiate the event operations planning phase and coordinate event planning team stakeholders. Other emergency management and security agencies may meet with the event planning team to obtain an advance debrief on transportation management plan specifics.

Public

The public represents individual residents, businesses, and associated community groups. Residents and businesses potentially impacted by intense traffic and parking demand generated by a planned special event may interact with event planning team stakeholders during a public meeting. This permits concerned citizens the opportunity to review and comment on proposed traffic and parking restrictions needed to accommodate event traffic.

Phases of Managing Travel for Planned Special Events

The practice of managing travel for planned special events incorporates advance planning, management, and evaluation activities encompassing five distinct, chronological phases. Figure 3-4 summarizes the five phases and common products generated by coordinated stakeholder groups under each phase. Collectively, these phases facilitate the successful management of transportation system operations during a planned special event.

Integration of the identified phases, from the post-event activities phase to the program planning phase, creates a seamless process allowing for continuous improvement of transportation system performance from one event to the next, especially in regard to recurring events or events occurring at permanent venues. This iterative process, where stakeholders apply successes and lessons learned from a particular special event to future events, supports activities pertaining to managing travel for all planned special events in a region. Recognition and integration of special event management phases achieves coordination across stakeholder groups, namely the oversight team, event

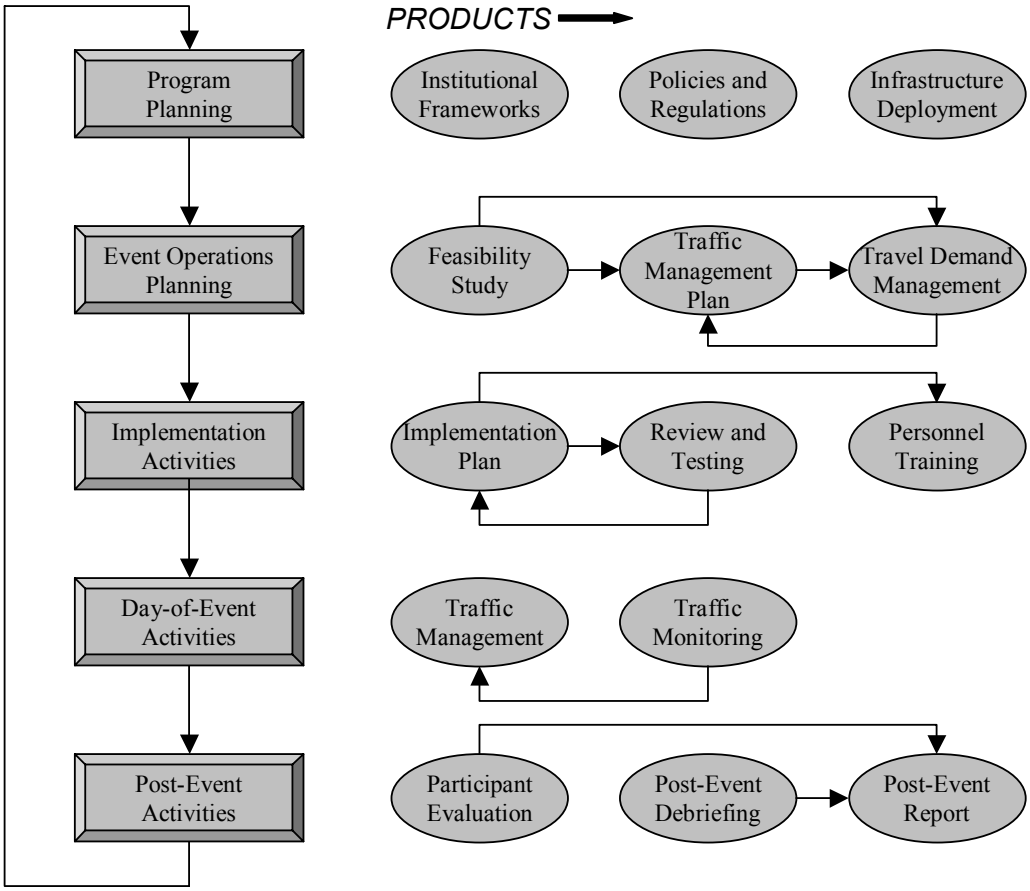

Figure 3-4
Planned Special Event Management Phases and Associated Products

planning team, and traffic management team.

PLANNED SPECIAL EVENT CATEGORIES

The first step toward achieving an accurate prediction of event-generated travel demand and potential transportation system capacity constraints involves gaining an understanding of the event characteristics and how these characteristics affect transportation operations. In turn, practitioners can classify the planned special event in order to draw comparisons between the subject event and similar historical events to shape travel forecasts and gauge transportation impacts.

Table 3-2 lists typical operational characteristics of a planned special event. Each characteristic represents a variable that greatly influences the scope of event operation and its potential impact on the transportation system.

These event operation characteristics create five categories of planned special events, indicated in Table 3-3.

Discrete/Recurring Event at a Permanent Venue

A discrete/recurring event at a permanent venue occurs on a regular basis at a site zoned and designed specifically to accom-

modate planned special events. This category includes sporting and concert events at stadiums, arenas, and amphitheaters in urban and metropolitan areas. Table 3-4 lists key characteristics of a discrete/recurring event at a permanent venue.

Table 3-2
Event Operation Characteristics

CHARACTERISTIC
• Event time of occurrence
• Event time and duration
• Event location
• Area type
• Event market area
• Expected attendance
• Audience accommodation
• Event type

Table 3-3
Categories of Planned Special Events

SPECIAL EVENT CATEGORIES
• Discrete/recurring event at a permanent venue
• Continuous event
• Street use event
• Regional/multi-venue event
• Rural event

Table 3-4
Distinguishing Operating Characteristics of a Discrete/Recurring Event at a Permanent Venue

CHARACTERISTIC
• Specific starting and predictable ending times
• Known venue capacity
• Advance ticket sales
• Weekday event occurrences

Continuous Event

A continuous event includes fairs, festivals, conventions, and air/automobile shows in urban and metropolitan areas. Aside from conventions and state/county fairs, many continuous events take place at a temporary venue, a park, or other large open space. These venues host planned special events on a less frequent basis than permanent multi-use venues, and planned special event permitting typically governs whether a temporary venue can adequately handle the transportation impact of a particular continuous event. Table 3-5 lists key characteristics of a continuous event.

Table 3-5
Distinguishing Operating Characteristics of a Continuous Event

CHARACTERISTIC
• Occurrence often over multiple days
• Arrival and departure of event patrons throughout the event day
• Typically little or no advance ticket sales
• Capacity of venue not always known
• Occurrence sometimes at temporary venues

Street Use Event

A street use event occurs on a street requiring temporary closure. Events classified under this category include parades, street races, and motorcycle rallies occurring in rural, urban, and metropolitan areas. These events generally occur in a city or downtown central business district; however, race events or motorcycle rallies may necessitate temporary closure of arterial streets or limited-access highways. Planned special event permitting guidelines and restrictions typically (1) influence event operations characteristics (e.g., location, street use event route, time of occurrence, etc.) and (2) govern whether a traffic management plan can mitigate the transportation impact of a particular street use event. Table 3-6 lists key characteristics of a street use event.

Table 3-6
Distinguishing Operating Characteristics of a Street Use Event

CHARACTERISTIC
• Occurrence on a roadway requiring temporary closure
• Specific starting and predictable ending times
• Capacity of spectator viewing area not known
• Spectators not charged or ticketed
• Dedicated parking facilities not available

Regional/Multi-Venue Event

A regional/multi-venue event refers to multiple planned special events that occur within a region at or near the same time. Individual events may differ by classification category. Example regional/multi-venue events include: (1) occurrence of a single-theme event requiring multiple venues to stage the event, (2) occurrence of a downtown parade or festival in the vicinity of a downtown fixed venue also hosting a special event, or (3) occurrence of special events at two fixed venues in a region at or near the same time. Concurrent planned special events require consideration as a regional/multi-venue event if traffic generated by different, competing special events use the same traffic flow routes (e.g., freeway/arterial corridors, local streets) or parking areas over the same time frame. As a result, stakeholders involved in planning and managing individual special events must, as a group, forecast and mitigate the global impact of concurrent special events on transportation system operations. Table 3-7 lists key characteristics of a regional/multi-venue event.

Table 3-7
Distinguishing Operating Characteristics of a Regional/Multi-Venue Event

CHARACTERISTIC
• Occurrence of events at multiple venues and at or near the same time • Events having a time specific duration, a continuous duration, or both • Overall capacity generally not known if continuous events or street use events are involved

Rural Event

A rural event encompasses any discrete/recurring event or continuous event that occurs in a rural area. Events classified under this category include fairs, festivals, and events at rural amphitheater and racetrack venues. These events indicate that rural events collectively have the event operation characteristics of discrete/recurring events at a permanent venue and continuous events with one notable exception; rural events take place in rural areas. Table 3-8 lists key characteristics of a rural event.

Table 3-8
Distinguishing Operating Characteristics of a Rural Event

CHARACTERISTIC
• Rural or rural/tourist area • High attendance events attracting event patrons from a regional area • Limited roadway capacity serving an event venue • Area lacking regular transit service. • Events having either a time specific duration or continuous duration

PROGRAM PLANNING

Program planning for planned special events involves activities unrelated to a specific event. This level of advance planning involves the participation and coordination of stakeholders having an oversight role in addition to agencies directly responsible for event operations planning. Products of program planning include establishing new institutional frameworks, policies, and legislation to monitor, regulate, and evaluate future planned special events. Stakeholders utilize program planning initiatives to more efficiently and effectively complete event operations planning, implementation activities, day-of-event activities, and post-event activities for individual, future planned special

events. In turn, post-event activities (e.g., participant evaluation, stakeholder debriefing meeting, evaluation report) performed for specific special events provide valuable input for on-going program planning activities in a region or jurisdiction.

Regional Level

Program planning for planned special events on a regional level concerns proactively improving travel management for all planned special events in a region. Program planning requires an institutional framework for generating and managing successful programs and initiatives. Some key considerations include:

- Role of oversight stakeholders
- Policy support
- Regional planned special events program

Stakeholder Roles and Coordination

Program planning for regional planned special events necessitates the involvement and coordination of stakeholders representing multiple jurisdictions. At the program planning level, the stakeholders include:

- Those agencies directly involved in planning and day-of-event travel management for special events. These include law enforcement agencies, transportation departments, transit providers, and regional organizations.
- Others who typically are not involved in transportation management, such as the event organizers and elected officials serving an oversight role.
- Typically, mid-to-upper level agency administrators that collectively form the planned special events oversight team.

The following five-step process represents a way of doing business that facilitates regional coordination when a planned special event occurs:

- Step One: Identify the Stakeholders.
- Step Two: Identify a Lead Agency.
- Step Three: Maintain Communication.
- Step Four: Form Subcommittees.
- Step Five: Continue Communication.

While planned special events may be temporary, and the planning for those events may bring together a group of stakeholders only for that event, ongoing programs and initiatives can be used to address general special event needs on a continual basis. An institutional framework can be created either before an event takes place or based on the planning for a specific special event. This framework can be used on a continuing basis to allow easier coordination among agencies for future events and eliminates the need to re-establish working relationships, which have already been created.

Policy Support

In most instances, transportation and law enforcement agencies have no prohibitions from coordinating efforts with other agencies, especially for events expected to have an impact on that agency. However, there are instances where interagency agreements are helpful, or even necessary, for multi-agency cooperation.

While interagency agreements will vary based on state law and the culture of the agencies, there are some common issues they can address: (1) areas of responsibility and (2) funding issues.

Legislation provides the legal authority for a government agency to take certain actions. In many instances, activities involved in special events planning have already been addressed by legislation.

Regional Planned Special Events Program

A regional planned special events program is an ongoing process designed to address a region's needs for managing special events. It is not a program put in place to address a specific special event, although a specific event may trigger the formation of such a program. The scope of such a program should focus on planned special events of regional significance. If an event can be wholly managed within and by a single agency or jurisdiction (e.g., through a planned special event permit program), then there is no need for the regional plan to come into effect.

The program will put in place the framework for handling regional planned special events. This would include the template for groups created to deal with specific special events, identification of funding to support such planning, and the identification of infrastructure improvement needs in the region to better manage special events.

The stakeholders in a regional program such as this will vary from region to region. Table 3-9 lists organizations that should be considered part of the program. Leadership of the program will vary by region, but the agencies most likely to take the lead include state DOTs, state law enforcement agencies, and MPOs.

Local Level

The development of a formal planned special event permit program marks a key program planning initiative to facilitate stakeholder coordination, compliance with community needs and requirements, and efficient event operations planning. Backed by guidelines and regulations specified in municipal ordinances, the program outlines a defined planning framework and schedule for event organizers and participating review agencies to follow. It represents an *agreement* between participating public agencies (e.g., transportation, law enforcement, public safety, etc.) to ensure, through planning activities or review, that all planned special events meet a set of mutually agreed upon requirements for day-of-event travel management. A municipal permit represents approval, or agreement between a jurisdiction and event organizer, to operate a planned special event, and it includes provisions outside of travel management.

Table 3-9
Regional Program Stakeholder Organizations

STAKEHOLDER ORGANIZATIONS
• State Department of Transportation
• Metropolitan Planning Organization
• State police/patrol
• Toll agencies
• Mass transit agencies
• Municipal governments and police departments
• County governments and police departments
• Owners of large venues (e.g., arenas, stadiums, universities)

Some important considerations and applications of planned special event permitting include:

- Permitting proves particularly effective for less frequent continuous events, street use events, and rural events occurring at a temporary venue not having a known spectator capacity. These events place an emphasis on advance planning and public outreach to mitigate traffic operations deficiencies and community impacts.
- Jurisdictions may not require a permit for special events held at permanent venues, such as stadiums, arenas, and amphitheaters.
- Permitting allows jurisdictions the opportunity to engage the event organizer

at the beginning of the event operations planning phase.

- Public stakeholders can size-up the event operations characteristics of a proposed event in order to schedule adequate personnel and equipment resources to accommodate the event. Resources may include traffic control, security, and maintenance.
- From the event organizer's perspective, a special event permit application and associated regulations outlines a general approach toward successfully managing travel for the event, facilitates coordination with appropriate stakeholders, and gauges resource requirements on the day-of-event.

Permit Process

Initiation of the permit process for a specific planned special event begins with the submission of a completed special event permit application by the event organizer. The permit application represents a formal proposal by the organizer to stage a planned special event. In some cases, particularly those where the event organizer requests assistance from the jurisdiction in locating a suitable venue location or street use event route, the event organizer and pertinent public stakeholders may interact prior to application submission to review the proposed event and permit process.

Figure 3-5 presents a flowchart summarizing key event organizer and public agency actions throughout the special event permit process, from submitting a permit application to conducting the proposed event.

The special event permit process serves to scope, schedule, and direct event operations planning activities for proposed events. This reduces unnecessary delay in facilitating stakeholder coordination, developing planning deliverables (e.g., traffic management plan, etc.), reviewing mitigation strategies, and mobilizing personnel and equipment resources required to stage a particular planned special event. Practitioners may expand and contract the process in order to best fit: (1) the area type and involved stakeholders, (2) the special guidelines and regulations unique to a particular jurisdiction, (3) the operations characteristics of a particular event, and (4) the purpose of a particular event, such as community events versus commercial, for-profit events involving event organizers from the private sector.

Application Components

The special event permit application serves to communicate event operations characteristics to a jurisdiction, thus permitting it to impose appropriate impact mitigation requirements and/or advise the event organizer to change event operation parameters. Key items include the event purpose that may signal the need to develop contingency plans in response to possible security threats or demonstrations. Information regarding event history and expected attendance assists in achieving a more predictable event travel forecast. The application should prompt the event organizer to indicate travel demand management initiatives, including use of carpools and other modes of travel.

Supplemental requirements to a special event permit application, required of the event organizer either at the time of initial application submission or after jurisdiction review of the application questionnaire, include:

- Event site plan
- Traffic flow plan
- Traffic control plan
- Parking plan
- Emergency evacuation plan

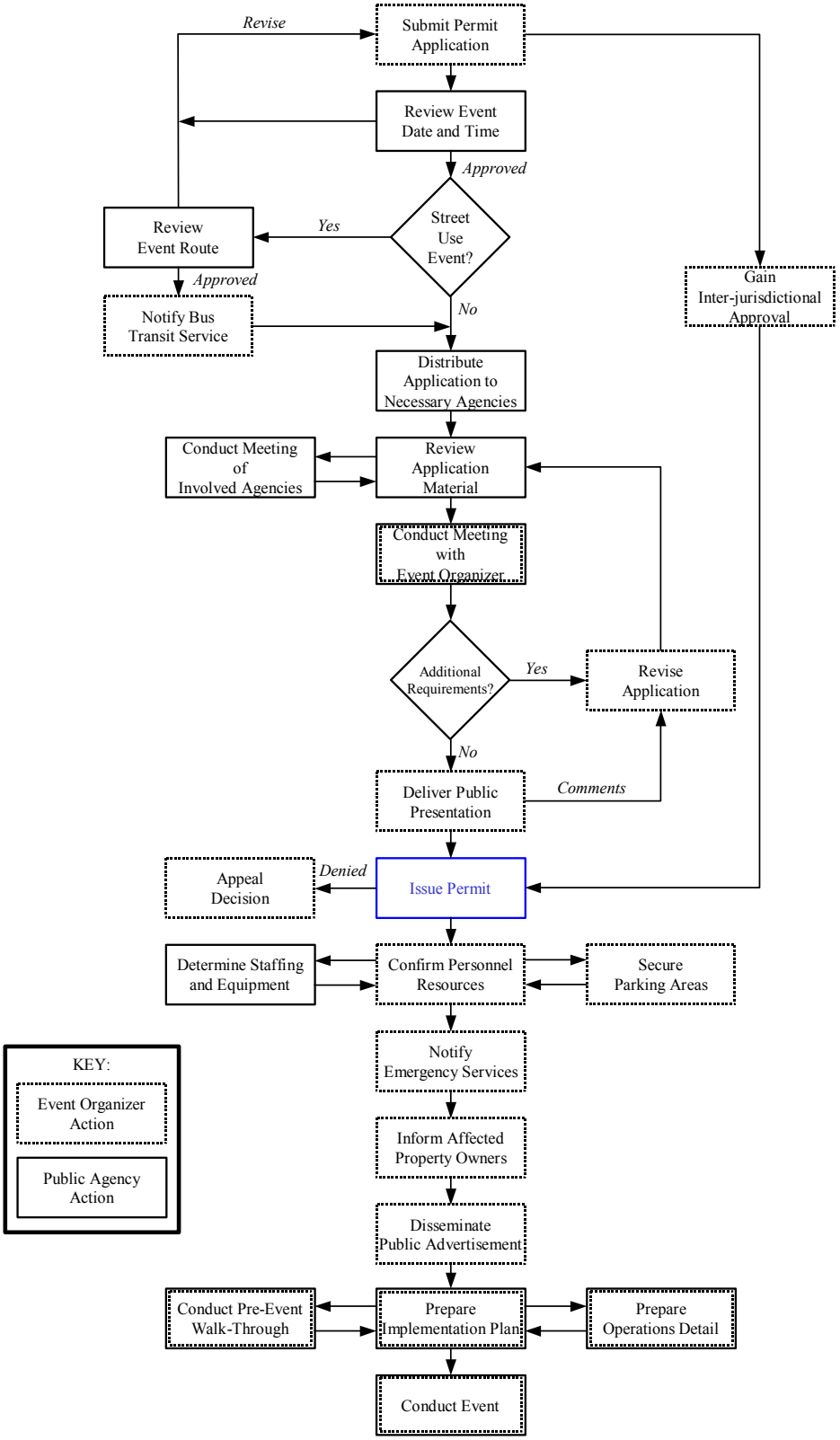

Figure 3-5
Planned Special Event Permit Process

- Notice of event for affected property owners and residents
- Event advertising brochure
- Hold harmless agreement
- Certificate of insurance

Permitting Requirements

Jurisdictions maintain the following general requirements for planned special events: (1) event restrictions, (2) impact mitigation and traffic control, (3) legal, and (4) funding. As indicated in Table 3-10, the municipal codes of jurisdictions across the Nation specify a wide range of requirements for managing travel for planned special events, all of which become incorporated in the special event permit process.

Table 3-10
Municipal Code Provisions on Planned Special Events

PROVISION
• Special event definition
• Conditions for permit requirement
• Permit restrictions
• Content of permit application
• Permit application submission and review deadline
• Notification of city/town officials
• Notification of abutting property owners and residents
• Permit approval criteria
• Event organizer duties
• City/town authority to restrict parking and close local roads
• Hold harmless clause
• Insurance requirements
• Recovery of expenses
• Procedure for appealing a denied permit

EVENT OPERATIONS PLANNING

Event operations planning concerns the advance planning and stakeholder coordination activities conducted for a specific planned special event. The two main steps of the operations planning process involves: (1) completing a feasibility study to forecast event-generated traffic and parking demand and to determine the associated impact on transportation operations during the event and (2) developing a traffic management plan to service event-generated automobile, transit, and pedestrian traffic and to mitigate predicted impacts to the transportation system serving the event venue and surrounding area. Travel demand management represents a key component of the overall advance planning process when forecasted traffic demand levels approach or exceed available roadway capacity.

Figure 3-6 presents 31 steps in the event operations planning process for all planned special events. The flowchart covers development and integration of the phase's three primary products: feasibility study, traffic management plan, and travel demand management initiatives. It represents a suggested order of event operations planning activities. However, as noted below, the event planning team can modify activities to create a dynamic and more effective planning process tailored to the scope of a specific planned special event:

- Based on lessons learned from past special events at a particular permanent venue, stakeholders may program new infrastructure or adopt new policies (e.g., parking restrictions) early in the event operations planning process.
- A jurisdiction planned special event permit process and requirements will scope, schedule, and direct event operations planning activities for continuous events and street use events.
- The event planning team should repeat process steps for individual venue events comprising a regional/multi-venue event.

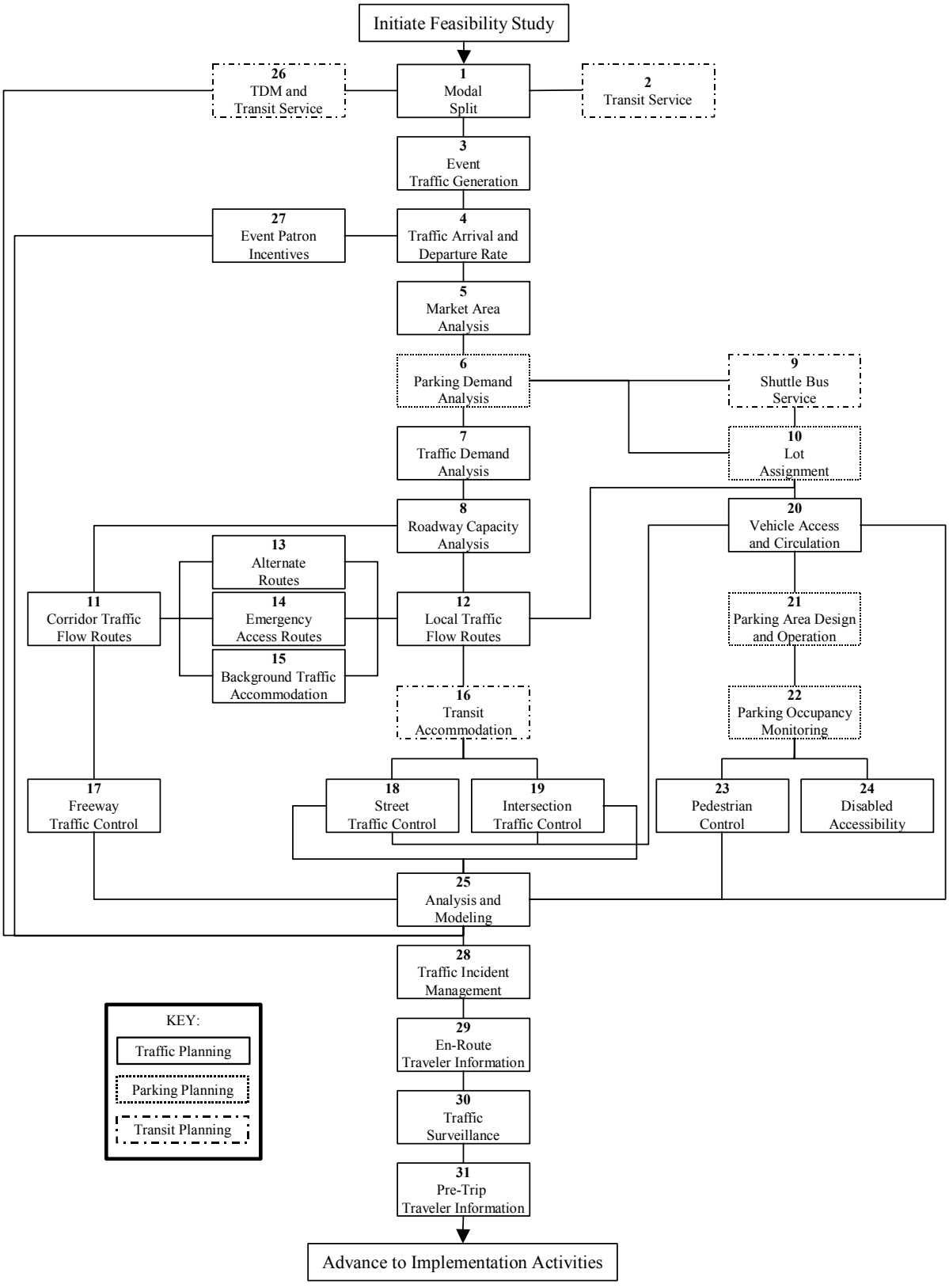

Figure 3-6
Event Operations Planning Process Flowchart

- Links between process steps are two-way as stakeholders evaluate alternative strategies and/or integrate traffic management plan components.
- The event planning team can develop different traffic management plan components concurrently.

Initial Planning Activities

This section examines key planning initiatives and special considerations in order to help guide the user through the first steps of the event operations planning phase. The event operations planning phase begins with stakeholders establishing a planning framework and schedule. The framework includes forming an event planning team, creating agreements, identifying performance goals and objectives, and deciding on mitigation assessment and approval protocol.

Special considerations evolve from reviewing the event operations characteristics of a particular special event (e.g., risk assessment) in addition to past successes and lessons learned. These considerations weigh heavy on traffic management plan requirements, and stakeholders must address issues affecting community residents and businesses through public outreach efforts early in the planning phase in order to ensure proper mitigation and non-conflict with traffic management plan specifications.

Stakeholder Roles and Coordination

The event planning team handles tasks associated with *event-specific operations planning* and *traffic management plan implementation*. The event planning team consists of a diverse group of stakeholders with either event operations or community interest as their primary concern. An event planning team forms as a result of either: (1) coordination among a traffic operations agency, law enforcement, and event organizer that represent the core event planning team stakeholders or (2) designation by a committee on special events within a regional transportation management organization, such as a traffic incident management program.

- The former typically describes event planning teams formed in response to local planned special events affecting few jurisdictions, such as events occurring in rural or urban areas.
- The latter may occur in metropolitan areas where planned special events happen frequently, thus warranting an *on-call* event planning team.

A *regional transportation committee on special events* features stakeholders that have achieved interagency coordination through past, cooperative travel management efforts.

- Stakeholder representatives have first-hand knowledge of the roles, resources, and capabilities of each committee participant.
- Stakeholders commonly include traffic operations agencies, law enforcement, transit agencies, event organizers or venue operators, and the media.
- Committees in metropolitan areas may create task forces for specific planned special event venues or recurring planned special events (e.g., annual fairs, fireworks displays, parades, etc.). The committee or task force generally meets and performs event operations planning tasks on an as-needed basis. The group may also convene regularly (e.g., weekly, monthly, or quarterly) to review program planning efforts for future planned special events.

Risk Assessment

Based on the type and purpose of a planned special event, there exists potential scenarios where event patron or non-attendee behavior may cause overcrowded conditions in the vicinity of an event venue and/or create unplanned road closures. The event planning team must assess the nature of a proposed event and determine the need to incorporate special contingency plans in response to potentially dangerous situations that will interfere with the planned travel management on the day-of-event.

Table 3-11 lists four notable event-oriented risk scenarios associated with some planned special events.

Performance Goals and Objectives

The goals of managing travel for planned special events include *achieving predictability*, *ensuring safety*, and *maximizing efficiency*. Table 3-12 states performance objectives, for specific classes of transportation system users, applicable to satisfying the overall goal of operations efficiency and safety. In meeting these performance objectives, the event planning team must target the goal of achieving predictability during

Table 3-11
Summary of Event-Oriented Risk Scenarios

EVENT-ORIENTED RISK	EXAMPLE SCENARIO
Demonstration or protest	• Any event that is political in nature or invokes social concern. • Political conventions and parades
Ticketless event patrons causing overcrowding	• Sold-out sports championship games • Sold-out concerts involving select performers
Fan celebration	• Response to city or school sports team winning a championship.
Event patron violence	• Motorcycle rally violence between patrons and/or participants.

Table 3-12
Transportation System Operations Performance Objectives for Planned Special Events

USER CLASS	PERFORMANCE OBJECTIVE
Event patron	• Minimize travel delay to/from the event. • Minimize conflicts between pedestrians and vehicles. • Minimize travel safety hazards. • Minimize impact of traffic incidents. • Disseminate accurate, timely, and consistent traveler information. • Increase automation of traffic control. • Maximize site access service flow rates.
Non-attendee road user	• Minimize travel delay on major thoroughfares, freeways and major arterials. • Minimize impact on commuter and trucker travel time reliability. • Maintain required parking and access for local residents and businesses. • Maintain unimpeded access for emergency vehicles.
Transit user	• Maintain scheduled travel times. • Minimize transit bus dwell times. • Maintain required transit station parking for non-attendee transit users.

the event operations planning phase. Table 3-13 presents common, easy-to-measure measures of effectiveness (MOEs) for assessing the performance objectives that describe traffic operations. The identified MOEs represent day-of-event performance evaluation data, useful for: (1) making real-time adjustments to the traffic management plan on the day-of-event, (2) conducting a post-event evaluation of transportation system performance, and (3) referencing during advance planning for future event occurrences.

Table 3-13
Measures of Effectiveness for Assessing Performance Objectives

LOCATION	MEASURE OF EFFECTIVENESS
Venue parking areas	• Occupancy and turnover rate • Arrival and departure service rate • Time to clear parking lots
Intersections	• Vehicle delay • Queue length
Freeways and streets	• Travel time and delay • Traffic volume to capacity ratio • Traffic speed • Number and location of crashes and other incidents • Traffic incident clearance time

Planning Schedule and Deliverables

Figure 3-7 illustrates a high-level event operations planning schedule for an event planning stakeholder group. The figure lists advance planning activities and potential stakeholder meetings and public hearings in a timeline relative to the planning deliverables. The schedule indicates other stakeholder planning initiatives, such as the development of a specialized transit plan to reduce event traffic demand.

The planning schedule provides a generic timeline, recognizing that actual event operations planning schedules vary considerably. For instance, some major, roving planned special events, such as the U.S. Golf Open, require an event operations planning phase spanning more than one year.

Public Outreach

Planned special events that may impact adjacent neighborhoods and businesses usually require public involvement to address related concerns. The public represents individual residents, businesses, and associated community groups. Public outreach activities initiated early in the event operations planning phase can reveal important issues that local residents and businesses may have. Specific neighborhood impact issues include heavy traffic demand on local streets and event patron use of available local on-street parking. Soliciting these concerns through public involvement, and addressing the issues in the planning process, can improve relations and day-of-event operations.

The event planning team and public stakeholders should identify potential problems prior to the development of the traffic management plan. These problems can be identified by first understanding the event scope with consideration given to current neighborhood traffic and parking restrictions, traffic management plans deployed during past planned special events, and identified problems experienced during past events. With this information, the public stakeholders can make informed decisions and provide valuable input to the event planning team.

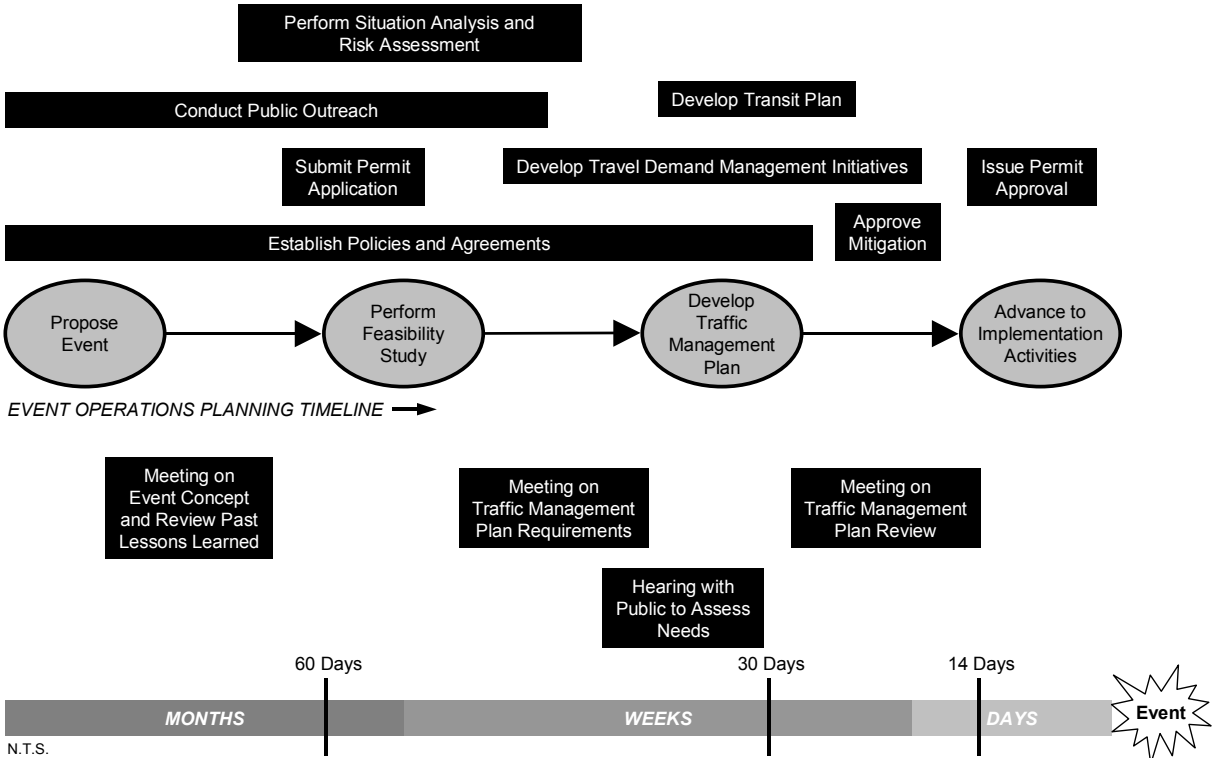

Figure 3-7
Event Operations Planning Schedule

Stakeholder Review of Planning Products

The event operations planning phase includes intermediate and final review periods for the event feasibility study and traffic management plan. Stakeholder review concentrates on the identification and proposed mitigation of event travel impacts. Effective and rapid stakeholder review of event operations planning products requires: (1) an annotated planning timeline, (2) a review process, and (3) performance standards. An annotated planning timeline proves effective for monitoring team progress. Adopting a formal review process reduces unnecessary delay in producing event operations planning deliverables required to stage a planned special event.

Policies and Agreements

The establishment of special policies and agreements to support planning and day-of-event management of planned special events facilitates efficient stakeholder collaboration and defines important event support stakeholder services that may be incorporated into a traffic management plan for a particular planned special event. These initiatives improve interagency relationships, clarify decision-making responsibilities and expectations, and secure on-call services and agency actions. Stakeholders may develop policies and agreements specific to a particular planned special event or for all planned special events in a region. Because of the potential significant time to develop and approve a particular policy or agreement, stakeholders should establish these initiatives early in the event operations planning phase or during the program planning phase.

Table 3-14 summarizes four types of policies and agreements involving stakeholders responsible for event operations planning and/or day-of-event operations.

Feasibility Study

The structure and approach of a planned special event feasibility study resembles a *Traffic Impact Study* required for planned developments, as illustrated in Figure 3-8. The figure shows the sequential steps in preparing a feasibility study for a planned special event.

Table 3-15 provides an overview of the first five feasibility study components. The accuracy of one analysis influences that of another. *Achieving predictability*, a goal of managing travel for planned special events, represents the focus of a feasibility study effort.

The feasibility study gauges the impact a proposed event has on traffic and parking operations in the vicinity of the venue. It determines if a particular planned special event will cause travel problems, where and when the problems will occur, and the magnitude of each identified problem using various MOEs. Initially, the study is conducted *without* roadway capacity improvements or initiatives to reduce travel demand. Once the feasibility study identifies event travel problems, practitioners can take steps to mitigate transportation system deficiencies. These results define the scope of the traffic management plan required to successfully manage travel for a planned special event.

Travel Forecast

Travel forecast analysis involves estimating: (1) modal split, (2) event traffic generation, and (3) traffic arrival rate. Event planning team stakeholders that typically collaborate on this analysis include a traffic operations agency, traffic engineering consultant, transit agency, and event organizer.

Under the scope of a feasibility study, modal split concerns identifying the existing modes of travel event patrons will use to access the event venue site. Common travel modes include personal automobile, public transit, and walking. Public transit refers to scheduled bus transit or commuter rail. Transit agencies may assist in determining a base transit split, without service incentives or promotion, for patrons traveling to/from the event.

Table 3-14
Summary of Policies and Agreements Applicable to Managing Planned Special Events

ITEM	EXAMPLE APPLICATION
Interagency agreement	• Joint operations policy between stakeholders that establishes a shared role regarding event operations planning and day-of-event travel management. • Memorandum of understanding defining stakeholder roles and responsibilities. • Mutual-aid agreement facilitating resource sharing and/or reimbursement for services.
Standard street use event routes	• Routes established under the program planning phase for recurring street use events such as parades and races.
Toll facility congestion policy	• Suspension of tolls during periods of heavy congestion.
Public-private towing agreement	• On-call towing and recovery services during a special event.

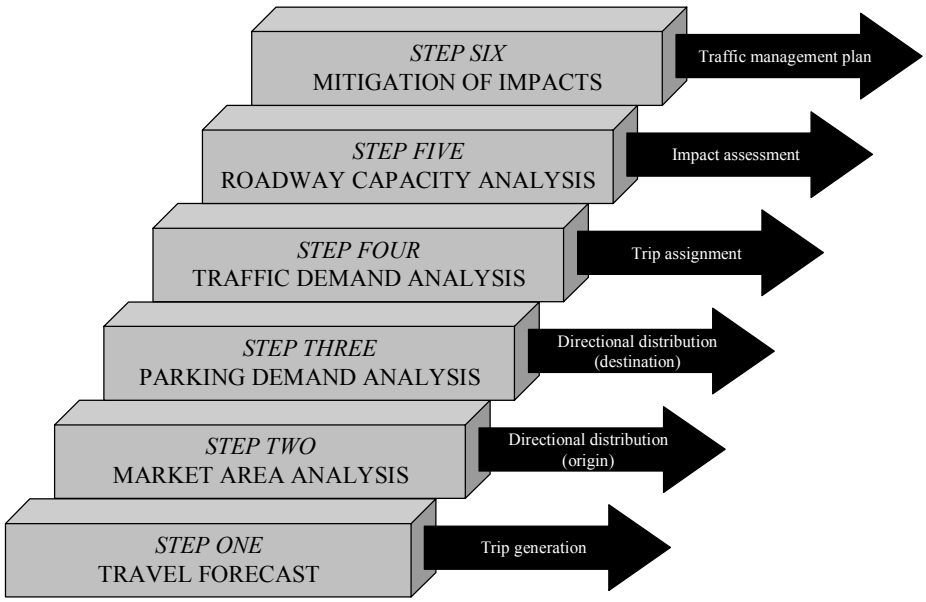

Figure 3-8
Feasibility Study Analysis Steps

Table 3-15
Feasibility Study Analysis Summary

COMPONENT	ANALYSIS	RESULT	APPLICATION
Travel forecast	• Modal split	• Number of trips by mode of travel	• Input into parking demand analysis. • Input into traffic demand analysis.
	• Event traffic generation	• Number of vehicle trips by personal automobile	
	• Traffic arrival rate	• Number of trips per unit of time	
Market area analysis	• Event trip origin	• Geographic location of event trip origins and percent split	• Input into traffic demand analysis.
Parking demand analysis	• Background parking occupancy	• Number of non-attendee vehicles per parking area and unit of time	• Input into event parking occupancy.
	• Event parking demand	• Number of event-generated vehicles per parking area and unit of time	• Input into traffic demand analysis.
Traffic demand analysis	• Background traffic flow	• Background traffic demand rate, adjusted for event-required road closures	• Input into roadway capacity analysis.
	• Event traffic assignment	• Event traffic demand rate per assigned route	
Roadway capacity analysis	• Section and point capacity	• Identification of capacity constraints and level of service	• Input into traffic management plan. • Input into travel demand management assessment.
	• Network operations	• Identification of bottleneck locations and saturation flow rates	

Unlike other traffic generators such as commercial developments, planned special event practitioners typically have advance knowledge of event attendance and, in turn, can develop traffic generation estimates via vehicle occupancy factors. Table 3-16 outlines a two-step process for forecasting event traffic generation. Input data includes a modal split estimate since the traffic generation forecast aims to estimate the number of event-generated trips by personal automobile. Vehicle occupancy factors can serve as the basis for estimating event-generated traffic.

In order to estimate peak traffic volumes generated by an event, practitioners must estimate the time and scope of peak traffic flow during event ingress and egress. Traffic arrival and departure rate indicates the peak period (e.g., hour or 15 minute) of event-generated traffic. The rate is used to determine the following key parameters for input into the traffic demand analysis: (1) peak period time and (2) percent of total event-generated traffic within the peak period. Event operation characteristics that influence traffic arrival and departure rates include:

- Event time and duration – e.g., specific start time, abrupt end time, continuous operation.
- Event time of occurrence – e.g., day/night, weekday/weekend.
- Audience accommodation – e.g., reserved seating, general admission.
- Event type – e.g., sports/concert, fair/festival, parade/race.

Market Area Analysis

A market area analysis identifies the origin and destination of trips to and from a planned special event. The analysis focuses on developing a regional directional distribution of event patron trips to/from an event site via personal automobile. The site refers to the collective parking areas serving the venue. A regional directional distribution specifies: (1) the freeway and arterial corridors serving the venue site and (2) the percent split and volume of event-generated automobile trips traversing each corridor.

Table 3-17 summarizes three analysis methods used to define a planned special event market area.

Parking Demand Analysis

A parking demand analysis functions to determine the amount of required parking for event patrons in the vicinity of the event venue. A parking occupancy study drives the overall analysis and determination of event parking areas. This study indicates the level of parking spaces occupied, relative to lot capacity, at intermittent time intervals. It also specifies an estimate of peak parking demand, a figure particularly useful for managing continuous events where parking space turnover occurs throughout the event day.

Table 3-16
Traffic Generation Forecast Process

COMPONENT	DETAIL
Input data	• Daily attendance • Percent automobile trips • Vehicle occupancy factor
Method	***Step 1.*** (Daily Attendance) x (Percent Automobile Trips) = Person Trips Via Automobile ***Step 2.*** (Person Trips) / (Vehicle Occupancy Factor) = Vehicle Trips
Result	• Number of vehicle trips by personal automobile both to and from the event

Table 3-17
Market Area Analysis Methods

METHOD	DESCRIPTION
Travel time analysis	• Determine population distribution within travel time threshold of event venue.
Distance analysis	• Determine population distribution within distance radius of event venue.
Origin location analysis	• Determine weighted distribution of known origins by place or zip code.

Figure 3-9 presents a parking demand analysis process used to determine the adequacy of event venue (on-site) parking and the identification of appropriate off-site parking areas. The flowchart denotes an analysis conducted for a one-time interval. Practitioners should perform an iterative parking demand analysis, over hourly time periods as necessary, if considering parking areas characterized by high background parking turnover.

Traffic Demand Analysis

A traffic demand analysis determines: (1) a local area directional distribution and (2) the overall assignment of event-generated traffic. This analysis references results obtained through the travel forecast, market area analysis, and parking demand analysis.

The local area directional distribution indicates freeway ramps and intersections, including turning movements, traversed by event-generated traffic arriving to or departing from a planned special event. The regional directional distribution, as determined in the market area analysis, quantifies the percentage of event patron trips (e.g., origins) by regional freeway and arterial corridor, and the planned special event parking areas, as determined in the parking demand analysis, represent *sink nodes* or location of trip destination.

Traffic demand analysis includes developing composite background and event-generated traffic projections for all roadway system facilities serving the event venue. Composite traffic volumes expressed as an hourly (or sub-hourly) rate meet roadway capacity analysis input requirements. These rates identify the peak hour capacity analysis periods during event patron arrival and/or departure. Practitioners must adjust background traffic volumes to account for displaced and diverted traffic due to road closures required to stage the planned special event.

As a preliminary step to assess the need to perform a detailed roadway capacity analysis, draw a circular screen line (e.g., 0.5 to 1 mile radius) around the event venue site. Note each roadway segment intercepted by the screen line, and estimate the segment's capacity in each direction of travel. Create a chart of hourly composite traffic volumes for each identified segment, and assess capacity deficiencies in both directions of travel.

Roadway Capacity Analysis

A roadway capacity analysis uses traffic demand analysis results to measure the impact of a proposed planned special event on roadway system operations. At the feasibility study level, a roadway capacity analysis references existing roadway facility operations and capacity (e.g., no reverse flow operation or other capacity enhancements). The analysis assumes pedestrian access management strategies will minimize pedestrian/vehicular conflicts, and parking area

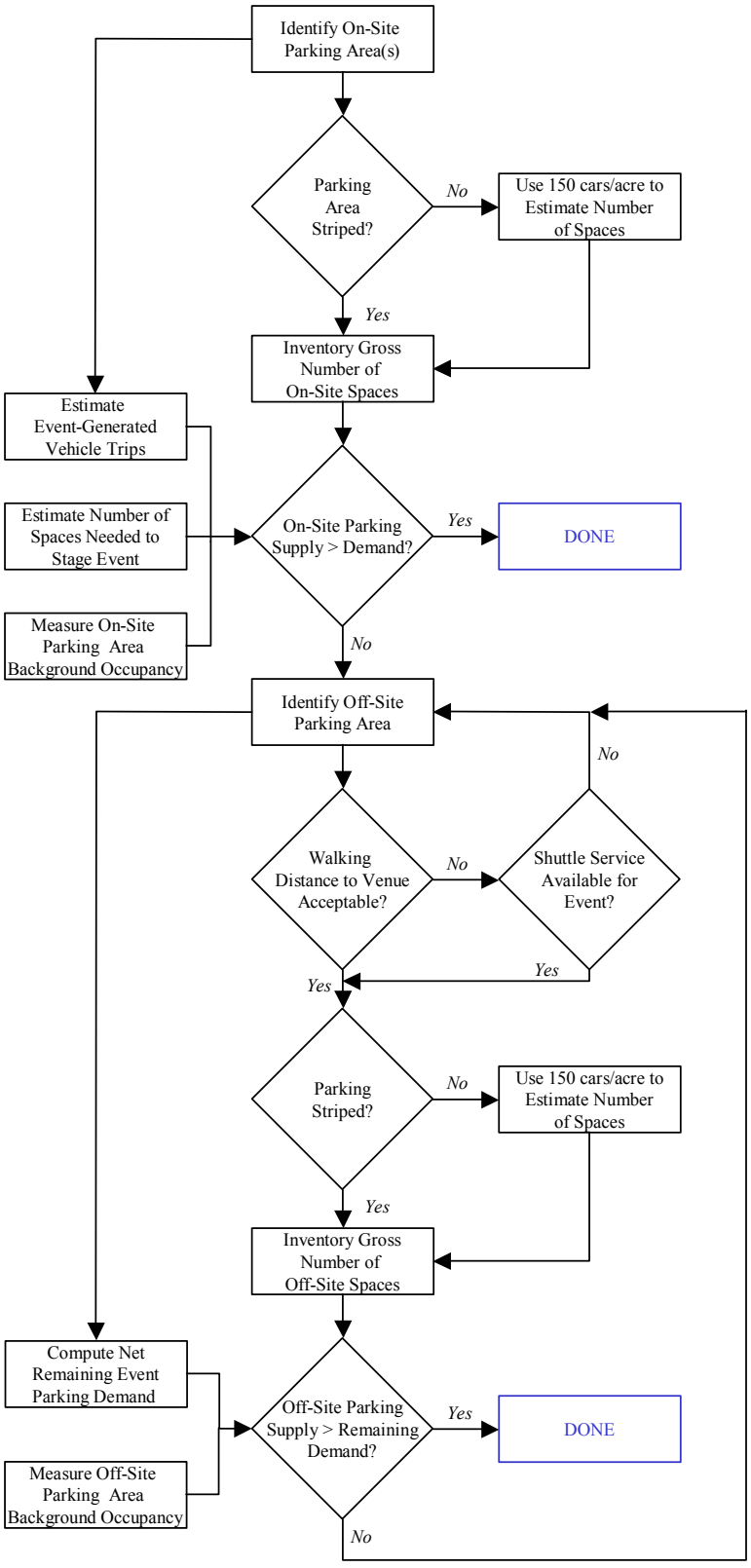

Figure 3-9
Parking Demand Analysis Process

access points provide sufficient service flow rates through proper design. Regardless of capacity analysis outcome, pedestrian accommodation and parking management represent key considerations in a planned special event traffic management plan.

Roadway capacity analysis involves freeway segments, freeway junctions such as ramps and weaving areas, street segments, signalized intersections, and unsignalized intersections. To evaluate these facilities, practitioners can employ one of two approaches: (1) analyze section and point capacity using Highway Capacity Manual recommended methodologies or (2) analyze network operations using a computer traffic simulation model.

Mitigation of Impacts

Mitigating anticipated planned special event impacts on travel represents the ultimate goal of conducting a feasibility study. The mitigation of congestion and potential safety impacts identified through a feasibility study requires development of a traffic management plan and complementing travel demand management strategies. In turn, practitioners can utilize the tools and techniques used to determine feasibility study results in order to evaluate various mitigation strategies and determine if the selected strategies adequately mitigate identified transportation system deficiencies.

Table 3-18 lists numerous tools for mitigating planned special event impacts on local roadway and regional transportation system operations. In meeting the overall travel management goal of *achieving efficiency*, these tools target utilizing the excess capacity of the roadway system, parking facilities, and transit.

Traffic Management Plan

A traffic management plan indicates *how* traffic, parking, and pedestrian operations will be managed on the day-of-event. The plan contains strategies and tactics for mitigating travel impacts identified in a planned special event feasibility study analysis. It also accommodates planned travel demand management initiatives aimed at improving transportation system operations on the day-of-event.

The scope of a traffic management plan varies for each planned special event, even for events happening in the same jurisdiction or region. Different strategies and tactics are successful in handling different categories of planned special events occurring in metropolitan, urban, and rural areas. A successful traffic management plan satisfies both the: (1) customer requirements of all transportation system users and (2) allotted budget for personnel and equipment resources assigned to the day-of-event operation.

The key components of a traffic management plan for planned special events include:

- Site access and parking plan
- Pedestrian access plan
- Traffic flow plan
- Traffic control plan
- En-route traveler information plan
- Traffic surveillance plan
- Traffic incident management and safety plan

Special Considerations

The event planning team must create a flexible traffic management plan that accommodates modifications on the day-of-the-event as well as special considerations

Table 3-18
Tools for Mitigating Planned Special Event Impacts on Transportation System Operations

CATEGORY	EXAMPLE TOOLS
Traffic Control and Capacity Improvements	
Freeway traffic control	• Ramp closures or additional capacity • Alternate routes • Ramp metering
Street traffic control	• Lane control • Alternative lane operations • Road closures • On-street parking restrictions • Trailblazer signing • Parking management systems
Intersection traffic control	• Access and turn restrictions • Advance signing to improve traffic circulation • Traffic signal timing and coordination
Traffic incident management	• Service patrols • Tow truck staging • Advance congestion warning signs • Portable lighting
Traffic Management	
Traffic surveillance	• Closed circuit television systems • Field observation • Aerial observation • Media reports • Portable traffic management systems
En-route traveler information	• Changeable message signs • Highway advisory radio • Media • Static signing • Destination signing
Travel Demand Management	
Transit incentives	• Public transit service expansion • Express bus service from park and ride lots • Charter bus service
High occupancy vehicle incentives	• Preferred parking • Reduced parking cost
Event patron incentives	• Pre-event and post-event activities
Bicyclist accommodation	• Bicycle routes and available parking/lock-up
Local travel demand management	• Background traffic diversion • Truck diversion
Pre-trip traveler information	• Internet • Telephone information systems • Public information campaign • Event and venue transportation guide • Media

that surface prior to the planned special event.

Table 3-19 lists the various groups that either attend or have a direct interest in a planned special event. Throughout the traffic management plan development process, the event planning team must regularly monitor and communicate any special considerations that arise in conjunction with the needs of the groups attending the event.

Table 3-19
Groups Attending a Planned Special Event

GROUP
• Participants
• Spectators
• Event sponsor
• Dignitaries
• Media
• Non-ticketed visitors
• Street vendors

Contingency Planning

Contingency planning represents *event insurance*. While stakeholders may consume additional time and resources during advance planning for a planned special event, the availability of contingency plans helps mitigate a potential systemic breakdown of the transportation system during an unexpected event occurring at or near the same time as the planned special event. Key steps in contingency planning include:

- Develop a traffic management plan that is *scenario-based*.
- Consider and plan for a range of possible unplanned scenarios. Table 3-20 provides a contingency plan checklist for planned special events.
- Determine changes in operation due to unplanned scenarios.

Table 3-20
Contingency Plan Checklist

CONTINGENCY

• Weather
  o Severe weather outbreak
  o Flooding on event site access routes
  o Flooding in event parking areas
  o Parking during wet weather

• Security threat
• Major traffic incident
• Delayed event
• Event cancellation
• Absence of trained personnel and volunteers on the day-of-event
• Equipment breakdown
• Demonstration or protest
• Unruly spectator behavior
• Overcrowding
• Event patron violence

Site Access and Parking Plan

A site access and parking plan contains operations strategies for managing automobile, bus, taxi, and limousine traffic destined to and from the following areas in the vicinity of a planned special event venue: (1) public parking area, (2) reserved (permit) parking area, (3) overflow parking area, and (4) pick-up/drop-off area. The event planning team must create a flexible plan that contains proactive strategies for responding to real-time event patron travel patterns driven by their choice of public parking areas, especially if parking fees vary from lot to lot. Traffic destined to the three other site areas has a fixed ingress and egress pattern as specified in the plan through lot assignments and permitted movements.

Site access and parking plan development involves a three-step process: (1) access, (2) process, and (3) park:

- Access refers to getting event traffic from the adjacent street system to their destination, such as a parking area or

pick-up/drop-off area, during ingress and vice versa during egress. The traffic management team manages the access operations component.

- Process involves activities necessary to "approve" vehicles for entry into a parking area. A fee transaction between a parking area operator and motorist represents a common process activity.
- Park involves handling vehicles from a process point to a parking space. A parking team and associated volunteers operate the process and park components. A breakdown in any one of the three components can result in congestion extending to the adjacent street system and possibly to freeway and arterial corridors serving the planned special event.

In order to facilitate safe and quick spectator and participant travel to/from the event site, the site access and parking plan should specify tactics that prevent potential congestion on parking area access roads and allow for good circulation on roadways surrounding the event site. Table 3-21 indicates site access and circulation considerations applicable to the development of a site access and parking plan.

The objective of designing and operating parking areas involves providing an access point capacity in excess of the peak rate of traffic flow that traverses the driveway. Any planned special event parking area that requires a fee or permit for access has a service facility in-place to process vehicles entering the lot. Therefore, a first-in-first-out queuing system exists.

Queuing happens when the arrival rate exceeds the service rate. The arrival rate denotes the number of vehicles traversing a single parking area access point over some period of time. The service rate is the number of vehicles the service facility can process over some period of time. The magnitude of this rate depends on the number of servers (e.g., staff or automated gates) that comprise the service facility and server efficiency. A parking area queuing system operates stochastically. Traffic arrival rates will vary, and individual transaction times that collectively determine the service rate will also vary. In designing a service facility for a planned special event parking area, select a conservative server service time (e.g., the time to serve one vehicle) and determine the required number of servers that can process the maximum anticipated arrival rate with one server on break.

Table 3-21
Site Access and Circulation Considerations

CONSIDERATION	TACTIC
Parking area ingress	• Right turn circulation pattern • Contraflow operation • Shoulder utilization • Lane channelization • Parking area overflow access points
Pick-ups and drop-offs	• Use of off-street areas • Designation of pick-up/drop-off areas to avoid conflict with primary traffic ingress/egress routes • Storage area
Parking area egress	• Right turn circulation pattern • Preservation of adjacent street flow • Provision of rapid parking area unloading

Parking operators and volunteers must meet the following two requirements for parking vehicles:

- Park vehicles at the same rate as those being processed.
- Minimize pedestrian/vehicular conflicts inside parking areas.

The event planning team should design a site and parking plan to service both the traffic management team and event patrons. Pre-trip traveler information dissemination (via media, websites, mailings, brochures) should include elements of the site and parking plan. Table 3-22 contains a site and parking plan development checklist.

Pedestrian Access Plan

A pedestrian access plan provides for the safe and efficient movement of pedestrians within the immediate area of the venue. This includes accommodating pedestrian trips to/from several mode transfer points in a planned special event activity network. These points include site parking areas, transit stations, express/charter bus stations, shuttle bus stations, and pick-up/drop-off areas. Moreover, some event patrons may make their entire trip, originating from home or work, on foot. In meeting the managing travel for planned special events goal of *ensuring safety*, the event planning team must develop a plan that: (1) accommodates pedestrians accessing an event via a network of safe walking routes and (2) minimizes pedestrian/vehicular conflicts.

A successfully implemented pedestrian access plan for planned special events permits *rapid dispersion* of pedestrian flow. Although high pedestrian volumes encompass the immediate venue area during ingress and egress, the plan effects efficient access through a radial network of pedestrian routes. It also includes time-sensitive strategies to minimize overcrowding conditions at venue gates and mode transfer points. The plan also considers a continuous shuttle bus service operations detail to handle event patrons destined to/from satellite parking areas and transit stations not easily accessible by foot.

Pedestrian access routes are comprised of two components:

- A *routing* component, consisting of sidewalks or paths between street intersections.
- A *crossing* component, consisting of infrastructure or other vehicle control measure that allows pedestrians to cross a street safely.

Planned special event pedestrian management involves the implementation of integrated control tactics to facilitate pedestrian routing and crossing between a mode transfer point and the event venue.

Two strategies for managing pedestrian flow on walkways during planned special events include:

- Locating access route termini.
- Providing additional, temporary pedestrian walkway capacity.

Table 3-23 describes tactics for improving the safety and capacity of pedestrian street crossings. Use of a temporary pedestrian bridge represents an effective tactic for crossing wide streets or roadways where traffic throughput is emphasized. Temporary street closures during event egress allow the venue to empty faster and permits pedestrians to disperse to a number of adjacent mode transfer points and pedestrian access routes. Mid-block crossings not only

Table 3-22
Site and Parking Plan Checklist

ELEMENT	PROVISION
Event patron parking areas	• Highlight free, pay (state rates), and reserved (permit) parking areas. • Indicate lots where tailgating is permitted. • Show specific parking area access points and state restrictions. • Indicate number of entrance/exit lanes (or servers) at each access point. • Designate lots by a number or letter and provide lot-specific directions. • State time parking areas open, particularly if time varies by parking area. • Discuss features of each parking area (e.g., paved, staffed, lighting, security). • State estimated walking time from each parking area. • Indicate connecting pedestrian access routes. • Show overflow parking areas, state distance from venue, and indicate criteria for operation (e.g., sell-out). • Indicate parking areas for motorcycles. • Indicate parking areas for recreational vehicles (e.g., overnight parking). • Furnish map of available off-site parking areas. o Include information on street regulations (e.g., one- or two-way) and connections to freeways and major arterials. o State on-street parking restrictions. o Specify private parking area regulations (e.g., egress control). o Indicate location of entrance/exit points to off-street parking areas. o Include rates if available. o Show restricted off-site parking areas (e.g., residential neighborhoods, etc.)
Gate access information	• Indicate gate names as shown on event patron tickets.
VIP information	• Show VIP (e.g., official guest / sponsor) parking areas. • Show credential pick-up location. • Show hospitality areas.
Shuttle bus route and stations	• Display shuttle route and all stations. • State cost, and emphasize free services.
Drop-off / pick-up sites	• Show access points and circulation lanes for transit/taxi/limo/shuttle service. • Show exclusive bus lanes. • Show transit / express bus stations. • Indicate general drop-off / pick-up sites where turnaround is permitted. • Indicate valet parking drop-off. • Show disabled drop-off / pick-up site.
Other parking areas	• Show express/charter bus parking area. • Show limousine parking area. • Show media parking area. • Show venue employee parking area.
Disabled parking areas	• State specific location (e.g., first row) of disabled-only spaces in general parking areas. • Indicate number of spaces available.
Other considerations	• Show aerial map. • Promote advance purchase (permit) options. • Indicate towed vehicle (e.g., illegally parked) pick-up area. • Emphasize new provisions (e.g., new parking areas, etc.). • Present map in grid format for easy reference. • Prepare maps for different venue events if parking plan varies. • Draw map to scale. • Show private property. • Display landmarks. • Indicate municipal fireworks viewing areas.

Table 3-23
Pedestrian Crossing Tactics

TACTIC	APPLICATION
Temporary pedestrian bridge	• Provides uninterrupted flow. • Achieves total separation of pedestrians and vehicles. • Enhances pedestrian safety.
Street closure	• Provides uninterrupted flow. • Accommodates very heavy pedestrian volume. • Allows pedestrian dispersion. • Requires officer control.
Mid-block street crossing	• Provides interrupted flow. • Avoids pedestrian conflict with turning vehicles. • Requires officer control.
Staffed crossings	• Provides interrupted flow. • Accommodates light pedestrian volume.

reduce the likelihood of vehicle-pedestrian collisions, but accident severity as well.

The pedestrian access plan must accommodate disabled event patrons arriving via all travel modes serving a planned special event. This involves examining all routes that a disabled event patron may traverse and, in turn, ensuring the patron has an unimpeded path from mode transfer point to venue seat. Accessible pedestrian routes must: (1) maintain a minimum path width, (2) include curb cuts and temporary ramps for negotiating grade separations, and (3) conform to local Americans with Disabilities Act (ADA) regulations. If a particular route (e.g., from express/charter bus station or transit station) does not meet accessibility requirements, then accessible shuttles must operate between affected mode transfer points and accessible pick-up/drop-off areas.

A shuttle bus service should be operated continuously within the venue site area during event ingress and egress, with the service schedule revolving around event patron arrivals and departures. Common shuttle service to/from a planned special event venue include: (1) satellite parking area service, (2) transit station service, and (3) employee parking area service. A particular planned special event may involve multiple private and public (e.g., transit agency) shuttle service operators, all of whom must coordinate with the event planning team on service details and station locations. Successful shuttle bus services positively influence the travel mode or destination (e.g., off-site) choice made by persons traveling to and from a planned special event.

The end result in shuttle bus service design involves determining the required number of buses to meet expected ridership levels. Based on event category and associated operations characteristics, the number of shuttle buses needed during event ingress and egress may vary.

A temporary shuttle bus station will exist at both a mode transfer point and at the event venue. Station design and operations should facilitate the rapid loading and unloading of shuttle passengers without impacting adjacent traffic operations and pedestrian movement. Because of the high concentration of pedestrian traffic at the event venue during ingress and egress, venue station design is critical. On-site shuttle bus stations should: (1) facilitate easy shuttle bus access,

(2) provide a defined passenger waiting area, (3) promote an orderly queue formation, and (4) shield waiting passengers from adjacent vehicular and pedestrian traffic.

Table 3-24 lists pertinent pedestrian access plan informational elements of interest to event patrons and participants. A traffic flow map or traffic control plan, prepared as a traveler information tool, may contain callouts to pedestrian facilities and day-of-event control tactics.

Table 3-24
Pedestrian Access Plan Checklist

ELEMENT
• Show recommended pedestrian access routes.
• Show pedestrian bridges and tunnels.
• Indicate special pedestrian crossing tactics (e.g., street closure or mid-block crossings)
• Show shuttle bus route, direction of travel, stop locations, and loading and unloading areas.
• Show vertical connections between infrastructure levels (e.g., stairs, escalator, elevator, ramps).
• Show designated pedestrian crossings at street use event venues.
• Indicate special regulations.
• Highlight pedestrian access routes and crossings suitable for disabled event patrons.

Traffic Flow Plan

The preparation of a traffic flow plan represents a required preliminary step to the design of a traffic control plan. The traffic demand analysis component of a feasibility study indicates the freeway/arterial corridors and local streets that event patrons will utilize to access the venue site area. In developing a traffic flow plan, the event planning team modifies predicted flow routes to maximize transportation system operating efficiency on the day-of-event while meeting public safety agency needs. In turn, a traffic control plan facilitates traffic flow on recommended flow routes through service-enhancing strategies and tactics that handle forecasted event traffic demand on these routes.

The advantage of developing a traffic flow plan is two-fold:

- Allows the event planning team to influence and control event patron patterns of ingress and egress.
- Provides important advance information for event patrons and participants regarding *best access* routes to the event.

The traffic flow plan must account for two types of traffic flow routes: *corridor* and *local*:

- Corridor flow routes include the freeways and major arterial roadways serving the planned special event venue.
- Local flow routes traverse the street system adjacent to the event venue and service a particular parking area or pick-up/drop-off point.
- A *target point* represents the point of connection between corridor and local flow routes, characterized by a freeway interchange or major arterial intersection.
- On the day-of-event, the management of corridor flow routes typically involves surveillance and dissemination of traveler information regarding target point and local flow route operations. The traffic management team implements traffic control initiatives beginning at the target point and continuing along the local flow route.

Figure 3-10 describes a process for assessing corridor and/or local traffic flow routes. Traffic control strategies for increasing corridor route capacity include eliminating weaving areas or other ramp control tactics. Strategies for local routes include striping

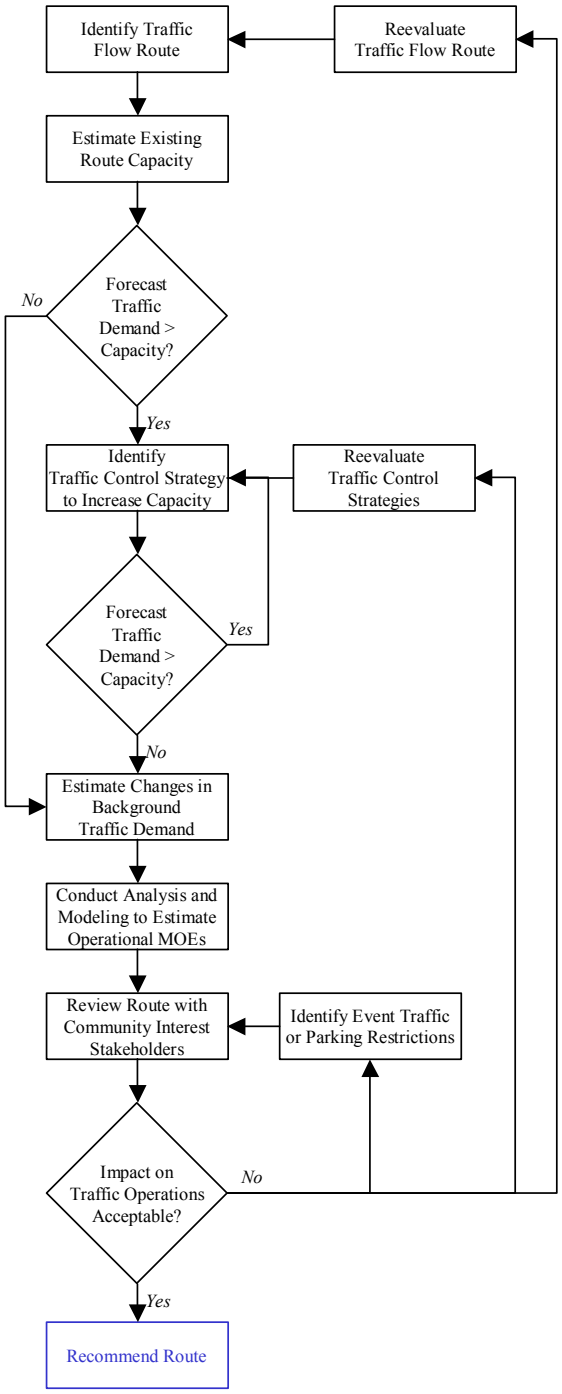

Figure 3-10
Traffic Flow Route Assessment Process

additional travel lanes to handle flow in the predominant direction, restricting turning movements, and revising traffic signal timing plans. The "Traffic Control Plan" section describes these strategies and other mitigation alternatives in greater detail.

Other considerations involved in the development of traffic flow plans include:

- Emergency access routes
- Background traffic accommodation
- Transit accommodation

Emergency access route planning involves designating street closures or emergency access lanes within the venue site area to connect to some or all of the following termini: (1) public safety (e.g., fire and emergency medical service) headquarters, (2) local hospital, (3) freeway or major arterial serving a regional hospital, and (4) location of staged ambulances and first-aid stations for on-site medical treatment.

Table 3-25 presents a range of passive (e.g., traveler information dissemination only) and aggressive (e.g., physical traffic control) tactics for accommodating background traffic during a planned special event.

A traffic management plan that prioritizes bus flow to and from the venue site area positively influences the utility associated with transit and other travel choices involving express bus, charter bus, or shuttle bus transport. Transit agencies should operate on scheduled bus transit routes up until the last possible point to divert around a road closure required to stage a planned special event. This avoids user confusion and minimizes inconvenience to non-event attendees.

Table 3-26 lists tactics for accommodating scheduled and event-generated bus service.

The traffic flow plan serves stakeholders managing the planned special event in addition to event patrons and participants. The

Table 3-25
Tactics for Accommodating Background Traffic during Planned Special Events

USER GROUP	TACTIC	BENEFIT
Regional through traffic	• Freeway-to-freeway diversion beginning a significant distance upstream of an event venue.	• Maintains mobility. • Reduces the level of background traffic on corridor flow routes serving the venue.
Local through traffic	• Arterial-to-arterial diversion	• Eliminates non-attendee exposure to venue site area. • Discourages cruising around site area. • Allows public to become familiar with route after repeated implementation.
Neighborhood residents and businesses	• Parking restrictions	• Permits resident access to on-street parking spaces. • Permits employee and customer access to public parking areas.
	• Traffic control points	• Restricts neighborhood area access to residents and business employees.
	• Signing and alternate routes	• Directs customers to businesses and other traffic generators.

Table 3-26
Bus Accommodation Tactics

TACTIC
• Exclusive bus route • Exclusive/priority bus lane • On-demand communication with TMC or command post

product of strategic route planning involves informing event patrons of best access routes to and from the planned special event. Stakeholders can communicate preferred route directions via: (1) event patron ticket mailings, (2) media public information campaigns, and (3) event, venue, or traffic information websites.

Table 3-27 contains a traffic flow plan development checklist.

Traffic Control Plan

Freeways represent corridor flow routes serving event patrons and participants destined to/from a planned special event from various parts of a region and beyond. These corridor flow routes connect to local, street-level flow routes that, in turn, serve event venue parking areas. A freeway interchange marks the point of connection, or target point, between corridor flow routes and local flow routes. Together, the three entities comprise the roadway system servicing a planned special event. The scope of traffic control expands and contracts, proportionally to system performance, during event ingress and egress.

The main objective of freeway management during planned special events involves minimizing freeway mainline congestion. Freeway traffic control tactics implemented in response to local traffic flow or ramp operation degradation preserve freeway mainline operations. Freeway traffic control and management strategies for planned special events include traveler information dissemination and interchange operations.

Traveler information disseminated upstream of freeway interchanges serving an event venue effectively: (1) introduces all freeway users to critical traffic management plan components affecting traffic flow in the vicinity of the event venue and (2) facilitates freeway lane management as motorists learn of temporary freeway ramp control tactics

Table 3-27
Traffic Flow Plan Checklist

ELEMENT	PROVISION
Event patron corridor flow route	• Indicate recommended freeway ramps, by route direction, to/from event venue or specific parking area. • Indicate corridor target points representing a connection to local flow routes. • State freeway or arterial lane assignments for event traffic (e.g., event traffic two right-lanes). • Furnish information on roadway construction projects, as applicable, and indicate alternate routes. • Indicate modified ramp control tactics (e.g., closures/additional lanes). • Show freeway interchange configurations (and direction of travel) and exit numbers. • State tolls, if applicable.
Event patron local flow route	• Show connection to corridor flow route. • Indicate local streets that connect to freeway entrance/exit ramps. • Indicate recommended flow route to/from general and reserved parking areas (minimum) or individual parking areas (recommended). • Indicate one-way streets. • Show all road segment closures. • Specify permitted turning movements. • Emphasize controlled turn areas (turns prohibited or only one turn allowed). • List modified roadway striping (e.g., reversible lanes or contra-flow). • Indicate event participant/VIP access routes.
Traveler information	• Promote use of regional park & ride locations and event satellite parking areas. • Indicate commercial radio and highway advisory radio frequencies with event travel information. • Alert motorists of static and changeable message sign guidance along route. • Stress importance of following route and adhering to traffic control officer instructions.
Traffic management team information	• Include contingency maps detailing routes to overflow parking areas. • Provide written directions for diverting corridor flow routes via local street system. • Indicate alternate routes for ingress and egress to same target point.
Other travel modes / user groups	• Show transit routes and state corresponding route number(s). • Show preferred taxi routes. • Indicate bicycle routes. • Indicate pedestrian routes.
Other considerations	• Provide information on both ingress and egress flow routes. • Emphasize law enforcement endorsement of recommended routes and directions. • State travel times (by mode of travel) and distances (e.g., from select origins) • State when special traffic flow routes go into effect and terminate. • Disseminate written ingress/egress driving directions. • Indicate potential points of confusion (“do not take”) along recommended route (e.g., freeway exits, turning movements). • Indicate heavy vehicle restrictions. • Indicate expected congested/non-congested areas. • Use callouts to highlight critical movements. • Label all streets and freeways. • Color-code recommended routes to specific parking areas. • Emphasize new provisions (e.g., new road closures or route). • Prepare maps for different venue events if parking plan varies. • Show parking areas. • Show venue gates. • Draw map to scale. • Show private property. • Display landmarks.

and/or downstream lane closures that warrant a lane-change.

Management of freeway interchange operations for planned special events involves maximizing ramp capacity and preventing freeway mainline congestion. Table 3-28 presents interchange operations tactics for planned special events.

The central traffic control strategy for local flow routes serving a planned special event involves *emphasizing throughput*. Tactics that increase street capacity include a combination of: (1) on-street parking restrictions, (2) vehicle travel on road shoulders, and (3) alternative lane operations. Streets connecting freeway/arterial corridor routes and venue parking areas characteristically serve a predominant directional traffic flow during ingress and the reverse flow during egress.

Alternative lane operations comprise two categories:

- Reversible lane operation
- Contraflow operation

The application of alternative lane operations to streets during a planned special event creates an express route between an event venue and high-capacity freeway/arterial corridors. Three key elements in developing an alternative lane operations plan include lane balance, markings, and enforcement.

The management of traffic traversing a local flow route on the day-of-event involves route guidance and monitoring of traffic control initiatives.

The event planning team should design special route marker signs for guiding motorists to venue parking areas and pick-up/drop-off locations. Each route marker may consist of a color-coded letter or symbol. When erected along a local flow route, the route marker assemblies collectively trailblaze a route to the drivers' destination of choice. Signs that introduce each route marker should be placed on all freeway and arterial corridors serving the event venue.

The deployment of a portable traffic management system(s) (PTMS) provides a traffic management team with the capability of monitoring traffic operations at critical roadway system locations in addition to disseminating updated traveler information at that location. Critical locations include target points connecting a corridor flow route and a local flow route or key driver decision points on the street network surrounding an event venue. Typical PTMS components include:

- Surveillance camera
- Changeable message sign
- Highway advisory radio
- Detection devices
- Weather sensor
- Flood lights
- Power source (e.g., solar)

Wireless communication via spread spectrum radio enables the traffic management team to view full-motion video from PTMS surveillance cameras.

A proactive approach toward developing strategies for controlling intersection traffic during a planned special event aims to:

- Increase intersection traffic handling capacity.
- Improve the orderly movement of traffic.
- Prevent crash occurrences.

Table 3-28
Interchange Operations Tactics for Planned Special Events

TACTIC	EVENT TIME	APPLICATION	BENEFIT
Rolling road block	Ingress	• Initiate tactic on freeway mainline upstream of congested interchange ramp(s).	• Alleviates traffic demand at interchange, thus permitting street or ramp bottleneck to dissipate.
	Egress	• Initiate tactic on freeway mainline upstream of a congested ramp junction or weaving area. • Use tactic to meter freeway mainline traffic demand without creating a secondary bottleneck upstream of the congested area.	• Reduces level of congestion at the primary bottleneck location.
Entrance ramp closure	Ingress	• Initiate tactic on ramps in close proximity to and upstream of interchange target point for event traffic. • Divert affected traffic to another downstream access point.	• Eliminates congestion caused by traffic merging with heavy freeway mainline traffic.
	Egress	• Initiate tactic as necessary to reduce freeway mainline congestion in the vicinity of closely spaced entrance ramps.	• Reduces freeway mainline congestion or prevents congestion from occurring.
Exit ramp closure	Ingress	• Close ramp, as needed, to alleviate congestion on a downstream local flow route. • Initiate only if a downstream exit ramp and local street system can handle diverted traffic.	• Reduces congestion on local flow route.
	Egress	• Initiate tactic at freeway interchanges connecting local traffic flow routes that have special egress traffic control measures in effect.	• Prevents traffic from accessing local flow routes in the direction of the event venue that operate in favor of egress traffic flow.
Elimination of weaving area	Ingress	• Close cloverleaf interchange entrance ramp to facilitate unimpeded diverge to access adjacent exit ramp.	• Eliminates weaving area congestion. • Extends deceleration lane for traffic using exit ramp.
	Egress	• Close cloverleaf interchange exit ramp and mainline right-lane to facilitate unimpeded merge with mainline.	• Eliminates weaving area congestion. • Extends acceleration lane for traffic using entrance ramp.
Ramp metering	Ingress	• Meter freeway entrance ramps upstream of interchange target point for event traffic.	• Reduces congestion caused by traffic merging with heavy freeway mainline traffic.
	Egress	• Meter freeway entrance ramps downstream of interchange target point for event traffic	• Reduces congestion caused by traffic merging with heavy freeway mainline traffic.
Late diverge prohibition	Ingress	• Deploy traffic cones along barrier line extending upstream of exit ramp gore area.	• Reduces congestion at diverge ramp junction caused by motorists attempting to make a sudden lane-change to access an exit ramp. • Improves safety.
Additional exit ramp lane	Ingress	• Cone an additional lane on exit ramps serving traffic destined to an event venue.	• Provides additional ramp storage capacity. • Proves particularly effective if two-lane ramp traffic does not have to merge at downstream end of ramp.

The key to maximizing capacity involves simplifying traffic movements and minimizing the number of traffic signal phases. Stakeholders can also reduce the number of competing intersection traffic flow movements by initiating a planned road closure. Advance signing of permitted intersection movements improves the orderly movement of traffic.

The significant change in traffic volume and flow patterns at street intersections in the vicinity of a planned special event venue during event ingress and egress mandates a review of traffic signal timing plans during the event operations planning phase. Advance traffic signal operations planning involve developing event traffic signal timing plans. Traffic signal timing plans should exist for a range of contingency scenarios that prioritize either major street or minor street traffic movements. Methods to increase time for a specific movement include: (1) selecting an existing plan with a longer cycle length to increase the normal favored phase, (2) implementing a custom plan favoring a minor street phase (3) deploying a contingency "flush" plan, consisting of an extra long phase or cycle, to facilitate movement through a corridor, and (4) increasing time for a movement through manual traffic signal system operator control. In traffic signal system-controlled corridors carrying high traffic volumes on the day-of-event, system operators may enact simultaneous coordination, where all signals within a single corridor turn green at the same time.

The event planning team designs traffic control plans for use by the traffic management team and traffic control vendors. Table 3-29 contains a traffic control plan development checklist for freeway, street, and intersection management.

En-Route Traveler Information Plan

En-route traveler information can provide event patrons and other transportation system users with current roadway and transit information while traveling en-route. Information is typically provided via devices deployed along the side of the roadway, or from devices mounted on the dashboard of the vehicle. Along the roadway, CMS and HAR messages typically provide information regarding an upcoming planned special event, including current conditions related to the special event such as traffic congestion, incident and construction locations, weather advisories, parking availability, and alternate routes. In-vehicle and personal mobile devices can provide a variety of en-route traveler information to both the traveler as well as transportation providers.

Static signs can be used for event management to inform travelers of an upcoming planned special event, to identify park & ride lots, and to guide motorists to particular locations. It is not uncommon for agencies to use static signing in special event management for the following purposes:

- Notify travelers of a future special event.
- Notify travelers of future facility changes for the event such as lane closures or occupancy restrictions.
- Identify special alternate routes for the event.
- Guide travelers to parking or park & ride lots.

One of the most fundamental technologies available for disseminating traffic-related information from the roadside is that of changeable message signs. CMSs are sometimes referred to as dynamic message signs

Table 3-29
Traffic Control Plan Checklist

ELEMENT	PROVISION
Freeway control plan	• Specify maintenance and protection of traffic per MUTCD guidelines (e.g., location of traffic control equipment, equipment quantities, and safety signs). • Indicate ramp control and capacity modifications. • Highlight exclusive traffic flows (e.g., unimpeded merge, etc.). • Dimension weaving area, acceleration/deceleration lane lengths, ramp length. • Indicate potential bottleneck locations for surveillance monitoring.
Street control plan	• Show closed road segments. • Indicate directional lane control (e.g., alternative lane operations). • Show one-way streets. • Indicate number of ingress and egress lanes at each venue access point (e.g., parking areas, pick-up/drop-off points). • Show street use event route. • Indicate parking restrictions. • Indicate location of command post(s). • Integrate with signing plan (e.g., show route trailblazer signs).
Intersection control plan	• Specify maintenance and protection of traffic per MUTCD guidelines (e.g., location of traffic control equipment, equipment quantities, and safety signs). • Show permitted pedestrian movements and crosswalk locations. • Indicate approach lane designations and pavement markings. • Indicate traffic control. • Highlight exclusive/permitted traffic flows (indicate approach lane and corresponding receiving lane). • State special regulations (e.g., turn prohibition, exclusive bus lane, resident/permit only movement). • Show approach closures. • Indicate parking restrictions. • Indicate location of traffic control officers. • Indicate location of equipment storage area at intersection.

Signing plan	• Show location of permanent/portable changeable message signs.
	• Show location of permanent/portable highway advisory radio stations.
	• Indicate CMS/HAR message sets.
	  o Default ingress and egress
	  o Contingency scenarios
	• Show location of temporary static signs and message.
	• Indicate location of dynamic blank-out signs.

Equipment location plan	• State number of traffic cones, drums, and barricades required at designated locations. o Indicate equipment staging areas (e.g., shoulder, median, intersection corner) • Indicate location of equipment storage areas.
Other considerations	• Provide plans for both ingress and egress operation. • Indicate roadway construction zones. • Include table of quantities. • Show aerial map. • Draw map to scale. • Display landmarks.

or variable message signs. CMSs are programmable traffic control devices that can usually display any combination of characters to present messages to motorists. These signs are either: (1) permanently installed above or on the side of the roadway, (2) portable devices attached to a trailer, or (3) portable devices mounted directly on a truck and driven to a desired location.

Highway advisory radio is an effective tool for providing timely traffic and travel condition information to the public. It has various advantages and disadvantages. Its most important advantage is that it can reach more travelers, or potential travelers, than the other roadside technology, changeable message signs. While CMSs reach only those motorists at a particular point, and can only convey a short message, HAR has the advantage of being able to communicate with any person in the HAR broadcast range. Furthermore, the amount of information that can be conveyed to the user is much greater. Its primary disadvantage is that it is restricted to low power, and this can lead to poor signal quality (since many outside forces affect the signal, such as weather) and, therefore, poor listener levels.

The public has learned to depend upon the media to provide them with "almost" real-time traffic information. Commercial radio has proven to be a good means of providing travelers with traffic information both in and out of their vehicles. It is not uncommon for planned special event stakeholders, including public agencies, to partner with a commercial radio station (or for a commercial radio station to sponsor a special event) to enhance the information dissemination related to the event and its transportation conditions. Care should be taken to ensure that the information disseminated reflects current traffic conditions and is credible.

Other technology applications include:

- Cellular telephone-based systems
- 511
- In-vehicle displays
- Subscription services
- Personal data assistants

An en-route traveler information plan must be developed in concert with the traffic flow plan and traffic control plan. The success of any traffic management plan depends on disseminating correct information to motorists at the right time and location.

Detailed plans are necessary that identify the facilities and resources to be used. For instance, what permanent CMS or HAR are to be used and what holes exist in the information dissemination strategy? Where will portable devices be required? Traveler information plans must include planned message sets for equipment and technology used to disseminate en-route traveler information, including static signs, changeable message signs, highway advisory radio, and telephone information systems.

Traffic Surveillance Plan

A traffic surveillance plan can include:

- Closed-circuit television systems
- Field observation
- Aerial observation
- Media reports

Closed-circuit television surveillance is a very valuable planned special event management tool for observing real-time conditions related to special event corridors, alternate routes, parking and pedestrian conditions, as well as for a verification tool for messages placed on changeable message signs.

A common and efficient technique to observe the traffic conditions during a planned special event is to place human observers, or detectors, in the field, usually at critical locations. Normally, these observers have the role of monitoring conditions and reporting back to a central location for strategic assessment. These human detectors are gathering relevant information related to the event and using established protocol to communicate the information back to the central processing and coordination facility.

It is common to deploy these observers where technology is lacking and where they may perform an additional role in traffic management or traffic incident management (e.g., freeway service patrol operators).

Aerial surveillance has long been used to monitor the operation of the surface transportation network. "Observers" in aircraft (fixed wing or helicopters) fly over freeways and streets and monitor conditions in real-time, using two-way radios to communicate with the TMC or with service patrols on the freeway. This approach can be relatively expensive when one considers the expense of leasing or operating an aircraft, although it does have the benefit of being able to cover a large area.

The media needs to be a partner in the planned special event management and operations effort. Agreements must be in place that define their role within the plan, as well as what information needs to be communicated, both prior to and during the event.

Traffic Incident Management and Safety Plan

The occurrence of a planned special event that increases or disrupts the normal flow of traffic places a premium on the optimal use of existing facilities. A traffic incident and safety plan specifies crash prevention tactics and traffic incident quick clearance initiatives, some of which denote special provisions enacted just for the day-of-event. These traffic incident management techniques preserve two goals of managing travel for planned special events: (1) ensuring safety and (2) maximizing efficiency.

Crash prevention tactics focus on improving driver awareness of surroundings and driver behavior. Table 3-30 lists crash prevention tactics applicable to planned special events.

Table 3-30
Crash Prevention Tactics

TACTIC
• Portable lighting
• Congestion warning sign
• Public information safety campaign
• Enforcement

Portable lighting devices enhance driver understanding of traffic control and traffic flow patterns at night. Congestion warning signs, placed upstream of known roadway bottleneck locations, alert drivers of demand-induced congestion on the day-of-event. A public information safety campaign strives to change motorists' behavior when traveling to and from a planned special event by emphasizing event traffic control and regulations, pedestrian safety, and vehicle operation. Enforcement aims at preventing drivers from executing illegal and dangerous movements in an effort to bypass congestion and/or day-of-event traffic control.

Service patrols can play a key role in traffic incident management for planned special events. The service has great versatility, and patrol operators can satisfy a wide range of traffic management team needs. For example, operators can assist in establishing day-of-event traffic control, performing traffic surveillance, providing timely traffic condi-

tion reports from various remote locations, and rapidly clearing traffic incidents.

A quick clearance practice consists of laws, policies, procedures, and infrastructure aimed at effecting the safe and timely removal of a traffic incident. Service patrols, as previously described, represent a quick clearance infrastructure component. Rapid clearance of traffic incidents during planned special event ingress and egress avoids significant impact to corridor and local traffic flow routes in addition to routes used by participants and VIPs.

The following quick clearance initiatives benefit traffic incident management in high-volume corridors, characteristic of planned special events: (1) vehicle/cargo removal laws and policies, (2) stakeholder open roads policy, and (3) public-private towing contracts.

Travel Demand Management and Traveler Information

Travel demand management represents a key component of the overall advance planning process when forecasted traffic demand levels approach or exceed available road capacity. TDM strategies may be warranted for planned special events occurring during peak travel times, continuous events located in downtown areas, street use events of long duration, regional/multi-venue events, and special events in rural areas having limited transportation system capacity. The goal is to optimize event patron and non-attendee travel through incentives aimed at consolidating person trips and altering user travel patterns and habits, while minimizing any penalties to the user.

The goal of transit operators involve designing a special event service and related incentives to not only improve the travel choice utility associated with using transit, but also to exceed the utility (e.g., travel time, parking fees, comfort, etc.) associated with traveling via personal automobile. Successful transit services collectively may result in a significant change in event patron modal split without impacting service to non-attendee users.

The availability of pre-trip travel information, consisting of essential event operations and real-time traffic information, proves effective in assisting event patron evaluation of potential travel options, trip departure times, and travel routes to the event venue. Similarly, other road users, seeking to minimize event-related impacts to their trip, value this information.

TDM, transit, and pre-trip traveler information initiatives complement one another and work to reduce traffic on the roadway network in the vicinity of the event. These initiatives are not infrastructure improvements to increase capacity, but rather are methods that decrease vehicular traffic by providing event patrons with various travel choices as well as providing information that may lead to a reduction in traffic volumes.

Demand Management Strategies

Successful TDM strategies, developed to reduce the amount of event patron traffic, encourage carpooling and the use of alternate travel modes. TDM strategies may also influence the travel patterns of non-attendee road users by encouraging a trip time shift or a change in travel mode. The resulting reduction in traffic demand reduces travel times for both event patrons and non-attendee road users.

Table 3-31 contains a summary of travel demand management strategies.

Table 3-31
Travel Demand Management Strategies

STRATEGY	DESCRIPTION	TECHNIQUES	USER GROUP
High occupancy vehicle (HOV) incentives	• Increase the number of persons traveling in each vehicle.	• Consider continuing HOV restrictions on HOV lanes to later weekday hours, or even into weekend hours, in order to encourage event patrons to carpool. • Reduce parking fees for vehicles with more than two people. • Provide free advertising for private lots to balance discounts given for HOV parking.	• Event patrons • Non-attendee road users
Event patron incentives	• Encourage event patrons to arrive early or leave late in order to reduce peak traffic demand.	• Consider departure strategies that encourage spectators to stay late after an event: o Post-event fireworks or concert o Special programming on stadium video screens o "Meet the mascot" promotion for children o Special discount with a ticket stub at nearby restaurants and pubs o Extended parking, at no additional cost, for event goers to encourage their patronage of downtown restaurants and shops after an event. • Consider arrival strategies that encourage spectators to arrive early before an event: o Registration in free drawings and contests that occur before the event o Early opening of venue restaurants and/or offering of special discounts o Tailgating encouraged in venue parking areas o Encouraging spectators to watch teams warm-up before the game	• Event patrons
Bicyclist accommodation	• Encourage the use of bicycles in traveling to/from the event.	• Provide proper bicycle paths (existing and temporary). o Maximization of safety for bicyclists o Avoidance of roadways with higher traffic volumes due to the event • Provide security in bicycle parking areas. o Staffing to prevent bicycle theft • Locate bicycle parking close to venue entrance. • Provide bicycle racks on transit buses to allow spectators to access mass transit while carrying a bicycle.	• Event patrons
Local travel demand management	• Increase the use of public transit. • Encourage car pools. • Shift work hours. • Shift commercial truck travel routes and delivery schedules.	• Encourage alternate travel choices. o Avoidance of travel during times of event ingress and egress o Avoidance of travel near event venue • Encourage businesses to implement TDM strategies. o Telecommuting o Carpooling o Flexible hours o Modified delivery schedules o Early release from work on event dates for infrequent night events • Use media to announce alternate routes to and around the event. • Contact commercial trucking companies. o Times to avoid routes serving the event venue o Reduction of number of truck trips o Shifting of some truck trips to nighttime (non-event) hours.	• Non-attendee road users

Transit Service

Modifications to existing transit service for a special event represent TDM strategies. The focus of the public transit agency is to increase ridership during the event by increasing the attractiveness of the service that it provides. In many locations and for many types of special events, additional ridership to and from special event sites can provide substantial additional revenue for the transit system at little additional cost. Also, transit system use may relieve traffic congestion around the venue.

Table 3-32 contains a summary of transit service strategies.

Pre-Trip Traveler Information

Various traveler information techniques are used to disseminate information to the public, including both event patrons and non-attendee road users, so they can be better informed when planning their trip to a planned special event, or around an event. Table 3-33 lists techniques used to provide pre-trip information to the traveling public.

The primary function of pre-trip information involves assisting drivers with decisions regarding route planning, travel mode, and the time of day to travel. Accurate pre-trip travel information will provide benefits to all transportation system users in the form of time and cost savings.

Pertinent information that event patrons may want before beginning their trip include:

- Best driving route to the venue from specific origins (e.g., cities or freeways)
- Best public transit route
- Parking area locations and parking fees, access to disabled parking spaces, and times that the parking areas open before the event
- Recommended event ingress and egress routes, particularly if different for arrivals and departures

Table 3-32
Transit Service Strategies

STRATEGY	TECHNIQUES
Public transit service expansion	• Maximize use of public transit. o Existing service with additional vehicle hours o Modifying existing service by creating a route deviation with a stop near the event venue o Implementation of an express service to establish a special purpose route to and from the event site
Express bus service	• Discourage event patrons from driving their vehicles to the event site due to expected site parking deficiencies and anticipated roadway congestion. o Using express bus service between a park and ride facility or remote parking lot and event venue o Using park and ride lots that best intercept spectator traffic as it approaches the event site.
Charter service	• Use a contract service to provide transportation directly to the event site from outlying areas (e.g., other neighborhoods and cities). • Consider both charter bus operations as well as charter rail service.
Transit service marketing	• Establish a comprehensive transit marketing program. o Informing the public of the availability of public transit service to/from the event venue o Convincing the public to use the service

Table 3-33
Pre-Trip Traveler Information
Dissemination Techniques

TECHNIQUE
• Internet • Telephone information systems • Public information campaign • Event and venue transportation guide • Kiosks • Television • Newspapers • Changeable massage signs • Highway advisory radio

- Up-to-the-minute roadway information (e.g., current traffic conditions and weather conditions)
- Estimated travel time by different travel modes
- Event information such as times and schedules
- Recommended speed/safety advisories
- Scheduled roadway construction and maintenance lane closures
- On-street parking restrictions during the event
- Heavy vehicle restrictions
- Expected delays leaving the event

IMPLEMENTATION ACTIVITIES

Implementation activities mark a transition phase between event operations planning and day-of-event activities. Therefore, the phase involves both the event planning team and traffic management team. This phase includes activities key to the success of any planned special event, including implementation plan development, stakeholder review and testing exercises, and personnel resource management and training. The underlying objectives of these activities are to: (1) improve the efficiency of traffic management plan deployment and (2) increase traffic management team preparedness. In turn, this creates a more responsive traffic management team and fluid team operation, thus translating to better transportation system performance on the day-of-event.

Implementation Plan

An implementation plan details the actions required to put a traffic management plan into effect on the day-of-event. Its purpose is to: (1) define personnel assignments that indicate the roles and responsibilities of individual traffic management team personnel on the day-of-event, (2) describe a scenario-based, operations *game plan* at the management-level, and (3) communicate instructions and organize personnel at the field-level. It is intended for use by individual traffic management team personnel at the command post and in the field. While the traffic management plan indicates *how* traffic, parking, and pedestrian operations will be managed, the implementation plan describes the *what, when,* and *where* in terms of personnel and equipment resource deployment needed to execute traffic management plan provisions.

Table 3-34 presents an implementation plan checklist. All planned actions, even if not explicitly noted in the table, must include what, when, and where instructions. For multi-day or multi-venue events, traffic control strategies and resource deployment can be organized through matrices for easy reference.

Review and Testing

Review and testing allows the traffic management team to identify potential limitations of the traffic management plan *prior to* the day-of-event. With stakeholder agencies representing various jurisdictions and disciplines, review and testing promotes traffic management team coordination and in-

Table 3-34
Implementation Plan Checklist

ELEMENT	ACTION
Command post operation	• Indicate agencies staffing the command post in addition to the name and schedule of agency representatives. • Specify equipment needs and times of delivery and set-up. o Computers, networking, temporary phone and modem lines, televisions and radios, dry erase board or flipchart(s), message board, office supplies, furniture. • Indicate procedures for accessing the command post (e.g., clearing security) • Specify vehicle parking area and helicopter landing area.
Operations timeline	• Indicate command post location and hours of operation. • State parking, traffic control, and service patrol shifts. • State when egress plan goes into effect. • Specify parking area and venue gate open/close times. • Summarize the location and time (close/reopen) of planned full/partial road closures. • Include event schedule, such as event start time, event end time, and significant activities during the event (e.g., parade detail and headline entertainment schedule). • State times of sunrise and sunset, if applicable to traffic control measures (e.g., use of portable lighting).
Operations management	• Indicate scenario-based criteria for implementing traffic management plan components (e.g., traveler information message sets, traffic flow routing, reversible lane operations, etc.) • Include a series of operations details for sequential time segments on the day-of-event. • Specify contingency plans – indicate available plans and associated equipment/personnel resource deployments and changes in traffic management team command. • Indicate procedure for revising the traffic management plan on the day-of-event. • State protocol for terminating traffic and parking management detail. • Summarize traffic management plan changes since previous event.
Contact information	• State contact information for individual traffic management team members. o Home phone, work phone, cell phone, pager number, fax number, e-mail address, unit/radio assignment, rank, detail assignment, vehicle assignment. • Include contact information for agencies involved in contingency plan deployment.
Communications	• List radio call-sign of traffic management team members. • Indicate guidelines and restrictions regarding use of various radio channels or talkgroups (e.g., field-to-field communications, field-to-command post communications, non-event communications).
Traffic management team organization	• State agency duties, responsibilities (e.g., traffic control, traffic signal operation, traveler information device operation, etc.), and jurisdiction. • Specify highest-ranking agency representative on the day-of-event in addition to mid-level (e.g., zone) managers. • Summarize chain of command.
Equipment and infrastructure management	• Mandate pre-event equipment check (e.g., CMS operation). • Specify locations and quantities of traffic control and other support (e.g., portable lighting) equipment. Indicate equipment owner and, if applicable, power source. • Indicate equipment delivery, installation, and removal schedule in addition to personnel assignments. • Indicate schedule and location (zone) assignment of available equipment maintenance crews on the day-of-event. • Include equipment operating instructions (e.g., remote HAR programming). • Indicate temporary static sign locations and descriptions. • Specify planned traveler information message sets (e.g., CMS and HAR). • Specify personnel responsible for monitoring and programming traveler information devices on the day-of-event.

Table 3-34 (cont'd)
Implementation Plan Checklist

ELEMENT	ACTION
Equipment and infrastructure management (cont'd)	• Indicate protocol and personnel charged with implementing different traffic signal timing plans as needed on the day-of-event. • Indicate protocol and personnel charged with monitoring traffic surveillance equipment (e.g., CCTV). • List available maintenance personnel and equipment resources.
Location-specific traffic and pedestrian control	• Indicate agency personnel (e.g., number of staff or individual name, rank, and unit/radio assignment), report date and time. • Specify schedule and route of roving service patrols. • State protocol and personnel assignments for maintaining unobstructed emergency access routes. • Specify task instructions, including traffic and pedestrian flow restrictions and permitted movements (e.g., special allowances for local traffic, buses, etc.). • Summarize the location and time (close/reopen) of planned full/partial road closures encompassing a particular location. • Provide step-by-step directions in order for substitute personnel to quickly learn protocol. • Include explanation, supplemented with graphics, of special event parking area permits and event passes.
Post-event evaluation	• Describe components of post-event field personnel debriefing. o Time of heavy traffic and pedestrian flow o Qualitative assessment of traffic and pedestrian operations at location. o Recommendations to improve traffic and/or pedestrian flow at location

creases stakeholder familiarity of the duties, responsibilities, and capabilities of other stakeholders.

While a traffic management plan can cover many contingencies, it cannot cover all possibilities. Review and testing can allow participants to see how they handle various scenarios and how varying elements can affect the plan. The testing of the plan should be considered part of the overall training that is needed for traffic management team personnel to become familiar with the plan and their role in it.

Stakeholder Simulation Exercises

The simulation exercise can test important elements such as: (1) interagency communications, (2) deployment of personnel and equipment, and (3) information gathering and dissemination. While stakeholders may conduct the exercise at the venue where the planned special event will occur, much of the plan will involve permanent TMCs or temporary command posts which are in operation before, during, and after the event. Therefore it is important that all of the responsible agencies and TMCs, which may have a role to play during the actual event, be involved with the simulation exercise.

Exercises can take on two different forms:

- A tabletop exercise
- A full-scale simulation

The purpose of both types of exercises is to: (1) test the written assumptions in the traffic management plan and (2) see what must be changed and how the plan can be improved. No matter how thorough a traffic management plan may be, it can not account for all contingencies. The plan assumes participants will follow the steps laid-out, but individuals make mistakes and equipment may

fail. Both the tabletop and full-scale simulation allow the participants to see how they react to those unexpected events.

In both a tabletop exercise and a full-scale simulation, participants receive and use the written traffic management plan and implementation plan as the basis for their actions. Table 3-35 lists elements of a typical exercise.

Table 3-35
Elements of a Stakeholder Simulation Exercise

ELEMENT
• Identify the stakeholders who will participate in the exercise. • Distribute copies of the traffic management plan and implementation plan to participants. • Develop a script for the exercise, including surprise elements, which may not be addressed in the traffic management plan. • Provide a timeline for the exercise to play-out (the exercise will probably take place in an accelerated timeframe compared to a real-life event). • Identify reviewers who will watch the exercise and take notes. • Provide time to review the exercise. • Modify the plan based on what was learned during the exercise.

Equipment Testing

A wide variety of equipment may be used to manage travel during a planned special event. This includes communications equipment and equipment in the field, which supports the traffic management plan and helps the traffic management team manage the event. Equipment that may need to be tested includes:

- Center to center communications
- Center to field communications
- Changeable message signs, both fixed and portable
- Highway advisory radio
- CCTV

While testing is no guarantee that equipment will work as expected, it is useful in identifying unknown problems and potential problems before the event.

Personnel

Traffic management plan implementation on the day-of-event involves personnel duties ranging from trivial tasks to responsibilities critical to the safety and mobility of transportation system users. A traffic management team comprised of supervisors and field staff having experience in assigned duties and responsibilities represents a key to successfully managing travel for planned special events. Experienced personnel should exist at all levels in the traffic management team hierarchy: interagency command, agency command, and field operations. However, supplementing experienced personnel with temporary staff and volunteers on the day-of-event also provides advantages that (1) reduce personnel cost as public agency personnel likely require overtime wages on the day-of-event, (2) permit public agencies to adequately meet other daily staffing requirements, and (3) provide expanded control over transportation operations and greater convenience to event patrons.

In some cases, the amount of personnel required to implement traffic management plan strategies (e.g., traffic/pedestrian control, parking, surveillance) on the day-of-event, coupled with implementation plan assignments such as equipment delivery and installation, may exceed the staffing capabilities of agencies and contractors involved in managing travel for a planned special event. As a result, the recruitment and training of temporary staff and volunteers becomes paramount to the success of day-of-event operations.

Volunteer Recruitment

Prior to initiating volunteer recruiting efforts, event planning team and/or traffic management team stakeholders must determine the number of volunteers needed. This represents a function of the number of potential volunteer work assignments and number of available volunteer supervisors. An alternative approach to recruiting after traffic management plan development involves: (1) soliciting the public, through event advertisements, for volunteers early in the event operations planning phase and (2) developing a volunteer contact list for later reference as conditions warrant.

Because different special event work assignments peak varying levels of interest among volunteers, stakeholders should recruit additional volunteers for certain low-interest assignments. This avoids a potential shortfall relative to volunteers not showing up for work on the day-of-event.

Training Activities

Training for volunteers and temporary staff ensure these personnel: (1) understand the traffic management plan component governing their assignment, (2) disseminate accurate information to event patrons and supervisors, and (3) understand traffic management team operations protocol. Training involves the distribution of reference material, pre-event seminars, or both.

Table 3-36 lists general volunteer training activities. Since most volunteers do not possess relevant experience in managing transportation and parking operations, training activities should address all of the potential decision-making scenarios that volunteers may encounter in addition to day-of-event communications.

Table 3-36
General Volunteer Training Activities

ACTION
• Discuss traffic management team chain of command.
• Summarize job training and required duties.
• Schedule review.
• Present examples of typical and contingency scenarios and how volunteers should react.
• Provide background in customer service.
• Describe field communications infrastructure.
• Discuss proper radio communications protocol.
• Explain types of parking area permits and event passes.
• Discuss strategies for accommodating persons with disabilities (e.g., review disabled accessible routes and site facilities).
• Review security guidelines.
• Review guidelines for interacting with the media.
• Indicate transportation information and alternatives for volunteer access to event venue site.

DAY-OF-EVENT ACTIVITIES

Day-of-event activities focus on the daily implementation of the traffic management plan in addition to traffic monitoring. The traffic management team represents a distinct stakeholder group charged with executing the traffic management plan and modifying the plan as warranted by real-time conditions on the day-of-event. Team organization includes agency representatives stationed at a central command post, at secondary command posts, at a permanent TMC, and at strategic locations in the field for traffic control and observation. The traffic management team generally functions under a formal management process, namely the Incident Command System, to ensure successful traffic management plan deployment and minimal impact to transportation system users. Traffic monitoring provides traffic and incident management support in addi-

tion to performance evaluation data. Timely deployment of contingency plans developed during the event operations planning phase depends on the accurate collection and communication of real-time traffic data between traffic management team members.

Traffic Management Team

The traffic management team includes not only many of those stakeholders that have been involved during the event operations planning phase, but all those who may be involved for the first time on the day of the event. Table 3-37 lists typical stakeholders involved in day-of-event activities.

Table 3-37
Traffic Management Team Stakeholders

STAKEHOLDER
• Traffic operations agency
• Transit agency
• Law enforcement
• Public safety
• Event organizer
• Transportation consultants
• Traffic control contractors
• Emergency management agency

Stakeholder Roles and Coordination

A planned special event represents a source of non-recurring congestion where, similar to a traffic incident, stakeholders must adopt a formal management process to ensure successful traffic management plan deployment and minimal impact to transportation system users. The Incident Command System can be used to handle traffic management during planned special events. The ICS organizes and coordinates multi-agency response to an incident by establishing responsibilities and lines of authority. An Incident Commander has overall responsibility for managing the planned special event.

Command Post

The ICS will most likely be used in a multi-agency command post. The command post will probably be at or near the venue where the planned special event takes place. Depending upon the size of the event, secondary command posts may exist. These secondary command posts may take on specific areas of responsibility, such as law enforcement or traffic control.

In some instances, a permanent TMC may serve as the primary command post. The advantage of using the TMC is that many of the communications resources and other needed tools are already in place.

Advantages of a single command post include: (1) key agencies are represented in a single location and (2) communications among agencies are simplified.

An advantage of secondary command posts is that event management can be more easily switched if a problem develops at the primary command post.

Resource Planning

The plan developed for the resources needed for the event represent the collected best opinion on what is needed. Resource planning involves the following two parts: (1) determining the scope and amount of resources that will be used on the day-of-event and (2) identifying resources in advance in case the traffic management team needs more resources than planned to implement the traffic management plan.

The most important resource that stakeholders must plan for involve personnel resources. Planning considerations include:

- What type and quantity of skilled personnel are needed?
- Where should personnel be deployed?
- What responsibilities will individual personnel have?

Managing Traffic

While the traffic management plan and supporting implementation plan notes how stakeholders expect to manage traffic, the actual management of traffic on the day-of-event may differ from what the plan calls for. Traffic incidents, changing weather conditions, and other unexpected events can all cause the traffic management plan to be modestly modified or completely changed. After safety, successfully managing traffic represents the reason why stakeholders developed the traffic management plan in the first place and that goal must remain paramount.

As part of the traffic management plan, various scenarios can be addressed from best case to worst case, together with likely variations. Having different scenarios and response plans specified in the traffic management plan will help managers more quickly respond to changes. Again, not every variation can be noted, but experienced staff can modify what the traffic management plan calls for.

Evaluation Activities

Although many hours have been spent creating the traffic management plan, the plan should remain flexible with the ability to modify and enhance it with necessary changes based on real-time traffic conditions. Updates can continue through the course of the planned special event, accounting for new situations and unexpected events. Evaluation of the plan is an ongoing activity during the event, and participants should contribute their insights as they witness the event unfolding. The traffic management team must be open to modifications of what had been agreed to during the event operations planning and implementation activities phases.

Table 3-38 indicates key traffic management plan evaluation activities on the day-of-event.

Table 3-38
Traffic Management Plan Evaluation Activities

ACTION

• Establish briefing schedule and location (e.g., command post).
• Identify ranking representative of each stakeholder agency participating in briefings.
• Conduct day-of-event briefing.
  o Situation status
  o Objectives and priorities
  o Current organization
  o Personnel and equipment resource assignments
  o Communications
  o Concerns and related issues
  o Recommended changes
• Achieve consensus on recommended changes.

Communication

In most areas of the country, interoperable communications, in which all agencies are able to communicate on a common radio frequency, is not yet a reality. That being the case, it is necessary for a communication structure and protocol to be established. As shown in Table 3-39, the structure should include the noted primary considerations.

Whatever frequency is used, it is important that all those who must use it be able to access the channel and that coverage include all areas where operations will take place.

Table 3-39
Communications Structure Primary Considerations

CONSIDERATION
• What radio channels or frequencies will be used. • Who will use these channels. • Will a common lexicon be used for communications.

Another important part of the protocol involves using *common language* on a multi-agency frequency. An increasing number of agencies are now using clear language protocols on their radio frequencies, and these standards should be followed if multiple agencies have to communicate with one another. Clear language simply says that commonly understood words and phrases are used instead of codes.

Interagency Communication

To minimize confusion and extraneous information being shared among agencies, the question of who will use which frequencies should be decided during the planning process. Stakeholders should understand: (1) how they can reach other traffic management team members during the event, (2) which channels they will be found on, and (3) what information should be shared.

Since many of the stakeholders comprising the traffic management team may not be accustomed to interagency coordination, they should understand the importance of sharing information with their interagency partners. Information not shared with others who are affected could lead to difficulties managing traffic and cause mistrust among participating stakeholders.

Equipment

The participating agencies may normally operate on a wide variety of systems. VHF, UHF, and 800 MHz trunked systems are among those in common use, and agencies cannot normally communicate from one system to another. Before the right equipment can be identified, it is important for the stakeholders to understand what they want the communications system to do. Is it simply a means to share information, or does real-time coordination have to take place? Who has to operate on the channel? Where will they be located? Once these questions are answered, it becomes possible to identify the appropriate equipment to use for the event.

Interacting with the Media

The media may find that the usual means they use to get traffic information are unavailable during the planned special event. Due to security concerns, airspace near the site may be off limits. This makes the media more dependent upon the agencies to provide them with updates.

Unless a proactive decision is made otherwise, most agencies would not want the media to call the command post for updates. Calls to and from the TMC may be the best way to get information to the media. Wherever the media are directed to call, it is important that the person handling those calls has the most up-to-date, accurate information available. For the media to trust this source, they must believe that this is the best place to get information. Since most media want to verify information on their own, agencies should be prepared for the media to seek out other sources. The media may also acquire information via cell phones from event patrons driving to the planned special event, and the media will want to verify the information the public provides with the transportation agencies. If trust is lost be-

tween the media and the agencies, the agencies may lose control of the flow of information.

Traveler Information Dissemination

Traveler information will have two important audiences during the event: (1) those who plan to attend and (2) those who want to avoid the delays the event may cause. In both cases, traveler information tools can be used to effectively disseminate information.

On the day-of-event, it must be clear who will update traveler information devices and how timely and accurate information will get to the officials responsible for providing the updates. These individuals must be part of the communication chain. Assigning a dedicated person to handle the updates would be ideal. Conflicting priorities could result in out-of-date information being disseminated if one person is asked to handle too many tasks.

Traffic Monitoring

Agencies responsible for managing planned special events require numerous types of information on the current conditions of the system to support delivery of effective service for the planned special event. This required information varies widely depending on: (1) the service being provided, (2) how often it needs to be collected, and (3) how accurate it needs to be.

In a traffic management system, the traffic monitoring component, or surveillance component, is the process in which data is collected in the field. This data is used to supply information about conditions in the field to other system components including personnel located in the field on the day-of-event.

The information collected through the monitoring effort is valuable for post-event activities. After the event, the information gathered and/or observed can be used as part of the program or event evaluation. The data collected provides: (1) input into estimating the benefits of the traffic management plan and operation and (2) input into planning for future planned special events.

Performance Evaluation Data

Performance measures provide the basis for identifying the location and severity of problems (such as congestion and delay), and for evaluating the effectiveness of the implemented planned special event management strategies. In essence, performance measures are used to measure how the transportation system, and therefore the traffic management plan, performs with respect to the adopted goals and objectives, both for ongoing management and operations of the special event and the evaluation of future options.

In managing travel for planned special events, a direct relationship exists between the performance measures selected and the data needed in the performance measurement process. The data and information used in decision-making must be of high quality because the remedies have to be performed immediately. They must originate from reliable, consistent sources and meet the needs of the decision makers. Moreover, the decision makers must have confidence in the information, or it will not be used.

POST-EVENT ACTIVITIES

Post-event activities range from informal debriefings between agencies comprising the traffic management team to the development

of a detailed evaluation report. Qualitative evaluation techniques include individual debriefings of traffic management team members, patron surveys, and public surveys. Quantitative evaluation techniques include performing an operational cost analysis and analyzing performance evaluation data collected during the traffic monitoring process. Evaluation results, identifying needs and successes, represent valuable input toward planning for future planned special events and creates an iterative process.

Evaluation Framework

The first steps in the evaluation of the traffic management plan implemented for the planned special event take place during the event operations planning phase. Knowing ahead of time that a post-event evaluation will occur allows participants to make provisions for the review. In particular, this means collecting data during the event, which can be used as part of the review process. At a minimum, this would include data indicating how the system performed and a log of what took place during the event.

Measures of Effectiveness

Measures of effectiveness represent quantitative measures that give some insight into how effectively a unit is performing. MOEs are measures of activity that, while not reflecting performance directly, show workload and trends. To evaluate how well the traffic management plan worked, some form of measurement is necessary. In addition to telling stakeholders how effective their plan was, the measurements provide transportation professionals the means to demonstrate to others, including the media and elected officials, how well the plan may have worked.

There are two areas of effectiveness that should be measured, *internal* and *external*. Table 3-40 indicates examples of internal measures. Table 3-41 presents a list of external measures.

Table 3-40
Internal Measures of Effectiveness

MEASURE
• Number of messages displayed on changeable message signs
• Number of messages broadcast on highway advisory radio
• Number of traffic incidents handled
• Number of messages transmitted between stakeholders
• Number of traffic signal timing changes
• Number of times a ramp(s) was closed and time/duration of closure(s)

Table 3-41
External Measures of Effectiveness

MEASURE
• Volume of traffic on major routes
• Volume of traffic on alternate routes
• Volume of traffic entering and exiting the site and parking areas
• Hours of delay
• Number of event patrons and participants utilizing transit to and from the event
• Travel times
• Modal split
• Average vehicle occupancy

Application to Future Events

Whether the event is a one-time only happening or an annual occurrence, what has been learned through the evaluation can contribute toward proactively improving travel management for all planned special events occurring in a region.

To be beneficial for future planned special events, the results of the evaluation should be documented and made accessible. In the case of a one-time only event, the evaluation may show both general and specific insights, which can be used for other future planned

special events. These could include areas such as traveler information, interagency communications, and the planning process itself.

For recurring events, a file providing the cumulative benefit of lessons learned will help sharpen the traffic management plan developed for each new occurrence. It is also important to remember that with recurring events, slight changes in circumstances will require modifications to the plan.

Participant Evaluation

Participant evaluation includes: (1) stakeholder debriefing, (2) patron survey, and (3) public survey.

Stakeholder Debriefing

At the conclusion of the planned special event, a debriefing session should be held. The stakeholder debriefing is an opportunity to bring together those involved and impacted by the planned special event. In it, these individuals, and the groups they represent, can compare what the plan called for and what actually took place. They can also examine areas the plan may not have addressed but turned out to be issues in hindsight. All of those who were involved in creating the traffic management plan, as well as key people who played a role during the event itself, should be present for this session. This includes stakeholders forming the event planning team and traffic management team. Table 3-42 lists elements of a stakeholder debriefing.

Patron Survey

Although the goal is to keep traffic moving on all of the transportation facilities, the patrons are the ultimate customers of everyone involved in the traffic management of the planned special event. It is largely for their benefit the traffic management plan was created in the first place, and they are the ones likely to suffer the greatest consequences if the plan does not work. Therefore, the viewpoint of event patrons is needed if a credible evaluation of the plan is to be done.

Table 3-42
Elements of a Stakeholder Debriefing

ELEMENT
• Introductions of individuals and the roles they played (if not obvious)
• Explanation that the debriefing is not designed to find blame for anything which may have gone wrong, but to identify areas of improvement for future planned special events
• Distribution of a chronology of the special event, preferably one which melds individual agencies' own chronologies
• Review of the timeline of events
• Discussion of other areas of concern
• Next steps to incorporate lessons learned

Sample questions for possible inclusion in a patron survey include:

- Were you aware of any special travel information before the event?
- Did you find information provided enroute to the event (e.g., via signs, radio) helpful?
- Did you experience any unexpected problems approaching the venue?
- Do you have any suggestions or other comments you wish to offer?

Public Survey

The public survey takes in a wider audience than the patrons. This includes those who may have been impacted by the planned special event even though they did not attend the event. Since this is a larger and more diverse group of stakeholders, it may be more difficult to identify and survey them.

Sample questions for possible inclusion in public survey include:

- Were you aware of the event before it took place?
- If you were aware of the event beforehand, would you have altered your plans based on that information?
- Did you change your plans or schedule as a result of the event?
- How would you evaluate the effectiveness of traffic management efforts for this event (poor, good, excellent)?
- Do you have any additional comments or suggestions based on your experience?

Post-Event Debriefing

A post-event debriefing should be held to review what took place. The purpose of the debriefing is to: (1) examine what took place, (2) compare it to what was expected to happen, (3) identify what worked well, and (4) determine areas of improvement for future planned special events.

It is important to remember that the post-event debriefing is not designed to be a time to blame individuals or agencies for what took place during the event.

Table 3-43 lists the broad topic areas that should be covered in the post-event debriefing.

Table 3-43
Post-Event Debriefing Meeting Agenda Topics

TOPIC AREA
• Purpose of meeting
• The planning process
• Interagency communications
• Traffic management in and around the venue
• Traffic management outside of the event site
• Traveler information, including media
• Lessons learned

The purpose of the post-event debriefing is not to just identify what could have been done better but to note what was successful. The successes and lessons learned must be chronicled so that those stakeholders who are responsible for planning the next planned special event will be able to tap the wisdom of those who have done this before.

Post-Event Report

Table 3-44 presents an outline of a typical post-event report.

Table 3-44
Outline of Post-Event Report

REPORT ORGANIZATION
• Outline report topics. • Document products of the event operations planning phase. • Identify key successes. • Present lessons learned. • Identify improvements for future events. • Configure to serve as a working document for future special event planning. • Review chronologically what took place. • Summarize both positive and negative aspects. • Include all stakeholder viewpoints.
OPERATIONAL COST ANALYSIS

• Examine operational costs.
• Include staffing, overtime, and equipment for each involved agency.
• Identify potential cost savings.
  o Reallocation of personnel
  o Division of responsibilities
  o Use of technology
• Include total staffing, overtime, and equipment for all agencies.

QUALITATIVE EVALUATION
• Include survey of stakeholders. • Include survey of event patrons. • Include survey of public.
QUANTITATIVE EVALUATION

• Provide numerical picture of the event.
  o Costs
  o Hours saved
  o Traffic incidents handled
  o Passengers carried on various modes.
• Present cost/benefit analysis.

Since the process of handling the planned special event follows a timeline, the easiest way to organize the report may involve reviewing what took place chronologically. An alternative method of organizing the report concerns dividing it by subject areas such as traffic management, traveler information, command center operation, and communications.

The report should summarize both positive and negative aspects. Remember, this is not designed to be a public relations piece to promote the handling of the planned special event but a working document to assist future special event planning.

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CHAPTER FOUR
REGIONAL AND LOCAL COORDINATION

Figure 4-1
Closed-Circuit Television Camera on a Stadium Access Road

PURPOSE

This chapter covers the first of five phases of managing travel for planned special events. Program planning for planned special events involves activities unrelated to a specific event. This level of advance planning involves the participation and coordination of stakeholders having an oversight role in addition to agencies directly responsible for event operations planning. Products of program planning include establishing new institutional frameworks, policies, and legislation to monitor, regulate, and evaluate future planned special events. Stakeholders utilize program planning initiatives to more efficiently and effectively complete event operations planning, implementation activities, day-of-event activities, and post-event activities for individual, future planned special events. In turn, post-event activities (e.g., participant evaluation, stakeholder debriefing meeting, evaluation report) performed for specific special events provide valuable input for on-going program planning activities in a region or jurisdiction.

This chapter presents key elements of program planning on a *regional level* and *local level* that facilitate improved planning and management of travel for future planned special events affecting multiple jurisdic-

tions or a single municipality, respectively. It also describes strategic *infrastructure support* considerations for improved traffic management and dissemination of traveler information. The occurrence of major or recurring planned special events often serve as a platform for stakeholders to assess new services and infrastructure proposed for a single or series of special events in the context of supporting: (1) all special planned special events in a region and (2) day-to-day transportation system operations.

INTRODUCTION 

This chapter presents program planning activities conducted for future planned special events. These activities include the development, by oversight team stakeholders, of policies, programs, and regulations that collectively comprise a special event program for managing all planned special events in a region. Program planning for regional planned special events requires an institutional framework for generating and managing successful programs and initiatives. Some key topics and initiatives addressed in this section include:

- Role of oversight stakeholders, including (1) how their involvement is coordinated, (2) what are the programs and initiatives that facilitate the planning and operation of planned special events, and (3) how special events planning is integrated with other ongoing transportation programs.
- Support necessary from a policy perspective. On a policy level, interagency agreements permit those involved to work together. At times, legislation may be needed to allow agencies to go beyond their current activities into areas not currently permitted legally.
- Regional planned special events programs. In many instances, the impact of planned special events will extend beyond the jurisdiction of a single agency. In this section, the key elements of regional planned special events programs will be identified, the scope and benefits of such programs will be noted, and stakeholder organization will be explained. Also covered in this section is how such programs are developed, and just as important, sustained. Services and initiatives that go into regional planned special events management will be explained and the institutional issues, likely to be encountered, will be noted.
- Government agency permitting and regulation framework. The permitting process can identify many of the basic elements of the special event such as its timing, location and expected number of event patrons. Through a carefully constructed permitting process, transportation and public safety agencies can achieve a better sense of what resources these stakeholders need to handle the event. This section will provide an overview of the permit process, what the process includes, the components of a detailed application, and the associated requirements including recovery of public stakeholder expenses.
- Infrastructure support. Technology can be used for a variety of purposes, including communication among stakeholders and to the public in addition to transportation system management and monitoring during events. Paying for these activities is covered in the subsection on funding sources.

REGIONAL LEVEL 

Institutional Framework

Stakeholder Roles and Coordination

Program planning for regional planned special events concerns proactively improving travel management for all planned special events in a region. This necessitates the involvement and coordination of stakeholders representing multiple jurisdictions. At the program planning level, the stakeholders include:

- Those agencies directly involved in planning and day-of-event travel management for special events. These include law enforcement agencies, transportation departments, transit providers, and regional organizations.
- Others who typically are not involved in transportation management, such as the event organizers and elected officials serving an oversight role.
- Typically, mid-to-upper level agency administrators that collectively form the planned special events oversight team.

The FHWA publication, *Regional Transportation Operations Collaboration and Coordination*, addresses how regional coordination can take place during incidents and emergencies.[1] While unplanned events are not specifically targeted in the publication, the same basic elements can be applied to planned special events. Figure 4-2 indicates five major elements of a framework for regional collaboration and coordination. The balance of this section notes how each of the elements fits into regional coordination for planned special events. The five-step process described below is not instituted when an incident or emergency takes place, but is a way of doing business that facilitates regional coordination when an event occurs.

Step One: Identify the Stakeholders. Which agencies and organizations will have a role in managing events? Which agencies have an oversight role? Depending on the location, there may be multiple states or several metropolitan planning organizations (MPOs) that have an oversight role.

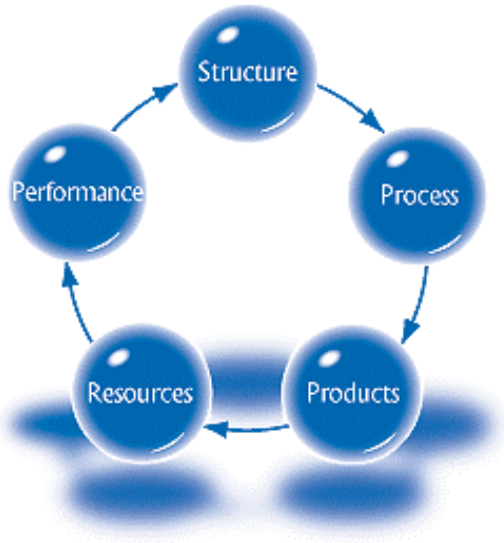

Figure 4-2
Major Elements of a Framework for
Regional Collaboration and Coordination[1]

As these questions are answered, a widening circle of stakeholders will be identified. As they are listed, their roles and responsibilities will be noted. Since not all stakeholders will have the same level of participation, their involvement in the planning process can also be assessed.

Step Two: Identify a Lead Agency. While a collaborative process is ideal in dealing with a planned special event, there is still a need to identify a lead agency that will have overall responsibility for the group's work. In many instances, no one agency will have a clear leadership role for program planning. A possible way to pick a leader without offending other lead agencies is to use co-chairs representing different disciplines or geographic areas. Leadership can also rotate to assure that all key players have an opportunity for a leadership role.

While the lead agency oversees the entire process, it can delegate elements of the plan

to others with expertise in particular areas. For example, public safety issues might be assigned to a law enforcement agency or a sub-committee of public safety agencies. These stakeholders would help make up the *structure* in which regional coordination takes place.

Step Three: Maintain Communication. Throughout the planning process, communication among stakeholders is critical. Meetings of the stakeholders represent a venue where stakeholders can share what they see as their role in the planning process. As they meet, roles and responsibilities are adjusted as agencies understand what other agencies will be doing and how they can assist each other.

Step Four: Form Subcommittees. Depending upon the complexity of the event, subcommittees may be formed to focus on specific planning elements. For example, security may only directly involve law enforcement agencies at the local, state and federal levels. These agencies can meet separately to plan their segment of the overall plan. Representatives of these subcommittees can share their progress, along with their needs, with other stakeholders at higher level planning meetings.

Step Five: Continue Communication. Throughout the planning process, the lead agency takes a *big picture* view and serves as a coordinator. Its responsibility is to see that communication and coordination are taking place among the stakeholders and, if necessary, to facilitate that coordination where it is not taking place.

Programs and Initiatives

While planned special events may be temporary, and the planning for those events may bring together a group of stakeholders only for that event, ongoing programs and initiatives can be used to address general special event needs on a continual basis. This portion can be described as the *processes* of coordination. Processes are what the stakeholders have agreed to that will provide the basis for how they will work together. An institutional framework can be created either before an event takes place or based on the planning for a specific special event. This framework can be used on a continuing basis to allow easier coordination among agencies for future events and eliminates the need to re-establish working relationships, which have already been created.

A state transportation agency or an MPO can develop a program that identifies what is needed for the effective management of special events. These overarching needs may include funding mechanisms, means of early identification of special events needing regional planning, and a template to bring stakeholders together to begin the planning process.

Funding is an important consideration since it is needed to pay for the time of staff assigned to planning and coordination efforts. Without an identified source of funding, the participation of agencies is subject to the availability of financing from the home agencies of those asked to take a role. At times of budgetary restrictions, agencies may not choose to make staff members available for planning and coordination, or they may limit the time or number of staff members who are needed to formulate a plan. This could be especially true for agencies that are outside of the jurisdiction where the event is being held. However, funding could be included within the budget of an MPO or a state DOT.

While all stakeholders may be aware of recurring special events, such as sporting

events and annual fairs, or major events such as the Olympic Games or the Super Bowl, less prominent events may not gain notice until just before the event. Having a program in place to identify special events requiring planning well in advance is beneficial. This initiative could take several forms. One example is regularly scheduled meetings where upcoming events are noted and discussed among regional agencies. Identification of potential problems would alert all involved to the event and allow agencies to decide if multi-agency planning needs to take place. Such meetings could be held specifically for this purpose, or they could be incorporated as part of gatherings held for other purposes.

The process of regional coordination and collaboration leads to the *products* of coordination. These products include a regional concept of operations, baseline performance data, current performance information, and operating plans and procedures that inform regional entities (public and private sector) about how the regional transportation system must operate over time (including planned improvements).

Integration with Other Transportation Programs

Planned special events are just one example of transportation activities requiring multi-agency coordination. Special events planning could be held in conjunction with other multi-agency efforts such as construction coordination, incident management planning, and wireless communications coordination. These activities bring together most, if not all, of the key regional transportation and public safety agencies and, in turn, allow them to discuss special events while they are already together. By expanding the agenda of such meetings to include initial special events planning, agencies are given one more reason to attend. Also, meeting fatigue is limited by not having stakeholders attend separate meetings focused only on special events.

For some smaller special events, these regularly scheduled meetings may be sufficient to alert affected stakeholders and to do a minimal amount of planning. For larger special events, requiring more detailed preparation and coordination, separate meetings should be considered. This will allow specialists to participate where necessary and will allow the original meeting to not lose its focus on a wider agenda. The regularly scheduled meetings can also be a place where updates of the more detailed plan are presented.

Policy Support

Interagency Agreements

In most instances, transportation and law enforcement agencies have no prohibitions from coordinating efforts with other agencies, especially for events expected to have an impact on that agency. However, there are instances where interagency agreements are helpful, or even necessary, for multi-agency cooperation.

While interagency agreements will vary based on state law and the culture of the agencies, there are some common issues they can address.

One issue would be *areas of responsibility*. State police, state DOT and toll agencies could each be given broad areas of responsibility through an interagency agreement. By spelling out these responsibilities ahead of time, *turf issues* can be minimized and the same ground does not have to be covered each time the agencies gather to plan a special event.

Funding issues can also be addressed in interagency agreements. If it is known ahead of time who will be paying for various aspects of the effort, confusion will be reduced and participation encouraged. In some instances, the agreements could specify that a non-public agency, such as the event organizer, is responsible for paying for certain parts of the planning and coordination effort.

Legislation

Legislation provides the legal authority for a government agency to take certain actions. In many instances, activities involved in special events planning have already been addressed by legislation. Examples include law enforcement responsibilities for the state patrol on an interstate highway leading to the event venue or the state department of transportation being responsible for operation of a transportation management center (TMC) in the area of the event. However, there may be special circumstances not addressed in current legislation.

Examples where special legislation may be needed could include permitting agencies to operate outside their current jurisdiction or taking on activities they have not been given specific authority to undertake.

Some important considerations in establishing legislation during the program planning phase include:

- Since creating and passing legislation is normally a lengthy process, it is important that these needs are identified early so the process can be completed before the new law is needed.
- In many instances, a request for legislation has to go through many steps within an agency before it is even presented to lawmakers. At a minimum, agency counsel and executive management needs to be involved. Since these individuals typically would not be involved in special events planning where these needs are first identified, it is also important that procedures be in place to begin the legislative process.
- Most agencies already have procedures in place to bring legislative needs to the attention of lawmakers, but it is important that those who first identify these needs know what those procedures are and how to get the process started.

Regional Planned Special Events Program

Key Elements

A regional planned special events program is an ongoing process designed to address a region's needs for managing special events. It is not a program put in place to address a specific special event, although a specific event may trigger the formation of such a program.

The program involves those agencies that have a role in managing planned special events as well as those agencies that may be in an oversight or funding role.

The program will put in place the framework for handling regional planned special events including:

- A template for groups created to deal with specific special events.
- Identification of funding to support such planning.
- Identification of infrastructure improvement needs in the region to better manage special events.

All of these elements used to implement a regional special events program can be con-

sidered the *resources*. These resources will vary depending on what is available in the region and to the participants.

Scope and Benefits

The scope of such a program should focus on planned special events of regional significance. If an event can be wholly managed within and by a single agency or jurisdiction (e.g., through a planned special event permit program), then there is no need for the regional plan to come into effect.

However, those events that reach beyond a single agency or jurisdiction would be addressed by this program. Regional events may vary in size. For example, a parade through two towns would have limited regional impact and might require only minimal coordination, but a mega-event, such as the Olympics, would involve multiple regions and a large number of agencies.

Key benefits of a regional planned special event program include:

- The primary benefit to the creation and maintenance of such a program is that it establishes a mechanism for agencies to work together before they are *forced* to work together as the result of an impending event.
- By early identification of funding opportunities, agencies can address monetary needs prior to the event. Therefore, when an event is proposed, stakeholders can focus on planning and not be concerned with funding the planning.
- Another benefit is that by early identification of infrastructure improvements, there is a higher likelihood that the improvements can be put in place before they are needed. Noting what improvements are needed just before the event may mean they will not be available given the lead time needed to make the improvements.
- Legislative and policy needs will also be identified through this program. As with infrastructure improvements, this will allow these needs to be addressed prior to their being required.
- An intangible benefit accruing from a regional planned special events program is the development of relationships that will extend to other operational areas.
- Better communication and cooperation is likely and will help in areas such as incident management and construction coordination.

It is important that performance measures be planned: (1) to note the *performance* benefits of the regional planned special events program and (2) to demonstrate the differences it has made to mobility and coordination within the region. Since the goals and objectives of the program are part of a collaborative process, what is measured should also be agreed to by the participants.

Stakeholder Organization

The stakeholders in a regional program such as this will vary from region to region. Table 4-1 lists organizations that should be considered part of the program. Leadership of the program will vary by region, but the agencies most likely to take the lead include state DOTs, state law enforcement agencies, and MPOs.

Program Development and Sustainment

Perhaps the hardest step in the development of the program is the first step, *creation of the program*. A champion of the idea, who is willing to go through the difficulties in establishing the program, is very helpful. This person can reach out to those people in leadership positions who will support the

program and assign people within their organization to work on its creation. The champion will also shepherd the program through the red tape, agency mazes, and obstacles any significant new idea is sure to face.

Table 4-1
Regional Program Stakeholder Organizations

STAKEHOLDER ORGANIZATIONS
• State Department of Transportation
• Metropolitan Planning Organization
• State police/patrol
• Toll agencies
• Mass transit agencies
• Municipal governments and police departments
• County governments and police departments
• Owners of large venues (e.g., arenas, stadiums, universities)

Ideally, agencies should assign people within their organization who support the concept and who can speak on behalf of their agency when decisions need to be made. These people should have a strong commitment to the program and be willing to attend meetings and take follow-up actions identified at these meetings.

Potential funding agencies should be a part of the program from the start. They can provide guidance on where funding is available and the steps that need to be taken to obtain it. By being involved at the beginning, the representative from the funding agency can guide the group in what they must do and help avoid situations where early decisions have to be adjusted to meet needs that are later identified.

The sustainment of the program will be due, in part, to the support of those who participate. Open lines of communication should keep all stakeholders and interested observers informed of what is being done as well as problems that may be encountered. What is needed is not someone who only sees the good, but someone who can make a realistic assessment of where the challenges lie and how to overcome them.

While what is described in this section involves varying levels of involvement, a region just starting to initiate program planning for regional planned special events should not be intimidated by what may be required before they take their first steps. As a starting point, even before high-level support is obtained or funding is identified, first steps can be taken on an informal basis among operations level staff to share information and to use resources which are already available, such as highway advisory radio (HAR), changeable message signs (CMSs), and interagency communications channels. Often it is these first, informal steps that demonstrate the value of regional coordination and lead to more formal support.

Services and Initiatives

The customers for this group are the event planning team and traffic management team charged with making planned special events run smoothly from a transportation perspective. The services they provide should be designed to make special event operations run well. While the regional planned special events program stakeholder group will identify early action steps and other needs, it is important that they seek the input of operations personnel as they define the services they will provide.

The very creation of the group provides an important service: (1) a forum for information to be shared and (2) needs to be identified. Other services the program will provide are those noted earlier:

- Identification of funding sources.
- Funding of the program itself.
- Identification of needed infrastructure improvements.

By handling these issues, the program will allow operations staff to focus on specific plans and leave some of these other concerns to the group.

Institutional Issues

A regional planned special events program will face some of the same institutional issues faced by other multi-agency programs. To assure the success of the program, the following two institutional issues should be handled at the start of the process:

- Control and leadership issues.
- Need for buy-in from participating agencies.

The program needs to be flexible enough to deal with changing conditions. The structure established may not always be the ideal one for every event. Agencies should be comfortable dealing with the ambiguity that comes with new situations and be able to adjust to the situation presented.

The flexibility also affects budgeting. While expenditures need to be allocated, a reallocation will likely be needed at times to address new concerns and needs.

While a core group will participate in running the program, it may be necessary from time to time to bring in new organizations. The program should anticipate expansion so that it does not become an issue and can easily be integrated. While institutional issues among participating agencies may be a problem at the start, there exists danger of the program itself becoming an institution and presenting its own set of issues.

Many institutional issues can best be handled by those who participate in the regional planned special events program. The relationships established by committee members can be extremely helpful in overcoming encountered problems. As personal relationships develop among the members, institutional barriers become less significant and easier to deal with.

A regional committee on planned special events should not see their task as a one-time effort. Even without a specific event on the horizon, the group should work to maintain the relationships developed and adjust the planning process so that it remains fresh. This could be encouraged through regular meetings in which the group looks at upcoming special events that might require regional coordination or by expanding the role of the group so they can address other transportation management issues in-between special events. This could include areas such as roadway construction coordination and incident management planning. Some regions have even used groups such as this to provide better regional coordination for non-events such as road weather management or recreational traffic management (e.g., reach the beach, etc.).

While many of the issues addressed in this section look at planning for special events on both a short-term and medium-term basis, agencies also should consider long-term planning (10-20 years) on how they wish to handle special events. This long-term planning can address areas such as: (1) major infrastructure improvements, (2) creation of new organizations that may be needed, or (3) long-term financial and legislative needs to address these improvements. While operations level people can help identify these needs, the development of long-term plans also will require the involvement of planners and executive staff, along with legislators

and their staffs. An MPO can also be expected to play a major role in meeting these long-term needs since they will approve Federal funding and will be able to view these needs in the context of all transportation needs for the region.

Relationship to FHWA Traffic Incident Management Self-Assessment Guide

The FHWA maintains a Traffic Incident Management (TIM) Self-Assessment Guide intended for use by state and regional TIM program managers to assess their achievement of a successful multi-agency program to manage traffic incidents effectively and safely.[2] Managers may also utilize the tool to evaluate gaps and needs in existing multi-agency regional and statewide efforts to mitigate congestion and safety impacts caused by traffic incidents. The TIM Self-Assessment tool consists of a series of questions designed to allow those with traffic incident management responsibilities to rate their performance, by assigning a score ranging from 0 (no progress) to 4 (outstanding efforts), in specific organizational and procedural categories.

Planned special events often represent a major element of a traffic incident management or freeway management and operations program. Such programs may spawn a committee on planned special events for the purpose of managing all planned special events in the program's region. The TIM Self-Assessment tool contains a TIM administrative team assessment question on planned special events. Question 4.1.2.5 states: Does the assessed TIM program conduct planning for "special events" including sporting events/concerts/conventions, etc.? This tool also includes several assessment questions applicable to measuring a program's progress regarding the advance planning and management of travel for planned special events.

Table 4-2 lists pertinent assessment questions categorized by the five defined phases of managing travel for planned special events. This technical reference provides guidance on the topics identified in the assessment questions from the perspective of planned special event planning, operations, and evaluation.

LOCAL LEVEL 

Overview of Planned Special Event Permitting

The development of a formal planned special event permit program marks a key program planning initiative to facilitate stakeholder coordination, compliance with community needs and requirements, and efficient event operations planning. Backed by guidelines and regulations specified in municipal ordinances, the program outlines a defined planning framework and schedule for event organizers and participating review agencies to follow. It represents an *agreement* between participating public agencies (e.g., transportation, law enforcement, public safety, etc.) to ensure, through planning activities or review, that all planned special events meet a set of mutually agreed upon requirements for day-of-event travel management. A municipal permit represents approval, or agreement between a jurisdiction and event organizer, to operate a planned special event, and it includes provisions outside of travel management. Larimer County, WY defines the purpose of a planned special event permit as follows:

Table 4-2
Traffic Incident Management Program Assessment Questions Relative to Managing Planned Special Events

PHASE	ASSESSMENT QUESTION
Program Planning	Does your program: • Have formal interagency agreements on operational and administrative procedures and policies? • Have multi-agency, multi-year strategic plans detailing specific programmatic activities to be accomplished with appropriate budget and personnel needs identified? • Have field-level input into the strategic plans ensuring that the plans will be workable by those responsible for their implementation? • Have formalized multi-agency teams to meet and discuss administrative policy issues? • Hold regular meetings of the administrative team? • Have multi-agency agreements on what measures will be tracked and used to measure program performance? • Have established criteria for what is a "major event" – event levels or codes?
Event Operations Planning	Does your program: • Have agreed upon methods to collect and analyze/track performance measures? • Have established targets for performance? • Have a pre-identified (approved) contact list of resources? • Have response equipment pre-staged for timely response? • Utilize traffic control procedures in compliance with the MUTCD? • Have mutually understood equipment staging procedures? • Have quick clearance policies? • Have a pre-qualified list of available and contracted towing and recovery operators? • Use motorist assistance patrols? • Have specific policies and procedures for traffic management during the event?
Implementation Activities	Does your program: • Conduct training through simulation or "in-field" exercises? • Train all responders in traffic control procedures?
Day-of-Event Activities	Does your program: • Utilize traffic control procedures for the end of the traffic queue? • Utilize the Incident Command System? • Have a two-way interagency voice communications system allowing for direct communications between responders? • Use Traffic Management Center(s)? • Have the ability to merge/integrate and interpret information from multiple sources? • Have a real-time motorist information system providing event-specific information?
Post-Event Activities	Does your program: • Conduct post-incident debriefings? • Conduct periodic review of whether or not progress is being made to achieve performance targets?

The purpose of the special event permit is to insure that any changes, restrictions, or adaptations, resulting from such an event are managed in a safe, prudent, and legal manner in order to protect the health, safety, welfare, and convenience of the traveling public and citizens of Larimer County.

Special event permits apply to a single jurisdiction, and numerous cities and counties, encompassing metropolitan, urban, and/or

rural areas, across the Nation maintain a special event permit program. In contrast, a state DOT permit targets the satisfactory maintenance and protection of traffic on state highways necessitating partial or full closure due to a proposed street use event. In most cases, state DOTs encourage event organizers to use county roads or local streets whenever possible.

Some important considerations and applications of planned special event permitting include:

- Permitting proves particularly effective for less frequent continuous events, street use events, and rural events occurring at a temporary venue not having a known spectator capacity. These events place an emphasis on advance planning and public outreach to mitigate traffic operations deficiencies and community impacts.
- Jurisdictions may not require a permit for special events held at permanent venues, such as stadiums, arenas, and amphitheaters.
- Permitting allows jurisdictions the opportunity to engage the event organizer at the beginning of the event operations phase.
- Public stakeholders can size-up the event operations characteristics of a proposed event in order to schedule adequate personnel and equipment resources to accommodate the event. Resources may include traffic control, security, and maintenance.
- From the event organizer's perspective, a special event permit application and associated regulations outlines a general approach toward successfully managing travel for the event, facilitates coordination with appropriate stakeholders, and gauges resource requirements on the day-of-event.

The balance of this section on permitting will describe special event application components, review processes, guidelines, and regulations specific to managing travel for a planned special event. The section will include numerous references to special event permitting in city and county jurisdictions.

Permit Process

Initiation of the permit process for a specific planned special event begins with the submission of a completed special event permit application by the event organizer. The permit application represents a formal proposal by the organizer to stage a planned special event. In some cases, particularly those where the event organizer requests assistance from the jurisdiction in locating a suitable venue location or street use event route, the event organizer and pertinent public stakeholders may interact prior to application submission to review the proposed event and permit process.

Table 4-3 lists public stakeholders that may administer special event permit applications and issue permits. In small and medium-sized locales, law enforcement, transportation department, or city/town manager's office commonly processes a special event application for review internally and by other agencies in the jurisdiction. Some metropolitan jurisdictions have an office of special events that serves in a similar capacity. A local district partnership may assume a lead role in the permit process for events proposed in commercial areas. Jurisdictions issue an event permit based either on:

- A single official, such as a police chief, fire chief, director of public works, or elected official, rendering a final decision based on reviewer(s) input.
- A multi-agency application approval where each agency signs off on the

permit when the event organizer meets specific agency prerequisites.

Table 4-3
Stakeholders Governing Permit Applications

APPLICATION ADMINISTRATION
• Local law enforcement
• Local transportation department
• Fire department
• City/town manager's office
• City/town clerk
• Community development department
• Office of special events
• Local district partnership
• Public works department
• Parks and recreation department
• Bureau of licenses
• Office of finance
• Risk management office
PERMIT APPROVAL
• Police chief
• Fire chief
• Transportation department director
• Director of public works
• Multi-agency approval (e.g., public works, law enforcement, and city manager).
• City manager
• Community development director
• Street and sidewalk use coordinator of the bureau of licenses
• Local district partnership
• City/town council
• County board of commissioners
• Local planning commission

Figure 4-3 presents a flowchart summarizing key event organizer and public agency actions throughout the special event permit process, from submitting a permit application to conducting the proposed event. Agencies administering a permit application may assign a staff person, representing the jurisdiction's event coordinator, who will assist the event organizer throughout the permit process. Table 4-4 indicates permit application submission deadlines for several cities and counties. Application deadlines significantly influence the scope of activities performed during the permit process. To effect a comprehensive permit application review, including stakeholder meetings and public outreach, jurisdictions should mandate permit application deadlines at least 60 days prior to a large-scale planned special event. A shorter deadline is warranted when jurisdictions, for example Wichita, KS (30 day deadline), require event organizers to arrange all details with individual involved agencies prior to submitting a permit application for approval.

The special event permit process serves to scope, schedule, and direct event operations planning activities for proposed events. This reduces unnecessary delay in facilitating stakeholder coordination, developing planning deliverables (e.g., traffic management plan, etc.), reviewing mitigation strategies, and mobilizing personnel and equipment resources required to stage a particular planned special event. Practitioners may expand and contract the process in order to best fit: (1) the area type and involved stakeholders, (2) the special guidelines and regulations unique to a particular jurisdiction, (3) the operations characteristics of a particular event, and (4) the purpose of a particular event, such as community events versus commercial, for-profit events involving event organizers from the private sector. Chapter 2 of this handbook, under a section on "Impact Level," summarizes example decision criteria and thresholds used to determine the need to initiate a special event permit process in addition to event permit requirements.

As indicated in Figure 4-3, jurisdictions should conduct a preliminary review of the proposed special event date and time in addition to, if a street use event, the proposed parade or race route. Table 4-5 shows select jurisdiction regulations prohibiting the issuance of a permit for a special event occurring at a certain time and/or location. Aside

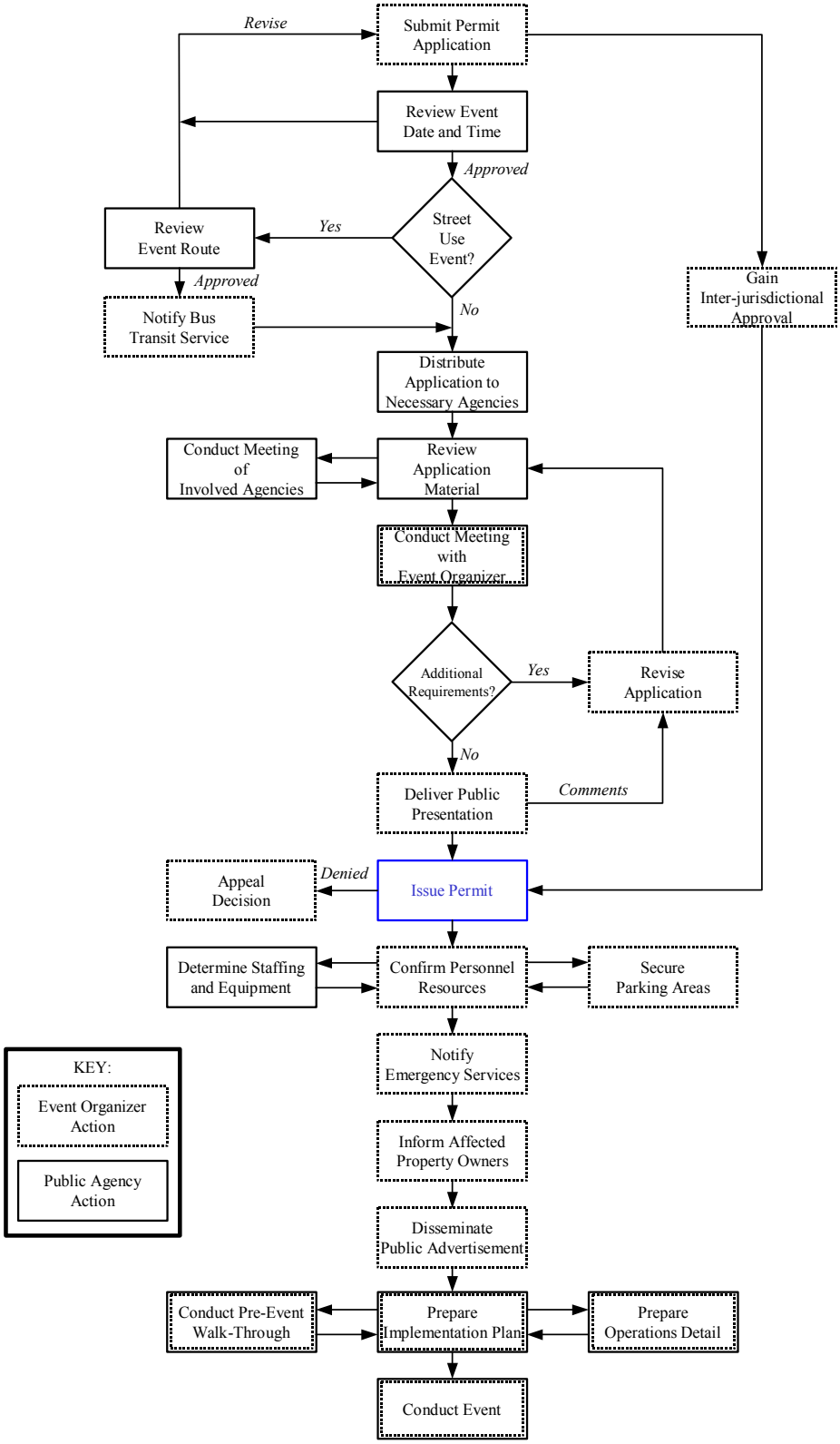

Figure 4-3
Planned Special Event Permit Process

Table 4-4
Planned Special Event Permit Application Submission Deadline

LOCATION	SUBMISSION DEADLINE PRIOR TO EVENT
Minneapolis, MN	5 days for parade; 60 days for race
Las Vegas, NV	14 days
Stamford, CT	14 days
Fort Collins, CO	20 days minimum; 1 year maximum
Jackson, CA	20 days
Clarksville, TN	30 days
Coos Bay, OR	30 days
Hot Springs, AR	30 days
Lancaster, PA	30 days
West Des Moines, IA	30 days
Wichita, KS	30 days
City and County of Honolulu, HI	40 days minimum; 9 months maximum
Bowling Green, KY	45 days
Reno, NV	45 days minimum; 1 year maximum
Larimer County, WY	40 days; 50 days for road closure
Louisville, KY	60 days
City and County of Denver, CO	60 days
Kane County, IL	60 days
Menlo Park, CA	60 days
Miami Beach, FL	60 days
Milwaukee, WI	60 days
Ypsilanti, MI	60 days
Montgomery County, MD	2 months
Virginia Beach, VA	60-90 days
Redmond, WA	90 days
Evanston, IL	90 days
Aurora, IL	120 days

from regulations designed to avoid conflicts with commuter traffic, the possibility of staging multiple events concurrently may cause significant travel impacts and logistics problems. Law enforcement, traffic engineering, and fire department agencies may conduct a preliminary review of a proposed event route and grant approval contingent on required traffic control measures. This step should occur prior to distributing a street use event application to all necessary agencies with preliminary approval rendered at least 30 days prior to the event. To expedite this step, San Luis Obispo, CA, for example, maintains two standard parade routes.

The special event permit application review phase involves all agencies within a jurisdiction having authority on an entity impacted by the proposed event, and certain agencies may require event organizers to meet prerequisites and/or obtain supplemental permits. Transportation approvals include street occupancy permits, parking variances, and requests for traffic control services.

Some key stakeholder considerations during the permit application review phase include:

- Involved agencies may conduct a meeting to coordinate their review and event planning considerations.
- For large-scale events, jurisdictions and associated review agencies may meet with the event organizer to discuss additional requirements and contingencies.
- Agencies should complete review of a special event permit application within about two weeks of receipt to allow the event organizer sufficient time to revise the application (e.g., site plan, parking plan, traffic control plan, etc.).
- To ensure full mitigation of potential local traffic and community impacts, jurisdictions, such as Miami Beach, FL and San Diego, CA (see Appendix A) for example, may require event organizers to present the proposed special event management plan to neighborhood and business associations and the general public for review and recommendation.
- The event organizer should deliver the public presentation early in the permit process, at least 30 days prior to the

Table 4-5
Planned Special Event Permit Restrictions

LOCATION	EVENT CATEGORY	RESTRICTION
City and County of Honolulu, HI	Street use event	• No parade or activity permitted between the hours of 5:30 a.m. to 8:30 a.m. and 3:30 p.m. and 6:00 p.m., Monday through Friday, except holidays. • In the Central Business District, a parade or activity permitted only on weekends and holidays or after 6:00 p.m. on weekdays. • No parade or activity permitted to use or travel the entire distance on Hotel Street, from Richards Street to North King Street. • Only one parade or activity permitted on any given day on any street.
Louisville, KY	All events	• Permit holders shall open the event venue to patrons at least one hour prior to the event.
Miami Beach, FL	All events	• No special event permitted if it interferes with a previously scheduled activity or repair work scheduled for a site. • No event permitted if it interferes with any other scheduled event. The City Manager may take into account simultaneously occurring events in the region or other factors that would impact the city's capability to host an event before approving an event. • No permit issued for more than four consecutive days or five non-consecutive days during the course of a calendar year.
Minneapolis, MN	Street use event	• No permit granted for a parade/race to be conducted within the downtown area between the hours of 7:00 a.m. and 9:00 a.m. or 4:00 p.m. and 6:00 p.m. on any day which is not Saturday, Sunday, or a legal holiday. • No permit granted for bicycle racing, foot racing, race walking, wheelchair racing, rollerblading, marathons, and jogging events unless the activity is to take place between the hours of 6:00 a.m. and 3:00 p.m. on Saturday, Sunday, or legal holiday.

event, so public comments can be incorporated into application revisions.

Jurisdictions typically issue a special event permit approximately 7 to 15 days prior to the event. The lead time allows the event organizer and other stakeholders to carry out necessary tasks under the implementation activities phase. These tasks include determining resource requirements and preparing an operations plan. Certain jurisdictions may handle, by regulation, day-of-event traffic control, while other jurisdictions designate partial or all responsibility to the event organizer. Stakeholders representing the event traffic management team should consider conducting a pre-event walk-through, done a few days before the event to permit modifications, to review the final site plan and traffic management plan.

Table 4-6 provides a snapshot of select jurisdictions and criteria referenced by officials when rendering a final decision on a special event permit application. Due to the changing dynamics of planned special event operations, jurisdictions, particularly in metropolitan areas, may issue a special event permit only days in advance of the event date.

Table 4-7 presents a list of common event organizer tasks performed during the special event permit process coupled with example deadlines. A common prerequisite to obtaining a local jurisdiction event permit involves the event organizer securing permits from all jurisdictions controlling roadways slated for temporary full/partial closure. This represents a program planning initiative for managing all planned special events in a

Table 4-6
Planned Special Event Permit Application Decision Criteria

LOCATION	EVENT CATEGORY	APPROVAL CRITERIA
Anaheim, CA	Street use event	• Time of the proposed parade. • Place of the proposed parade. • Manner in which the proposed parade is to be held. • Other proper uses of the streets such as construction/maintenance or pedestrian traffic; construction/maintenance on the streets involved in the proposed parade route.
Menlo Park, CA	All special events	• Day(s) of the week; time of day; number of days. • Venue distance from nearest legal residential use. • Number of people involved. • History of complaints.
Minneapolis, MN	Street use event	• Conduct of the parade/race does not substantially interrupt the safe and orderly movement of other traffic contiguous to its route or will interfere with street maintenance or other legally permitted events. • Concentration of persons, animals, and vehicles at assembly points of the parade/race will not unduly interfere with proper fire and police protection of, or ambulance service to, areas contiguous to such assembly areas. • Conduct of such parade/race will not interfere with the movement of firefighting equipment en-route to a fire. • Parade/race is scheduled to move from its point of origin and to its point of termination expeditiously and without unreasonable delays en-route.
Redmond, WA	All special events	• Event does not disrupt traffic beyond a practical solution. • Event does not interfere with access to fire stations and fire hydrants. • Event does not cause undue hardship to surrounding businesses and residents. • Event does not require the diversion of so many public employees that service is denied to other local residents.
Reno, NV	All special events	• Event will not conflict with established on-going events. • Event will not create a substantial interruption of public transportation or other traffic; conflict with development in the right-of-way; close major streets during peak commuter hours. • Event will not cause a diversion of such a great number of police employees that police protection of the remainder of the city is in jeopardy. • Event will not create undue interference with emergency vehicles. • Availability of sufficient traffic controllers, crowd monitors, safety equipment, or insurance coverage.
West Des Moines, IA	All special events	• Route of the event. • Date and time of event. • Maximum length of the event • Impact on residential and commercial neighbors. • Limitations on public use of area requested for event. • Number of events previously scheduled in the city on the same date. • Amount of city personnel necessary to regulate and monitor the event. • Interference with peak transportation periods, movement of the transit vehicles, movement of authorized emergency vehicles, and schedules of various construction projects. • Participant provisions including parking and dispersal routes.

Table 4-7
Event Organizer Special Requirements

TASK	DEADLINE	SPECIFICATIONS
Gain inter-jurisdictional approval	• 30 days before event.[1]	• Secure appropriate approval if temporarily closing roadways under the control of another jurisdiction.
Notify transit service	• 1 month before event.[2]	• Communicate street closure specifics for bus re-routing.
Deliver public presentation	• 30 days before event.[1]	• Present special event management plan to appropriate neighborhood associations or local planning board for review and recommendation.
Confirm personnel resources	• 21 days before event.[3]	• Obtain written confirmation from stakeholders that sufficient traffic management team personnel resources will be available on the day-of-event. • Use private staff to patrol private parking lots (not responsibility of on-duty law enforcement officers). • Off-duty law enforcement officers must be hired to provide VIP/dignitary escorts and to staff traffic control posts.
Secure parking areas	--	• Obtain written confirmation to use private parking lots (schools, churches, businesses).
Notify emergency services	• 14 days before event.[3]	• Inform fire departments and emergency medical service of the exact location, date, and time of planned road closures.
Inform affected property owners	• 30 days before event.[4] • 14 days before event.[5] • 10 days before event (14 days for review).[3] • Minimum 2 days before event and 7 days maximum.[6]	• Distribute an approved road closure notice to all property owners adjacent to a planned road closure. • Notify property owners, residents, and businesses within 300 feet of the event venue. • Distribute parking passes and/or escort passes issued by governing jurisdiction.
Disseminate public advertisement	• 15 days before event.[2] • 7 days before event.[3] • 2 days before event.[7]	• Publicize the special event through the media, including newspapers, radio and/or television stations. • Identify the event date and time, contact information, any traffic and parking restrictions, and a map of the street use event route. • Require review of announcement by public stakeholders.
Prepare implementation plan	• 7 days before event.[3]	• Summarize traffic management plan specifics. • Require plan for review by public stakeholders.
Prepare operations detail	• Complete before event.	• Indicate traffic management team personnel assignments and day-of-event operations activities. • Specify radio or cellular interface between agencies comprising the traffic management team.
Hire on-site coordinator	--	• Hire a public employee as an overall on-site coordinator, having decision-making authority, whose responsibility will be to ensure that all services are provided, the event runs smoothly, and all governing regulations and ordinances are complied with.
Day-of-event activities	--	• Install temporary signs and traffic control devices. • Maintain an approved copy of the permit application during the entire special event.
Post-event activities	• 2 hours after event close.[8] • 30 days after event for report.[9]	• Remove temporary signs and traffic control devices. • File post-event report. • Participate in post-event debriefing with public agencies, affected citizens, and other involved stakeholders to address issues that arose during the event.

Notes: [1] Miami Beach, FL mandate. [2] Louisville, KY mandate.
[3] Larimer County, WY mandate. [4] San Luis Obispo, CA mandate
[5] Reno, NV and San Diego, CA mandate. [6] Minneapolis, MN mandate.
[7] Pitken County, CO mandate. [8] Larimer County, WY and Kane County, IL mandate.
[9] U.S. Bureau of Land Management mandate.

region. Appendix A contains Washington State DOT guidelines for street use events conducted on state highways.[3] Key event organizer actions typically performed upon receipt of an approved special event permit include:

- Notifying emergency service agencies of temporary road closures and access restrictions.
- Informing property owners and residents, located in the immediate vicinity of the event venue, of traffic and parking restrictions.
- Disseminating travel and parking information to community residents, representing potential event patrons, via media advertisements.

Application Components

Table 4-8 summarizes the various items that appear, in a questionnaire format, on a special event permit application. The application serves to communicate event operations characteristics to a jurisdiction, thus permitting it to impose appropriate impact mitigation requirements and/or advise the event organizer to change event operation parameters. Key items include the event purpose that may signal the need to develop contingency plans in response to possible security threats or demonstrations. Information regarding event history and expected attendance assists in achieving a more predictable event travel forecast. The application should prompt the event organizer to indicate travel demand management initiatives, including use of carpools and other modes of travel. Appendix A contains a sample special event permit application from Virginia Beach, VA.

Table 4-8
Planned Special Event Permit Application Components

APPLICATION COMPONENT	SPECIFICATIONS
Event sponsor/ organizer	• Organization, corporation, community group, etc. sponsoring event in addition to professional firm/agency contracted to produce the event.
Primary contact and coordinator	• Decision-making authority and continuously available through the day-of-event activities phase. • Mailing address, e-mail address, phone (day/night/cell/radio frequency), and fax. • Location on day-of-event.
Event name/ type of event	• Name used to advertise event.
Event date and time	• Event date(s). • Hours of operation on each event day. • Duration of event (if street use event). • Proposed timeline of activities through the event day(s). • Rain date.
Event location	• Location (e.g., street address). • Venue attendance capacity. • Temporary venue, permanent venue, on-street. • Zoning classification of property and/or present use of venue site. • Alternate location.
Event purpose	• Description of event. • Indication whether event differs from previous years. • Indication if event is political in nature.

Table 4-8 (cont'd.)
Planned Special Event Permit Application Components

APPLICATION COMPONENT	SPECIFICATIONS
Event history	• Number of times event has been held. • Event produced in other cities. • Receipt of a special event permit in the past by the event organizer. • Event organizer's experience in handling special events.
Expected attendance	• Attendance per day. • Peak attendance at any given time. • Number of participants and spectators. • Basis for projection. • Attendance at past event occurrences. • Target age group (e.g., percent attendance by age group). • Estimated number of vehicles generated (cars and busses).
Event preparation	• Set up and tear down (date and time) • Description of required activities.
Audience accommodation	• Admission charge. • Parking charge.
Street use event route	• Route to be traveled or occupied. • Assembly location and time. • Completion point. • Rest stop areas. • Estimated length of parade (front to rear). • Maximum interval of space to be maintained between parade units. • Minimum and maximum speed of the parade. • Number and type of parade floats/vehicles. • Number of pedestrians and number/type of animals in parade.
Street closures	• Reason for using a non-local roadway. • Street segments (indicate by cross streets) and direction of travel. • Use of entire street width for event. • Occurrence of event in intersections. • Bridge closure. • Closing date and time and opening date and time. • Affected bus transit routes.
Traffic control	• Name of private company providing traffic control equipment. • Date and time of temporary traffic control equipment setup and removal. • Overview of directional signing, number and type of sign.
Access and parking	• Available emergency vehicle access. • Sidewalk and parking lot closures. • Use of public parking lots intended. • Establishment of reserved/VIP parking areas. • Use of off-site parking areas. • Covering of parking meters.
Transportation	• Narrative on anticipated congestion impacts and proposed mitigation. • Special arrangements for dignitaries. • Use of a charter or express service intended. • Use of public transportation intended. • Development of initiatives to encourage transit use.

Table 4-8 (cont'd.)
Planned Special Event Permit Application Components

APPLICATION COMPONENT	SPECIFICATIONS
Personnel	• Number of volunteers and staff working the event. • Intended volunteer work assignments. • Number of staff working in a supervisory capacity. • On-site communications, cellular or radio.
Event notification and advertisement	• Notification of other involved jurisdictions and whether a permit has been obtained. • Use of media to advertise event (radio, television, print, Internet). • Use of a process to notify affected property owners and residents.
Dismantling and clean-up	• Restoration of roadway right-of-way and other public property. • Clean-up start and end times.

Table 4-9 lists supplemental requirements to a special event permit application, required of the event organizer either at the time of initial application submission or after jurisdiction review of the application questionnaire. Traffic flow plans that specify a street use event route should identify any: (1) hindering of access by authorized emergency vehicles, (2) conflict with bus transit routes, and (3) interference with non-event attendee access to hospitals, airports, transit stations, businesses, churches, and other public buildings. Traffic control plans should address in detail the service and protection of event patron traffic, the accommodation of emergency vehicles and background traffic, and the necessary traffic control equipment and personnel resources. The event site plan and parking plan must provide accessible parking and routes to the event venue. As an example, Table 4-10 shows Miami Beach, FL special event parking and site plan guidelines for compliance with the Americans with Disabilities Act.

Jurisdictions require event organizers to sign a *hold harmless* agreement and post a certificate of insurance, typically $1 million, before issuing a special event permit. Appendix A contains a sample hold harmless agreement from Evanston, IL.

Permitting Requirements

Jurisdictions maintain the following general requirements for planned special events: (1) event restrictions, (2) impact mitigation and traffic control, (3) legal, and (4) funding. As indicated in Table 4-11, the municipal codes of jurisdictions across the Nation specify a wide range of requirements for managing travel for planned special events, all of which become incorporated in the special event permit process. The previous sections highlighted several requirements and associated examples under the first three cited categories. With regard to traffic control, Appendix A contains a Hot Springs, AR checklist of traffic control requirements for street use events using a particular city street. This checklist serves as a traffic management and operations plan for *recurring* street use events on the cited street, thus permitting traffic management team members to become proficient at efficiently managing traffic for events on the designated route. Appendix A also contains a detailed traffic control resource checklist, complete with equipment specifications, used in Montgomery County, MD and special event directional sign regulations maintained in Marco Island, FL.

Table 4-9
Planned Special Event Permit Application Supplemental Requirements

APPLICATION COMPONENT	SPECIFICATIONS
Event site plan	• Identify access points/gates, traffic circulation, lighting, and sign locations. • Show location of fencing, barriers, and/or barricades including temporary fencing that can be removed for emergency vehicle access. • Show adjacent external roads. • Show emergency and handicap accessible routes. • Identify location for a command/communication center. • Provide computer-assisted drawing.
Traffic flow plan	• Provide map of street use event route. • Show street use event staging and disbanding area. • Indicate required sidewalk, street, and parking lot closures. • Indicate affected transit routes and proposed mitigation. • State locations and/or parking meter numbers that require covering. • Indicate traffic flow routes and capacity (e.g., number of travel lanes, etc.)
Traffic control plan	• Specify temporary directional sign, advance warning sign, barricade, and traffic cone locations. • Conform to Manual on Uniform Traffic Control Devices specifications. • Allow for a continuous, through traffic lane, typically 20 feet wide, on closed roads for use by public safety personnel in an emergency. • Show proposed alternate routes. • Indicate how normal traffic pattern will be accommodated. • Describe how local resident and commercial traffic has access during the event. • State what stakeholder furnishes, installs, and removes traffic control equipment. • Specify temporary, removable pavement markings only. • Provide traffic control agent or law enforcement officer (signalized intersections especially) at all intersections requiring traffic control. • Provide volunteers to monitor barricades at all intersections not requiring traffic control personnel. • Indicate pedestrian access routes and major pedestrian crossings.
Parking plan	• Show parking sites (e.g., paved and unpaved) and access points. • State the number and size of vehicles planned to stage for the event in addition to the staging location. • Accommodation of media vehicles. • Indicate number of spaces available. • Include valet parking and route. • State the number of parking staff required. • Indicate parking lot assignments (e.g., permit, public, fee), costs, and vehicle processing procedures.
Emergency evacuation plan	• Evacuation routes.
Notice of event for affected property owners and residents	• Present event concept. • Indicate travel impacts in addition to planned parking and traffic restrictions. • Distribute to residents, businesses, schools, places of worship, and other affected entities.
Event advertising brochure	• Provide event operations information (e.g., times, dates, ticket information). • Indicate travel information (e.g., directions, parking, travel incentives).

Table 4-9 (cont'd.)
Planned Special Event Permit Application Supplemental Requirements

APPLICATION COMPONENT	SPECIFICATIONS
Hold harmless agreement	• Specify that event organizer agrees to defend, indemnify, and hold a municipality, including its officers and employees, harmless from any liability or claim caused by the event organizer failing to fulfill all obligations.
Certificate of Insurance	• Require event organizer to obtain and name the governing municipality and its employees as insured. • Name transportation agencies as insured. • Ranges from $500,000 to $1,000,000.

Table 4-10
Guidelines for Compliance with the Americans with Disabilities Act[4]

REQUIREMENT
• All on-site accessible pedestrian routes from accessible parking to the event must be equipped with curb cuts or temporary ramps. All ramps must meet applicable codes. • Additional disabled parking must be provided and staffed. A disabled parking area must be designated and located near to the main entrance and accessible to pedestrian routes. Necessary signs must be provided to indicate this parking area. An accessible shuttle may be used for remote parking areas. • All Americans with Disabilities Act considerations must be identified on the site plan.

Section 12200 of the California Vehicle Code defines a *special event monitor* as a person who has completed a traffic control program approved by the California Highway Patrol. Use of special event monitors reduces demand on law enforcement staff needed for security detail and highway patrol. Jurisdictions in California require these trained monitors, when the day-of-event training program is available, during permitted special events. For instance, the County of San Diego, CA specifies the following traffic control requirements during planned special events:

Table 4-11
Municipal Code Provisions on Planned Special Events

PROVISION
• Special event definition • Conditions for permit requirement • Permit restrictions • Content of permit application • Permit application submission and review deadline • Notification of city/town officials • Notification of abutting property owners and residents • Permit approval criteria • Event organizer duties • City/town authority to restrict parking and close local roads • Hold harmless clause • Insurance requirements • Recovery of expenses • Procedure for appealing a denied permit

- *Traffic control is to be provided at various locations, such as, narrow road segments, intersections, and starting or ending points.*
- *Only properly trained or certificated personnel (by a training program approved by the Commissioner of the California Highway Patrol) are to handle the traffic control responsibilities.*
- *Traffic controllers shall wear orange vests and utilize a "Stop/Slow" paddle.*
- *Advance warning signs shall be placed, well in advance of any personnel and the event, to alert oncoming vehicles of the supplemental traffic control and the event.*
- *Traffic controllers will avoid delays or back up of traffic onto primary County roadways such that "grid-lock" does not happen; waits of more than two minutes are excessive and will not be allowed.*
- *Adjacent driveways to neighboring businesses and residences will not be blocked.*

Funding

Public agencies recover costs incurred in providing services during the event operations planning phase and resources on the day-of-event through event organizer fees and other funding mechanisms. Table 4-12 lists special event permit application fees for a select number of jurisdictions across the country. Table 4-13 describes five different approaches used by jurisdictions to obtain cost reimbursement for staff and equipment rental.

After an August 2002 Grateful Dead concert attracted 35,000 spectators at an amphitheater in rural Walworth County, WI, and event stakeholders prepared to turn away thousands of expected ticketless spectators, county officials passed an innovative ordinance, *Recovery of Expenses Incurred for Providing Extraordinary Governmental Services*. Appendix A contains a copy of the cited ordinance, Section 10-28 of the Walworth County Code.

The social and economic benefits yielded by planned special events, in addition to the purpose of select events, result in jurisdictions periodically waiving cost reimbursement requirements even for privately sponsored special events. Table 4-14 lists criteria that planned special events in Louisville, KY must meet for City provision of free services for event operation and management.

INFRASTRUCTURE SUPPORT 

Technology Applications

While the most critical aspect of managing travel for planned special events is the coordination of the many stakeholders involved, technology lends an assisting hand to the effort. Technology is fast becoming a mainstay in every aspect of transportation, from road maintenance and snow removal to incident management and emergency evacuation. Special event management is no different in this regard. The variety of technologies and their application serve to assist managers in both informing travelers of an upcoming event as well as monitoring and managing the event in real-time.

Most technology applications, as they relate to travel management, fall under the category of Intelligent Transportation Systems (ITS). ITS is comprised of a number of technologies, including information processing, communications, control, and electronics. These technologies are comprised of tools that can be deployed permanently for uses other than planned special events or

Table 4-12
Planned Special Event Permit Application Fees

LOCATION	PERMIT FEE	LOCATION	PERMIT FEE
Anaheim, CA	$25	Palm Beach Gardens, FL	$50 per event day
Fort Collins, CO	$25	Ypsilanti, MI	$50-$100
Lancaster, PA	$25	Charlotte County, FL	$87
Larimer County, WY	$25	Virginia Beach, VA	$75-$150
Louisville, KY	$25	Branson, MO	$100
Marysville, WA	$25	Clarksville, TN	$100
Stamford, CT	$25	West Des Moines, IA	$100
West Palm Beach, FL	$25	West Sacramento, CA	$125
Minneapolis, MN	$25 parade; $100 + $0.50/participant for race	Miami Beach, FL	$250 application fee; $250 permit fee
Lincoln, NE	$45	Mount Pleasant, TX	$250
Kane County, IL	$50	Pitken County, CO	$275
Marco Island, FL	$50		

Table 4-13
Planned Special Event Funding Mechanisms

FUNDING MECHANISM	COMMENTS/EXAMPLES
Event organizer pays a deposit with permit application submission.	• Applies to events necessitating road closure. Deposit is reimbursed if all road closure requirements are fully complied with ($500 – Larimer County, WY) • Requires $2,500 refundable security deposit no later than 30 days in advance (Miami Beach, FL). • Requires a $1,000 security deposit, returned if the transportation department determines the roadways are in good or better condition than before the event took place (Kane County, IL). • Requires a $25 deposit on each city owned traffic control device used during an event (Golden, CO).
Public agency sends post-event invoice to the event organizer for resources used.	• Allows event organizer to be charged for law enforcement, traffic engineering, and public works services. • Requires four-hour minimum charge for each public employee engaged by the event organizer (Miami Beach, FL).
Event organizer pays for estimated, required public agency resources before event.	• Requires event organizer pre-payment or bond posting before issuing an event permit (Anaheim, CA). • Requires event organizer to submit payment for services and equipment two weeks before the event (Miami Beach, FL). • Requires event organizer to pay for parking meter rentals ($10 per meter/day for Miami Beach, FL; 50% of the standard fees in Denver, CO) and rental of public parking lots (Ypsilanti, MI requires 20% gross revenue sharing) as applicable.
A charge on each ticket sold is set to recover expenses incurred for providing extraordinary governmental services.	• Establishes Ordinance No. 232-11/02 (Walworth County, WI).
Event organizer posts a performance bond.	• Covers post-event street cleaning and/or damages to roadway infrastructure.

Table 4-14
Louisville, KY Criteria for Providing Free Services for a Special Event[28]

CRITERIA
• Ability of the City to provide all or part of requested support services. • Extent to which the event is economically, socially, and culturally beneficial to the community. • Intended use by the sponsoring organization of any revenue over and above expenditures. • Impact of the event (positive or negative) on normal commercial activities. • Extent to which the event contributes toward the promotion of tourism.

deployed temporarily during the special event only. Table 4-15 discusses these technologies and implementation alternatives in more detail. Joining these technologies to our transportation system will save lives, save time, and save money.[6] In its infancy, ITS addressed incident management, but over time, it has become an application of management strategies to improve mobility in everyday responsibilities of transportation managers of various modes. Mobility may be defined as ability and knowledge to travel from one location to another using a multimodal approach. ITS not only benefits the transportation managers, but other service providers such as emergency service providers (e.g., police, fire, ambulance) and support providers such as towing services. In short, ITS has become a significant enabler for operating and managing the transportation network. ITS is a tool for transportation managers, and as such, it augments the many non-technical activities to plan and manage an event.

At one time, ITS was characterized as technology looking for a problem. Over the years, transportation managers realized the need to first identify needs and problems, and then associated solutions, usually technological, to those needs. As such, ITS applications are grouped into services they can provide, or more simply as functions. In the realm of managing planned special events, there are a number of functional areas that technology can support. The following sections describe these functional areas in greater detail.

Traffic Management

Traffic management is the most common function associated with special event planning and management. It includes the real-time detection, surveillance, and management of traffic conditions. In a typical event management scenario, managers and operators would monitor traffic, pedestrian, and parking conditions in real-time using various technologies, and modify control strategies such as modifying traffic signal and ramp meter timing, transit priority, opening gates for high occupancy vehicle (HOV) lane access, to name just a few. This function also forms the basis for collecting much of the information communicated to travelers. There are a number of specific management strategies that encompass traffic management:

- **Arterial traffic management** differs considerably from that of the freeway. While the basics are similar – detect or survey, verify, respond and inform – the strategies and tools are not. As a rule, streets do not have any available capacity compared to the using of a freeway shoulder, for instance. Parking can be removed, but there is an economic and social price to pay to remove parking. Two-way streets can be made to operate in one direction, but this, too, can come at significant cost.

  Successful arterial traffic management results from utilizing every bit of roadway capacity and adapting to changing traffic conditions. Typically, streets are

Table 4-15
Planned Special Event Technology Applications

ITEM	FUNCTIONS	DEPLOYMENT	APPLICATION	BENEFIT
Detectors	Traffic Management	Permanent – in field. Portable – on trailers for temporary deployment.	• Provides the managers at the Transportation Management Center (TMC) with reliable, real-time information on conditions in the field. • Collects various data, but the most common are vehicular or travel speed, volume and occupancy. • Includes inductance loop detectors and infrared or ultrasonic detectors placed in, over, or beside the highway. • Uses portable detection systems installed on trailers that allow for locating the technology anywhere in the event area that managers want to survey.	• Provides a status of real-time traffic conditions on the highway to managers so they may adapt their plans as conditions warrant.
Closed-Circuit Television (CCTV)	Traffic Management	Permanent – in field. Portable – on trailers or permanent structures for temporary deployment.	• Consists of one of the oldest and most reliable methods of surveying the network in real-time. • Uses cameras installed in the field to monitor conditions in real time. • Allows systems to be located temporarily for the event using trailer-mounted rigs. • Whether permanent or portable, provides managers at the TMC with real-time video of conditions on the highway, allowing them to adapt their plans accordingly.	• Provides managers instant information on the status of the highway, transit station, or pedestrian mall to managers to allow them to react quickly to issues, thereby minimizing impacts to users.
Transportation Management Center (TMC)	Traffic and Transportation Management	Permanent. Portable – in mobile trailer or van. Virtual – a single person connected to the central systems from any remote location.	• Serves as the nerve center where the event managers from various disciplines, transportation and other, work together to ensure close coordination. • Often includes a "situation room" where the event managers work, all the time being in contact with the control room. • Utilizes many technological tools at the TMC including: (1) map displays showing real-time traffic and transit conditions, (2) video display walls, (3) changeable message sign, (4) closed-circuit television control systems, (5) telephone and radio communications to communi-	• Provides a single location where all the managers of the agencies involved with the special event can work face-to-face and be able to communicate with their respective operators and field personnel.

ITEM	FUNCTIONS	DEPLOYMENT	APPLICATION	BENEFIT
			cate with their field liaisons, and (6) incident management and traffic signal control systems. • In most cases, consists of a government agency facility, but in some specialized cases, such as at stadium venues, the venue itself may house this coordination center.	
Mobile Telephone	Traffic Management Traveler Information	Portable.	• Provides common form of communication between event managers and field personnel. • Provides real-time traffic conditions to managers (i.e., manual detection) and permits receipt of real-time traffic conditions information through a paging service or by dialing into a telephone information system (see below).	• Allows managers to stay in communication with their field personnel at all times via cell phone. • As a traveler information device, transmits information on real-time conditions to digital telephones equipped to receive text messages. • There is a large potential market for this form of traveler information. • Requires timeliness since 3rd party Information Service Providers (ISPs) are used.
Personal Digital Assistants	Traveler Information Traffic Management	Portable.	• Sends real-time traffic conditions to pagers registered to receive the traveler information. • Allows two-way pagers (e.g., Blackberry™) to be used by field personnel to report problems or by travelers to do the same.	• Has a large potential market for this technology for traveler information. • Requires timeliness since 3rd party ISPs are used.
Internet	Traveler Information Advertising	Permanent. Accessible from any location with connectivity.	• Permits dissemination of information regarding new traffic patterns, restrictions, etc. (along with other information regarding the event) well in advance of the date(s) of the event. • Provides real-time information regarding the travel conditions along the affected routes, incidents that are impacting traffic flow, and available parking. • Aims to reach travelers *before they commence their trip.*	• Reaches large audience of pre-trip travelers. • Offers subscription e-mail service to notify traveler of an alert on their preferred routes. • As a rule, provides free service with the subscription to an ISP.
Changeable Message Sign	Traveler Information	Permanent – in field.	• Informs travelers (en-route) prior to the upcoming event of	• Reduces congestion by informing motor-

ITEM	FUNCTIONS	DEPLOYMENT	APPLICATION	BENEFIT
	Advertising	Portable – on trailers for temporary deployment.	its expected impact, infrastructure changes (e.g. road or lanes closures, parking restrictions). • Provides real-time traveler information during the event (e.g., roadway conditions, incidents, parking availability).	ists in advance of the event so they may alter their routes or mode choices. • Informs en-route travelers of potential problems such as full parking areas.
Highway Advisory Radio	Traveler Information	Permanent – in field. Portable – on trailers for temporary deployment.	• Similar to CMS, informs en-route motorists of an impending problem ahead. • Typically uses warning signs to inform motorists that an important message is being broadcast. • Allows messages to be controlled from a remote location, such as a TMC. • Technologically, consists of a low-power (e.g., 10-watt) transmitter located near the roadside.	• When applied correctly, provides significant benefit to en-route motorists who must be advised of a traffic incident or congestion ahead.
Telephone Information System	Traveler Information Traffic Management	Permanent – call center remains at a fixed location.	• Provides a phone-in service to provide real-time traffic condition information to en-route and pre-trip travelers. • Stores real-time conditions in a database. Callers, with the help of computerized telephony, are routed to a recording of, or a live operator stating real-time conditions on the segment of highway requested by the caller. • As a national 511 initiative, serves as both a traveler information and traffic management tool, in that it provides current traffic conditions to callers as well as allows callers to report incidents on the network.	• Serves as a very useful tool in providing current traffic conditions to travelers. • Often can be an expensive undertaking. • Has generated a number of success stories during the 511 program's short life.
Traffic Signal System	Traffic Management	Permanent – Closed Loop Signal Systems. Permanent – Centrally controlled traffic signal systems. Permanent – Centrally controlled adaptive signal systems.	• Signal systems are commonly installed along arterial streets to optimize traffic flow and minimize delay. • Closed Loop Signal Systems and Centrally controlled signal systems allow system operators to download and implement special signal timing plans for special event management. These plans will optimize traffic operations during event ingress and egress. • Adaptive traffic signal systems, due to a high level of detectorization and sophisticated system	• Increases the efficiency of the street network and reduces the delay on the network.

ITEM	FUNCTIONS	DEPLOYMENT	APPLICATION	BENEFIT
			programming, will adjust to event-generated traffic flows and optimize traffic operations during event ingress and egress. With adaptive signal systems, the engineering of event timing plans is largely accommodated by the system. However, adaptive systems are considerably more expensive to install than either Closed Loop or centrally controlled systems.	
Parking Information Systems	Traffic Management	Permanent.	• Outfits parking lots and garages with detection and surveillance technology to determine the available number of spaces. • Collects information via detection and surveillance technology that is then processed by algorithms in computer systems, and can determine what space is available, using actual counts and predictive algorithms. The parking status is then conveyed to signs at the entrance or to an advanced traffic management system to be placed on CMSs or broadcast on HAR or commercial radio. • At arenas or stadiums, alerts motorists not to exit from a freeway to a parking lot if it is full, and directs them to available parking locations.	• Reduces the circling pattern of vehicles in a downtown area by informing motorists of the unavailability of parking spaces.
Commercial Radio or Television Stations	Traveler Information	Permanent. Accessible from any location with connectivity.	• Broadcasts traffic reports on a regular basis, typically during peak traffic periods or periods of special events. The information is received from aerial spotters or advanced traffic management systems.	• If broadcasted in a timely manner, reaches the most travelers and provides them with information to change their route or mode to ensure the most efficient network for prevailing conditions.

managed by traffic signal systems, and one of the most beneficial signal strategies for planned special events is the use of modified timing plans to optimize traffic operations during event ingress and egress. Several strategies, having various levels of complexity, exist for managing traffic signal systems on arterial highways. The best strategies available for special event management in-

clude: (1) remote modification of the system, (2) individual signal timing in response to changing conditions, and (3) highly sophisticated adaptive control systems, which, due to a higher level of data acquisition and system programming, automatically adapt to changing traffic flows. Closed Loop Signal Systems, which are relatively inexpensive and are becoming widely used, offer a means of implementing planned system timing plans designed for a particular special event. Individual signals and system timing can be monitored and modified remotely from a transportation management center or any other location equipped with a personal computer and modem.

The more sophisticated centrally controlled traffic signals have a fixed communication system between the traffic signals and a control center. The traffic signals and signal systems under control are constantly monitored. These systems generally have a higher level of programming sophistication then the Closed Loop Systems. Planned special event management is accommodated in much the same way as with Closed Loop Systems, with special timing plans being downloaded into the system in response to event conditions. The timing plans are configured in advance, but as with Closed Loop Signal Systems, can be modified from a transportation management center in response to changes in the field.

Adaptive control systems represent the most sophisticated traffic signal systems. These systems require considerably more detector input and communication ability. Adaptive control systems rely on intricate software packages to produce an ever-evolving signal timing plan. These systems have the capability to continuously adapt to changing traffic patterns, thus optimizing traffic flow. With adaptive traffic signal systems it would not be necessary to download special signal timing plans in order to manage a special event. The adaptive traffic signal systems would automatically adapt to changes in traffic caused by additional event-generated traffic.

- **Ramp management** represents a freeway strategy that controls the amount of traffic entering and exiting a freeway in order to maintain or increase its efficiency. It is typically provided by means of metering or closing ramps. The theory behind metering is that the rate at which vehicles enter a freeway is controlled, reducing turbulence at ramp junctions where most congestion occurs. This, in effect, improves the efficiency of the mainline freeway, thus reducing a vehicle's overall trip time. Ramp closure is rarely used as a long-term solution, but can be implemented when the capacity of an entrance or exit ramp is exceeded and the resulting queues jeopardize safety.

- **Lane use management** is a process used to maximize benefits and use of existing pavement, and improve the safety and efficiency of freeway operations. Lane use management is typically exercised through use of signs (static and dynamic), temporary traffic control devices, economic incentives and disincentives, and law enforcement. Lane use management includes designating certain lanes for the use by a particular class of vehicles (e.g., buses, carpools), the use of shoulders as a traveled lane during peak periods, contra-flow lanes, reversible lane control, and lane use control. Lane use control uses dynamic

signing to indicate whether a lane is open (green arrow pointing down over a lane), closed (red "X" over a lane), or is closed ahead (a diagonally cocked color arrow over the lane).[7]

- **Incident management** represents an operational approach used on both freeways and arterials that employs all of the available resources, including human and technological, to identify, manage, and clear incidents from a freeway in a quick and effective manner. In the transportation management center, operators utilize networks of closed-circuit television cameras, vehicle detection sensors, incoming 911 or 511 reports, incoming media reports, and mobile reports (from service patrols, police, maintenance personnel, and motorists) to monitor, verify, and determine the scope of incidents to quickly dispatch the appropriate emergency response personnel and equipment. This saves valuable time when treating the injured and minimizes the effects incidents have on traffic conditions. After field personnel arrive at the incident scene, TMC operators continue to monitor the incident and conditions surrounding the incident to inform travelers of traffic conditions.[7]

- **Parking management** facilitates improved and sustained mobility - moving traffic through a location quickly, with little delay, and only once. Parking management supports effective mobility by managing parking facilities. In this discipline, systems monitor and survey the available capacity of parking facilities, both surface lots and garages, and communicate the availability or non-availability of spaces to motorists. In doing so, motorists do not congest the highway network by traveling from parking location to parking location in hopes of finding an available space.

Traveler Information

To ensure the successful management of a special event, it is vital to communicate with travelers to inform them of anticipated (future) and current conditions on the network:

- One goal is to provide the conditions information to en-route travelers so they may alter their route or mode, and to pre-trip travelers so they may alter their trip planning. Information that can be provided includes current traffic conditions, congestion, lane or turn restrictions, HOV restrictions, alternate routes, parking availability, and road closures and the relevant time periods.
- A second goal is to inform the public of the event well enough in advance to allow intended travelers, whether event attendees or not, to change their travel *habits* prior to the event.

Various means and technologies are used to disseminate information to the public. Information is provided to:

- Pre-trip travelers via websites, media broadcasts, and mobile communication devices (e.g., personal digital assistants, pagers, and cell phones).
- En-route travelers via roadside devices such as changeable message signs and highway advisory radio, and in-vehicle via commercial radio.
- Both pre-trip travelers and en-route travelers through mobile phones, web-enabled wireless phones, pagers and personal digital assistants (PDA).

In support of these functions, there are many technologies in the realm of ITS that have been incorporated for special event man-

agement. Not all of these are a single technological device, nor are all of the parts provided by the managing agency alone.

Funding Sources

Current funding practice typically favors building new or rehabilitating existing transportation facilities over operational improvements, such as freeway management systems. A key reason is that agencies do not consider operations as a distinct line item in their budget. Freeway management systems require both capital and maintenance funding. This topic has been under discussion for several years, and few agencies have been willing to attempt new approaches.(7)

Involvement by the freeway practitioner in funding processes and decisions cannot be over-emphasized. As noted in the Millennium Paper prepared by the Transportation Research Board Freeway Operations Committee, "If funding for deployment of freeway management systems and programs, and their ongoing operations and expansion, is not budgeted and the necessary resources allocated, the freeway investments will deteriorate and eventually become useless."(8)

Funding for ITS initiatives always has been a challenge and is tied in closely with how well we sell the concept of freeway operations and management. Because of tighter controls on money and a never-ending list of ways to spend it, there will continue to be challenges in the search for new sources of funding to continue expanding the existing infrastructure. Such new concepts as partnerships between the private and public sectors, outsourced design/build/operate contracts for transportation infrastructure projects, and user-pay scenarios will bring about new opportunities for funding. Expanding advertising, sponsorship, and "adopt-a-highway" plans to include traffic management will present options for funding operations. Partnerships to sell or share data and video signals will continue to provide new opportunities.(8)

The authority for transportation decision-making is dispersed among several levels, or "tiers", of government, and often between several agencies with each governmental level. The concept of special event management needs to be considered and supported at each of the different tiers noted below: (9)

- The **national** tier involves the authorizing legislation that establishes and provides direction, priorities, and resources for the federal regulations, policies, programs, and research that is initiated or implemented.

- The **regional/statewide tier** involves the appropriate strategic transportation planning, programming, and coordination efforts that include a longer-range time horizon (10 –20 years). Statewide and regional transportation planning is the structured process followed by states, metropolitan planning organizations, municipalities, and operating agencies to design both short and long-term transportation plans. Products are project-oriented, typically providing the Statewide and Regional (Constrained) Long Range Plan (LRP), Statewide Transportation Improvement Program (STIP), regional Transportation Improvement Program (TIP), and Unified Planning Work Program (UPWP). While the process has historically focused on capital projects, it is now recognized that the statewide/regional transportation planning process must take management and operations of the transportation network, and the ITS – based systems that support

operations, into consideration. This is particularly true given that ITS appears to be losing its special funding status that it enjoyed in ISTEA and TEA-21. The current trend to "mainstream" ITS (and operations) into the traditional decision-making process of transportation planning means that operations and ITS deployments will be increasingly funded through regular sources and compared with traditional transportation components, such as road widening and new construction. There is consequently a need to strengthen the ties between management and operations, ITS, and the transportation planning process.

- The **agency tier** is where the infrastructure comprising the surface transportation network (e.g., freeways, bridges, tunnels, streets, rail lines, rolling stock, traffic control/management devices) is typically owned. This level develops a multi-year program and budget that defines resources and commitments for a three to 10 year time frame, with updates every year or two. It is at this tier where priorities, budgets, and allocation of resources are established. From the perspective of freeway management and operations, it is at the agency level where the planning, design and implementation activities for the freeway management program (i.e. special event) take place. It is important that the process to develop the ITS – based strategic plan (or any such focused plan or project) support the overall transportation planning process; not compete with it. Moreover, the end products of these "focused" processes can and should be used to feed information back into the overall transportation planning process.

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CHAPTER FIVE
EVENT OPERATIONS PLANNING

Figure 5-1
Event Planning Team Meeting

PURPOSE

This chapter presents advance planning and stakeholder coordination activities conducted for a specific planned special event. It represents the first of three successive chapters on the event operations planning phase. The primary, interrelated products of the event operations planning phase include: (1) feasibility study, (2) traffic management plan, and (3) travel demand management initiatives. This chapter describes *initial planning activities*, summarizes *feasibility study* analysis steps specific to a planned special event, and highlights *external factors* affecting the scope of event impact on transportation system operations.

Practitioners can use this chapter as a tool to: (1) establish an event operations planning framework for guiding stakeholder activities throughout the phase, (2) assist in deciding whether to grant or deny preliminary approval to schedule a proposed planned special event based on predicted transportation system impacts and (3) determine traffic and parking demand, roadway capacity deficiencies, and unplanned scenarios that define that scope of traffic management plan required (Chapter 6) in addition to the need for developing travel demand management initiatives (Chapter 7).

INTRODUCTION 

This chapter helps practitioners to *hit the ground running* on advance planning for a specific planned special event. Compared to Chapters 6 and 7 which detail strategies and tactics for mitigating the impact of planned special events on transportation system operations, this chapter emphasizes, with supporting example case studies, the importance of facilitating a planning structure, stakeholder coordination, and comprehensive event assessment in generating event planning phase products that completely and accurately guide operations activities on the day-of-event.

A section on initial planning activities describes input data requirements for analyzing the event impact and discusses scenarios linked to particular events that may require the development of a contingency plan(s). The section lists transportation system performance objectives, and associated facility-specific measures of effectiveness (MOEs), that satisfy the customer service requirements of event patrons and other road user classes. It presents an event operations planning schedule and lists various products of the event operations planning phase. The section concludes by examining situations necessitating public involvement, summarizing the feasibility study and traffic management plan review process, and identifying successful policies and agreements for managing and operating a planned special event.

The event feasibility study section presents travel forecast process strategies and considerations for estimating modal split, event-generated traffic demand, and vehicle occupancy factors. It reviews techniques for identifying a market area and directional distribution of event-generated traffic. The section reviews methodologies for identifying and evaluating the sufficiency of available venue parking supply based on event parking demand and existing conditions. It specifies traffic demand analysis and roadway capacity analysis strategies, including the application of various traffic modeling and capacity analysis tools. To provide a lead-in to the following two chapters on event operations planning, the section describes a toolbox of mitigation strategies for adjusting event traffic generation levels as well as increasing transportation system capacity.

This chapter concludes with an examination of external factors that may create considerable impact on transportation system operations if ignored. A feasibility study may not account for issues such as available resources, weather, concurrent road construction activities, and concurrent planned special events. These factors must be accounted for early in the advance planning process as well as in traffic management plans prepared for a planned special event. For example, given a particular recurring event, event patrons and non-attendee transportation system users may realize satisfactory system operations during one event occurrence, then experience an unacceptable level of service during the next event occurrence. Such incidents occur when stakeholders do not account for various external factors, through scenario-based response plans, early in the event traffic management plan development process.

INITIAL PLANNING ACTIVITIES 

Overview

This section examines key planning initiatives and special considerations in order to help guide the user through the first steps of the event operations planning phase. The event operations planning phase begins with stakeholders establishing a planning frame-

work and schedule. The framework includes forming an event planning team, creating agreements, identifying performance goals and objectives, and deciding on mitigation assessment and approval protocol.

Special considerations evolve from reviewing the event operations characteristics of a particular special event (e.g., risk assessment) in addition to past successes and lessons learned. These considerations weigh heavy on traffic management plan requirements, and stakeholders must address issues affecting community residents and businesses through public outreach efforts early in the planning phase in order to ensure proper mitigation and non-conflict with traffic management plan specifications.

Stakeholder Roles and Coordination

The event planning team handles tasks associated with *event-specific operations planning* and *traffic management plan implementation*. Table 5-1 lists the primary responsibilities of the event planning team under the event operations planning phase. The event planning team consists of a diverse group of stakeholders with either event operations or community interest as their primary concern. The success of the event planning team depends on achieving strong coordination among participating team stakeholders.

Table 5-1
Event Planning Team Responsibilities During the Event Operations Planning Phase

RESPONSIBILITY
• Perform feasibility study. • Develop traffic management plan. • Evaluate travel demand management initiatives.

Event Planning Team Establishment

An event planning team forms as a result of either: (1) coordination among traffic operations agencies, transit agencies, law enforcement agencies, and event organizers that represent the core event planning team stakeholders or (2) designation by a committee on special events within a regional transportation management organization, such as a traffic incident management program.

- The former typically describes event planning teams formed in response to local planned special events affecting few jurisdictions, such as events occurring in rural or urban areas.
- The latter may occur in metropolitan areas where planned special events happen frequently, thus warranting an *on-call* event planning team.

A *regional transportation committee on special events* features stakeholders that have achieved interagency coordination through past, cooperative travel management efforts.

- Stakeholder representatives have first-hand knowledge of the roles, resources, and capabilities of each committee participant.
- Stakeholders commonly include traffic operations agencies, law enforcement, transit agencies, event organizers or venue operators, and the media.
- Committees in metropolitan areas may create task forces for specific planned special event venues or recurring planned special events (e.g., annual fairs, fireworks displays, parades, etc.). The committee or task force generally meets and performs event operations planning tasks on an as-needed basis. The group may also convene regularly (e.g., weekly, monthly, or quarterly) to review

program planning efforts for future planned special events.

Prior to initiating the event operations planning process, the core event planning team should adopt a mission, or purpose, and solicit buy-in from public agency stakeholders, the community, and other event support stakeholders. In identifying pertinent jurisdictions, the event planning team may consider contacting stakeholders within a certain distance (e.g., five miles) of the event venue. The event planning team can obtain buy-in from community interest stakeholders more easily when a core group of stakeholders already exists, including public agencies. Elected officials and the public can serve as advocates for the event planning team; therefore, participation from these stakeholders should occur early in the event operations planning phase.

Table 5-2 indicates the typical function of each participating stakeholder in generating the primary products of the event operations planning phase. A list of stakeholders is referenced to the three products produced: (1) feasibility study, (2) traffic management plan, and (3) travel demand management. Stakeholders contribute data, communicate needs, and/or furnish resources. Often, certain agencies promote initiatives developed by the event planning team, such as travel demand management strategies.

Table 5-2
Stakeholder Participation in Event Operations Planning

STAKEHOLDER	PRODUCTS OF THE EVENT PLANNING TEAM									
	FEASIBILITY STUDY			TRAFFIC MANAGEMENT PLAN			TRAVEL DEMAND MANAGEMENT			
	INPUT	DEVELOP	REVIEW	INPUT	DEVELOP	REVIEW	INPUT	DEVELOP	REVIEW	PROMOTE
Traffic Operations Agency	•	•	•	•	•	•	•	•	•	•
Law Enforcement				•	•	•				
Event Organizer	•			•	•			•		•
Fire and EMS				•	•	•				
Elected Official			•	•		•			•	•
Transit Agency	•			•	•		•	•		•
Public			•	•		•	•		•	
Private Transportation Consultant		•		•	•		•	•		
Private Traffic Control Contractor				•						
Media										•
Office on Special Events			•			•				
Emergency Management Agency				•		•				
Regional Organization			•			•	•	•	•	•

Interagency Coordination

In establishing an event planning team, the core stakeholders must develop a working trust with each other. This trust results when stakeholders realize that a planned special event necessitates the same relationships cultivated in daily traffic and incident management.

A joint operations policy or other memoranda of understanding strengthens the cooperative bond among core stakeholders. These agreements identify common goals and responsibilities of the partnering agencies.

Consensus among stakeholders builds interagency coordination and an understanding of each agency's responsibility. Key elements to consider include:

- Participating stakeholders must recognize that the motivations of individual agencies may differ from the event planning team's concerns as a result of their day-to-day responsibilities.
- Although the event planning team does not have authority over individual stakeholders, the planning team must realize that possible conflicts may exist between the team's objectives and a stakeholder's primary responsibility. Understanding this is key to overcoming such a problem; yet, the team can foster a cooperative spirit among stakeholders by emphasizing that participants *own* a part of the event planning team's common goals. In turn, team goals and objectives create incentives for individual stakeholders.
- Stakeholders must remain focused on the goals and objectives of the event planning team in order to effectively support and contribute in the event operations planning process. This includes concentrating on tasks that can be successfully accomplished collectively.

Common barriers to the event planning team's progress include *resource constraints* and *jurisdictional barriers*.

- Resource or funding constraints surface when stakeholders assign a lower priority to the planned special event. In satisfying individual and team goals, stakeholders may have to make temporary project and program sacrifices, in terms of personnel and equipment reassignment, to provide adequate benefits to the event operations planning effort.
- Jurisdictional barriers arise when two or more stakeholders are unclear on their duties and responsibilities. Do not allow participating agencies to feel left out. At the time of buy-in, the event planning team must indicate which stakeholders are required on an as-needed basis. The team must have the ability to communicate effectively with stakeholders having a peripheral involvement in the overall planning effort.

Risk Assessment

Based on the type and purpose of a planned special event, there exists potential scenarios where event patron or non-attendee behavior may cause overcrowded conditions in the vicinity of an event venue and/or create unplanned road closures. The event planning team must assess the nature of a proposed event and determine the need to incorporate special contingency plans in response to potentially dangerous situations that will interfere with the planned travel management on the day-of-event.

Table 5-3 lists four notable event-oriented risk scenarios associated with some planned special events. This section further

Table 5-3
Summary of Event-Oriented Risk Scenarios

EVENT-ORIENTED RISK	EXAMPLE SCENARIO
Demonstration or protest	• Any event that is political in nature or invokes social concern. • Political conventions and parades
Ticketless event patrons causing overcrowding	• Sold-out sports championship games • Sold-out concerts involving select performers
Fan celebration	• Response to city or school sports team winning a championship.
Event patron violence	• Motorcycle rally violence between patrons and/or participants.

describes these scenarios and highlights example case studies that illustrate resulting impacts on advance planning and/or day-of-event operations. Chapter 6 provides detailed guidance on contingency planning in addition to the development of specific strategies (e.g., alternate route plans) needed to effectively respond to certain unplanned scenarios.

Demonstration or Protest

Certain political or socially controversial planned special events may provoke a demonstration or protest. Those attending the demonstration represent non-attendees, and the event planning team often has little or no advance information regarding the demonstration's specific location and time of occurrence. The event planning team should obtain access to relevant law enforcement intelligence reports regarding potential demonstrations to develop an effective travel management contingency plan. The threat of an unplanned road closure should prompt the event planning team to consider developing an alternate route contingency plan detailing the personnel and equipment resources necessary to effect an immediate diversion of traffic.

Appendix B contains a contingency diversion routing plan prepared in response to the potential for demonstrations during the 2000 Republican National Convention in Philadelphia, PA.

Overcrowding

The occurrence of sports championship games or major concerts at venues having a defined *sell-out* capacity may attract *ticketless* event patrons not accounted for in event travel forecasts and impact mitigation strategies. Events such as the Super Bowl or National Collegiate Athletic Association (NCAA) Final Four cause an increase in area visitors beyond the actual event participants and patrons. Sold-out music festivals may attract persons wanting to tailgate in venue parking areas despite not having a ticket.

For instance, event planners originally anticipated 200,000 people to attend a two-day *Grateful Dead* reunion concert at a 35,000 seat amphitheater in rural East Troy, WI, located approximately 30 miles southeast of Milwaukee. The Walworth County Highway Committee initially denied the event organizer a permit to hold the two concerts. After the event organizer unveiled a comprehensive security and traffic management plan that included using advance checkpoints to turn away any vehicle that contained a ticketless occupant, county executives overturned their decision and issued a permit.[1] Appendix B contains a list of restrictions imposed by the event organizer and event planning team to prevent ticketless event patrons from gaining access to the venue parking areas.

Fan Celebration

Another severe impact risk associated with sports championship games involves fan celebrations that occur when a city sports team wins a championship at home. In this case, the traffic management team charged with managing travel during event egress must also mitigate traffic impacts caused by non-attendees converging on the venue site and unruly fans disrupting traffic and pedestrian flow.

For instance, the Detroit Red Wings won the 2002 Stanley Cup in Detroit. Operating from past experience, the Michigan State Police began closing portions of Interstate 75 and the Lodge Freeway (State Route 10) leading to downtown Detroit and the event venue. This contingency plan went into effect at the start of the final period of play with Detroit leading the championship clinching game.(2) Contingency plan details were even posted in advance on Red Wings' fan websites. Located approximately 16 miles north of the event venue, Royal Oak police and city officials maintained road closure contingency plans to accommodate the thousands of fans that went to the popular clubs and bars to celebrate the home team win.(3)

Event Patron Violence

An outbreak of violence among event patrons warrants special security precautions to contain and capture potential suspects. Law enforcement may initiate a road closure as a first response to discourage people from entering and leaving the region where the violence took place.

During the 2002 Laughlin, NV River Run motorcycle rally, attended by tens of thousands of motorcycle enthusiasts, a multiple homicide occurred after a clash between rival motorcycle gangs. In an effort to capture the homicide suspects, Nevada officials closed all highways and arterials serving Laughlin, including Nevada State Route 163 at the Nevada/Arizona border as shown in Figure 5-2. Trucks traveling U.S. 93, a North American Free Trade Agreement (NAFTA) designated trucking corridor, traverse State Route 163 because of prohibitions on crossing the Hoover Dam. Law enforcement maintained the road closures for a few hours.(4) A possible traffic management contingency plan prepared in advance of the described security incident would specify a regional alternate route plan coupled with regional traveler information.

Figure 5-2
Nevada State Route 168 Closure During Motorcycle Rally *(Photo courtesy of the Laughlin Free Press)*

Performance Goals and Objectives

The goals of managing travel for planned special events include *achieving predictability*, *ensuring safety*, and *maximizing efficiency*. Table 5-4 states performance objectives, for the previously defined classes of transportation system users, applicable to satisfying the overall goal of operations efficiency and safety. In meeting these performance objectives, the event planning team must target the goal of achieving predictability during the event operations planning phase. Table 5-5 presents common, easy-to-measure measures of effectiveness for assessing the performance

Table 5-4
Transportation System Operations Performance Objectives for Planned Special Events

USER CLASS	PERFORMANCE OBJECTIVE
Event patron	• Minimize travel delay to/from the event. • Minimize conflicts between pedestrians and vehicles. • Minimize travel safety hazards. • Minimize impact of traffic incidents. • Disseminate accurate, timely, and consistent traveler information. • Increase automation of traffic control. • Maximize site access service flow rates.
Non-attendee road user	• Minimize travel delay on major thoroughfares, freeways and major arterials. • Minimize impact on commuter and trucker travel time reliability. • Maintain required parking and access for local residents and businesses. • Maintain unimpeded access for emergency vehicles.
Transit user	• Maintain scheduled travel times. • Minimize transit bus dwell times. • Maintain required transit station parking for non-attendee transit users.

objectives that describe traffic operations. The event planning team should consider field studies to quantify existing MOEs at key roadways and intersections to calibrate capacity analysis software and computer simulation models applied during traffic management plan development. The identified MOEs represent day-of-event performance evaluation data, useful for: (1) making real-time adjustments to the traffic management plan on the day-of-event, (2) conducting a post-event evaluation of transportation system performance, and (3) referencing during advance planning for future event occurrences.

NCHRP Synthesis 311, *Performance Measures of Operational Effectiveness for Highway Segments and Systems*, reports on the state-of-the-practice of using performance measures for the monitoring and operational management of highway segments and systems.[5] It assesses the relative strengths and weaknesses of various performance measures. Based on a survey of current agency practice, the synthesis reports that performance measures associated with planned special event management are similar to traffic and incident management, but may also include performance measures related to clearance times (e.g., time for vehicles to clear a venue site area) and parking management measures.

Table 5-5
Measures of Effectiveness for Assessing Performance Objectives

LOCATION	MEASURE OF EFFECTIVENESS
Venue parking areas	• Occupancy and turnover rate • Arrival and departure service rate • Time to clear parking lots
Intersections	• Vehicle delay • Queue length
Freeways and streets	• Travel time and delay • Traffic volume to capacity ratio • Traffic speed • Number and location of crashes and other incidents • Traffic incident clearance time

Planning Schedule and Deliverables

Two deliverables, produced by the event planning team during the event operations planning phase, include the *feasibility study* and the *traffic management plan*, designed to mitigate impacts identified in the feasibility study. *Travel demand management* represents a key component of the overall

process when forecasted traffic demand levels approach or exceed available roadway capacity.

The previous chapter outlined a detailed special event permit process and identified advance planning deadlines applicable to the event organizer. In turn, Figure 5-3 illustrates a high-level event operations planning schedule for an event planning stakeholder group. The figure lists advance planning activities and potential stakeholder meetings and public hearings in a timeline relative to the planning deliverables. The schedule indicates other stakeholder planning initiatives, such as the development of a specialized transit plan to reduce event traffic demand.

The event planning team should:

- Obtain a completed special event permit application and commence work on the event feasibility study no later than 60 days prior to the event.
- Start developing the event traffic management plan and obtain all initial public input and recommendations no later than 30 days before the event.
- Set aside the final 14 days prior to the event for implementation activities in addition to event information dissemination.

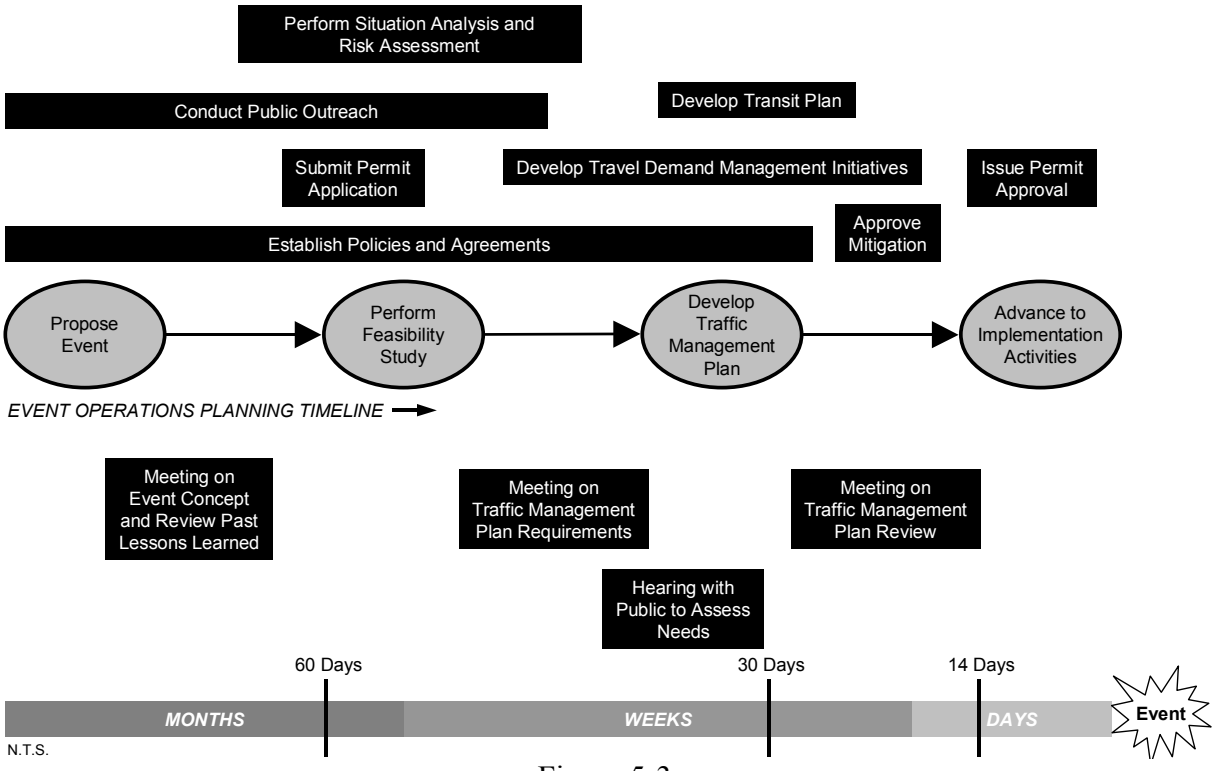

Figure 5-3
Event Operations Planning Schedule

The planning schedule provides a generic timeline, recognizing that actual event operations planning schedules vary considerably. For instance, some major, roving planned special events, such as the U.S. Golf Open, require an event operations planning phase spanning more than one year.

Public Outreach

Planned special events that may impact adjacent neighborhoods and businesses usually require public involvement to address related concerns. The public represents individual residents, businesses, and associated community groups. Public outreach activities initiated early in the event operations planning phase can reveal important issues that local residents and businesses may have. Soliciting these concerns through public involvement, and addressing the issues in the planning process, can improve relations and day-of-event operations.

Street use events or other planned special events that take place at venues located adjacent to residential and/or commercial districts may significantly impact non-attendee mobility and community quality of life. Specific neighborhood impact issues include heavy traffic demand on local streets and event patron use of available local on-street parking. These issues arise because, in some instances, event patrons may find on-street parking in residential neighborhoods and business districts affords more convenient ingress and egress. In addition, illegal parking fines may not exceed, or significantly exceed, the fee charged at designated venue parking areas.

Initiation of public outreach efforts includes stakeholders, such as a traffic operations agency or law enforcement, holding initial and regular meetings with community groups and local elected officials. At these meetings, the event planning team should present the scope of the event in enough detail to solicit quality input and buy-in from public stakeholders. Concerns revealed in this process should be addressed, and feasible solutions presented, so that the public stakeholders feel assured that impacts will be mitigated to their satisfaction.

The event planning team and public stakeholders should identify potential problems prior to the development of the traffic management plan. These problems can be identified by first understanding the event scope with consideration given to current neighborhood traffic and parking restrictions, traffic management plans deployed during past planned special events, and identified problems experienced during past events. With this information, the public stakeholders can make informed decisions and provide valuable input to the event planning team.

Example Case Studies

Innovative strategies developed by the cities of Seattle and Chicago to minimize neighborhood traffic and parking impacts during discrete/recurring events at a permanent venue are highlighted in three case studies summarized below. It should be recognized that an event planning team can implement these strategies on a temporary basis for less frequent continuous events and street use events.

Case Study One: University of Washington. Due to the construction of a new football stadium, the Seattle Seahawks moved their scheduled 2000 and 2001 home games to the University of Washington's Husky Stadium. Recognizing the Seahawks represented a

new and different stadium user with unique characteristics, the City of Seattle required development of a Seahawk Football Transportation Management Program.(6)

Key strategies included:

- The City of Seattle DOT, Seahawks organization, University of Washington, neighboring residents, and other City of Seattle officials conducted formal meetings prior to and during the Seahawks football season to listen to community concerns, report on operations, develop plan modifications, and review performance goal achievement.
- A hotline was established for local residents to voice concerns and to communicate day-of-event observations.
- Stakeholders responded by developing carpool parking pricing incentives and establishing new *restricted parking zones (RPZ)* in residential neighborhoods adjacent to Husky Stadium.
- The number of parking enforcement officers assigned to patrol the RPZs on the day-of-event increased from 6 to 13, and the Seattle Municipal Court approved an RPZ violation fine increase from $28 to $44 (although a $71 fine was initially proposed).
- Table 5-6 notes specific performance goals established by the event planning team to evaluate roadway system performance objectives for the 2000 Seattle Seahawks football season.

Case Study Two: Safeco Field in Seattle, WA. Safeco Field, home to baseball's Seattle Mariners, was constructed in 1999 and borders three neighborhoods. Recognizing the residential and business needs of these neighborhoods, the City of Seattle developed an Inaugural Season Transportation Management Program (TMP) for events at the stadium venue.(7)

Key strategies included:

- Participating stakeholders set the following TMP goal: *The primary goal, first and foremost, is reducing the number of vehicles, drive-alone and otherwise, associated with game attendance, thereby deflecting the traffic and parking impacts from the adjacent destination neighborhoods and the regional transportation system as a whole. The goals, which are stepped according to the kinds of and anticipated attendance, are expressed in vehicles per thousand attendees.*
- The Mariners organization, City staff, and the public formed the event planning team charged with developing the TMP.

Table 5-6
Seahawk Football Transportation Management Program Goals and Objectives(6)

GOAL	MEASURE	MEASURED PERFORMANCE	GOAL MET?
Travel reduction	No more than 195 cars/1000 attendees	182 cars/1000 attendees	Yes
Travel time	Within 5% of Husky game travel times	-0.1% to 4.7% different than for Husky games	Yes
Duration of post-game traffic	Equal to or less than after Husky games	35 minutes less	Yes

- The stakeholders focused on meeting numerous performance-based traffic demand mitigation requirements, varying by type of event and attendance levels, set by the Seattle City Council upon issuing a stadium master use permit.
- First year operation performance goals for Mariner's baseball games ranged from 330 (sell-out) to 345 vehicles per 1000 attendees. The permit specified third year operation and beyond performance goals ranging from 275 (sell-out) to 325 vehicles per 1000 attendees.
- A top priority for the TMP concerned deflecting special event parking impacts on the surrounding neighborhoods to the Seattle Central Business District.
- Table 5-7 lists specific measures considered by City officials to minimize on-street parking by event patrons in adjacent neighborhoods.

Case Study Three: U.S. Cellular Field in Chicago, IL. The City of Chicago DOT maintains a *Resident Parking Permit Program* to preserve legal on-street parking for residents of neighborhoods surrounding U.S. Cellular Field during all Chicago White Sox baseball games.[8]

Key elements of the Resident Parking Permit Program include:

- For residents living within the program area, the City issues one resident parking permit per registered vehicle in addition to one guest permit per resident.

Table 5-7
Measures Considered in Developing a Neighborhood Parking Management Plan for Seattle's Safeco Field[7]

PARKING MANAGEMENT OPTION
• Extend parking meter enforcement hours (until at least 10 p.m. and on Sundays).
• Replace existing meters with smart meters (programmable by season, allowing extended hours during baseball season, for instance).
• Impose time limits on parking after 6 p.m. with signs (rather than extend meter hours, place 2 hour limits on metered spaces after 6 p.m. and on Sundays).
• Impose time limits on parking after 6 p.m. with meter hoods.
• Enforce parking restrictions 7 days per week (8 a.m. to 6 p.m. on Sundays).
• Add new parking meters.
• Reduce parking meter duration limits (change some 2 hour meters to 1 hour or less).
• Replace 4 hour and unrestricted spaces with 2-hour spaces.
• Refine role of City's enforcement officers (add community/public relations function).
• Assess higher fines for parking infractions in the ballpark neighborhoods.
• Increase enforcement (additional parking enforcement officers on game days; multiple ticketing).
• Create residential parking zones.
• Increase number and/or size of loading zones.
• Create business parking zones.
• Discontinue access restrictions that temporarily remove on-street parking (before and after events).
• Discontinue parking prohibitions for stadium access (before, during, and after events).
• Parking space delineation in non-metered areas.

- The City also makes available guest parking permits for area businesses and churches to allow customers and congregation members to park in legal on-street parking spaces and gain access to off-street business/church parking within the program area.
- Figure 5-4 shows a sign enforcing the Resident Parking Permit Program.
- The City has a similar permit program in place for neighborhoods surrounding Wrigley Field, home to baseball's Chicago Cubs.

Figure 5-4
Chicago Resident Permit Parking Program Enforcement

Stakeholder Review of Planning Products

The previous chapter summarized various criteria for planned special event permit approval. However, as indicated in Figure 5-3, the event operations planning phase includes intermediate and final review periods for the event feasibility study and traffic management plan.

Stakeholder review concentrates on the identification and proposed mitigation of event travel impacts. Effective and rapid stakeholder review of event operations planning products requires: (1) an annotated planning timeline, (2) a review process, and (3) performance standards.

Annotated Planning Timeline

In cases where an event planning team collectively develops a feasibility study, traffic management plan, and associated mitigation strategies, an annotated planning timeline proves effective for monitoring team progress.

The Wisconsin DOT found such a tool useful for tracking specific traffic management planning and infrastructure deployment activities required to prepare for the opening of Miller Park in Milwaukee. The agency maintained a responsibility matrix listing each action item, the stakeholder responsible, the due date, and the present deployment status. An event planning team should establish an annotated planning timeline early in the event operations planning phase and use the tool to guide subsequent team meeting agendas as stakeholders develop event impact mitigation strategies and tactics.

Review Process

Adopting a formal review process reduces unnecessary delay in producing event operations planning deliverables required to stage a planned special event. Key aspects to be considered include:

- The review process should feature the oversight team monitoring and reviewing plans developed by the event planning team.
- The oversight team typically consists of mid-to-upper level representatives of

transportation agencies and law enforcement in addition to elected officials and ranking officials of other public agencies.
- A regional organization may assume the duties of an oversight team.
- Under a formal review process, an event planning team may seek oversight team approval of a feasibility study scope or conceptual traffic management plan prior to commencing work on the final deliverable. Both stakeholder groups interact again to review feasibility study results and final traffic management operations plans.
- Some jurisdictions have a *champion* charged with resolving institutional and operations issues affecting travel management for planned special events. These champions have the position to mitigate issues hampering the event operations planning process. Therefore, they should administer the review process.
- Jurisdictions should have an alternate official ready to replace the current champion should that person resign from present duty.

Performance Standards

This chapter included a review of various transportation system operations performance objectives and associated measures of effectiveness that stakeholders may use to monitor system performance on the day-of-event and, in turn, evaluate travel management efforts. During the event operations planning phase, stakeholders must set and agree to performance standards used to assess traffic impact mitigation proposals. These performance standards typically represent level of service (LOS) measures applicable to freeway and street segments, freeway junctions, and roadway intersections. Stakeholders assigned to develop mitigation strategies or review planned special event impacts on traffic should reference jurisdiction Traffic Impact Study guidelines defining accepted LOS thresholds. The LOS thresholds likely vary by roadway classification. In urban and metropolitan areas, jurisdictions may deem an LOS D, describing *high-density stable flow*, acceptable for freeways, arterials, and major intersections. Similarly, an LOS C, describing *stable flow*, may represent the allowable threshold for local streets and intersections. Small urban and rural areas may have more stringent requirements. Jurisdictions may relax their performance standards and allow LOS E operation, describing *unstable capacity flow*, on major roadway facilities for infrequent planned special events.

Policies and Agreements

The establishment of special policies and agreements to support planning and day-of-event management of planned special events facilitates efficient stakeholder collaboration and defines important event support stakeholder services that may be incorporated into a traffic management plan for a particular planned special event. These initiatives improve interagency relationships, clarify decision-making responsibilities and expectations, and secure on-call services and agency actions. For instance, a particular policy or agreement may intuitively support a contingency response plan to mitigate unanticipated congestion delay on the day-of-event. Stakeholders may develop policies and agreements specific to a particular planned special event or for all planned special events in a region. Because of the potential significant time to develop and approve a particular policy or agreement, stakeholders should establish these initiatives early in the event operations planning phase or during the program planning phase.

Table 5-8 summarizes four types of policies and agreements involving stakeholders responsible for event operations planning and/or day-of-event operations.

Interagency Agreement

Interagency agreements include a joint operations policy, memorandum of understanding, or mutual-aid agreement between two or more stakeholders. Table 5-9 lists components of interagency agreements. Appendix C contains an Illinois and Washington State joint operations policy, between state DOT and state police, that covers special event planning.[9,10] Stakeholders may also strike an interagency agreement, during the event operations planning phase, applicable to a specific planned special event.

Standard Street Use Event Routes

The development and use of standard street use event routes reduces the level and complexity of event operations planning tasks and overall planning time. In establishing such standard routes for parades and/or street races, stakeholders simplify planning tasks, thus creating a more efficient event operations planning process. The routes specify appropriate event starting and ending points coupled with staging areas for participant assembly and disbanding.

Use of a standard street use event route offers the following advantages:

- Allows reuse of traffic management and operations plans, with minor modifications as necessary.
- Realizes a cost savings for stakeholders.
- Allows for the development of standard signs, specific to the event route and associated alternate routes for background traffic, that may be reused for future street use events.
- Allows event patrons and non-attendee road users to become familiar with traffic patterns during recurring street use events, thus minimizing potential traffic problems on the day-of-event.

Toll Facility Congestion Policy

Suspension of toll collections on turnpikes and other toll facilities during periods of heavy congestion represents a new policy concept aimed at reducing congestion and the occurrence of traffic incidents at toll plazas. A toll facility congestion policy represents a congestion mitigation strategy applicable to planned special events. Both West Virginia and Maryland have experience with this policy:

Table 5-8
Summary of Policies and Agreements Applicable to Managing Planned Special Events

ITEM	EXAMPLE APPLICATION
Interagency agreement	• Joint operations policy between stakeholders that establishes a shared role regarding event operations planning and day-of-event travel management. • Memorandum of understanding defining stakeholder roles and responsibilities. • Mutual-aid agreement facilitating resource sharing and/or reimbursement for services.
Standard street use event routes	• Routes established under the program planning phase for recurring street use events such as parades and races.
Toll facility congestion policy	• Suspension of tolls during periods of heavy congestion.
Public-private towing agreement	• On-call towing and recovery services during a special event.

Table 5-9
Components of Interagency Agreements

COMPONENT
• Advance planning duties and responsibilities
• Day-of-event duties and responsibilities
• Organization
• Resource sharing
• Funding reimbursement mechanisms

- A West Virginia Turnpike policy, enacted in December 2002, allows Turnpike officials to open toll plazas for 15 minutes any time vehicle queues extend at least three miles upstream of the plaza. After the 15-minute period ends, officials can determine whether the queue dispersed or if another 15-minute period is required. Under normal operations, Turnpike officials estimate that a vehicle joining a three-mile queue takes approximately 15 minutes to pass through a toll plaza. Officials noted 15 minor crashes occurred on the Sunday after Thanksgiving in 2002, the Turnpike's busiest day of the year.(11)
- State legislators in Maryland debated a proposed bill in 2003 to create a similar policy for the Chesapeake Bay Bridge.(12) The bill specifies suspending tolls if a traffic queue extends more than five miles upstream of the toll plaza and is moving at less than 30 miles per hour. The increasing deployment of electronic tolling may obviate the need for these strategies in the future.

Public-Private Towing Agreement

Private towing companies perform a specific functional activity in traffic incident management, that is, removal of disabled or wrecked vehicles, spilled cargo, and debris from an incident site. Law enforcement and traffic operations agencies alike have recognized the indispensable role private towing companies have in effecting incident removal and restoring the affected road section back to normal operation. Public agencies commonly enter into agreements with one or more commercial towing companies to secure on-call traffic incident clearance services, or at a minimum, the agencies maintain a contact list of local private towing companies.

Traffic incident management represents a key consideration in event operations planning. Event planning team stakeholders may establish event-specific public-private towing agreements to secure *on-site* towing and recovery services. For instance, the City of Cincinnati has established, under the City rules and regulations for police rotation wreckers, a *special event tow* category.(13) The City defines a special event tow as "when tow operator remains with police officer for a specified period of time towing or moving vehicles as need arises." The City regulation specifies a special event tow rate of $20.00 per tow or $35.00 per hour, whichever is greater.

FEASIBILITY STUDY

Overview

The structure and approach of a planned special event feasibility study resembles a *Traffic Impact Study* required for planned developments, as illustrated in Figure 5-5. The figure shows the sequential steps in preparing a feasibility study for a planned special event.

Table 5-10 provides an overview of the first five feasibility study components. The accuracy of one analysis influences that of another. *Achieving predictability*, a goal of managing travel for planned special events, represents the focus of a feasibility study effort.

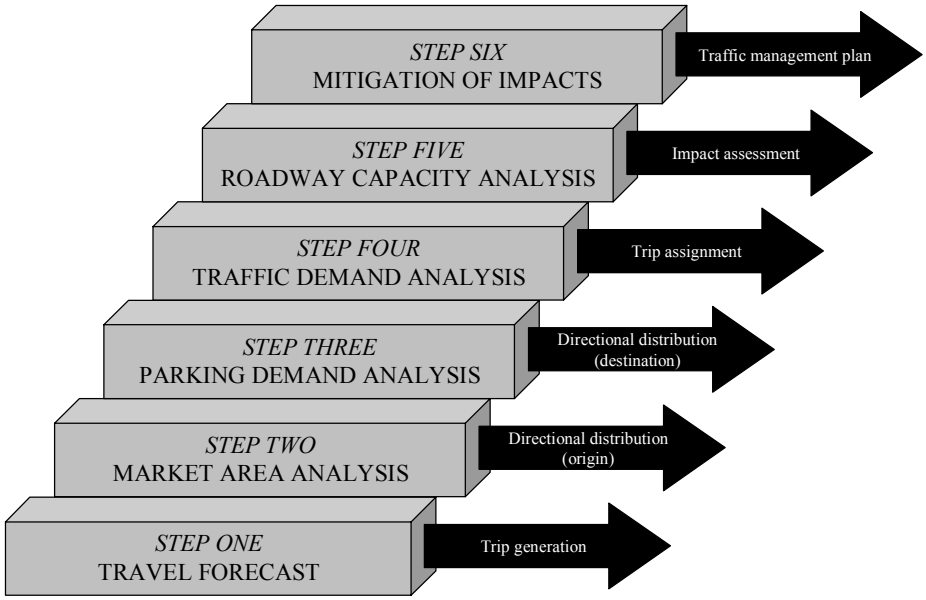

Figure 5-5
Feasibility Study Analysis Steps

Table 5-10
Feasibility Study Analysis Summary

COMPONENT	ANALYSIS	RESULT	APPLICATION
Travel forecast	• Modal split	• Number of trips by mode of travel	• Input into parking demand analysis. • Input into traffic demand analysis.
	• Event traffic generation	• Number of vehicle trips by personal automobile	
	• Traffic arrival rate	• Number of trips per unit of time	
Market area analysis	• Event trip origin	• Geographic location of event trip origins and percent split	• Input into traffic demand analysis.
Parking demand analysis	• Background parking occupancy	• Number of non-attendee vehicles per parking area and unit of time	• Input into event parking occupancy.
	• Event parking demand	• Number of event-generated vehicles per parking area and unit of time	• Input into traffic demand analysis.
Traffic demand analysis	• Background traffic flow	• Background traffic demand rate, adjusted for event-required road closures	• Input into roadway capacity analysis.
	• Event traffic assignment	• Event traffic demand rate per assigned route	
Roadway capacity analysis	• Section and point capacity	• Identification of capacity constraints and level of service	• Input into traffic management plan. • Input into travel demand management assessment.
	• Network operations	• Identification of bottleneck locations and saturation flow rates	

The feasibility study gauges the impact a proposed event has on traffic and parking operations in the vicinity of the venue. It determines if a particular planned special event will cause travel problems, where and when the problems will occur, and the magnitude of each identified problem using various MOEs. Initially, the study is conducted *without* roadway capacity improvements or initiatives to reduce travel demand. Once the feasibility study identifies event travel problems, practitioners can take steps to mitigate transportation system deficiencies. These results define the scope of the traffic management plan required to successfully manage travel for a planned special event.

Data Requirements

Feasibility study input data requirements reflect measures of the three core factors that determine the impact of the event: *travel demand*, *road/site capacity*, and *event operation*. Table 5-11 summarizes various types of input data to consider in a feasibility study. This includes *transportation system infrastructure*, *background traffic*, and *area* data and information. With the assistance of other event planning team stakeholders most data types are accessible.

Travel demand data is used to develop the event travel forecast and to determine the event area of impact. Background traffic data describes the scope of available roadway and parking capacity for event patron traffic. Information regarding the venue area assists in identifying possible event patron trip origins. For example, a venue located in a downtown area may attract a significant number of patrons arriving from work, thus possibly reducing the number of transit or vehicular trips generated. Events having a regional or greater scope may involve a significant number of patrons staying at area hotels. To increase travel forecast accuracy and meet the goal of *achieving predictability*, practitioners should research appropriate historical data.

The identification and quantification of site and transportation system capacity involves performing a full inventory of the transportation system infrastructure serving the event venue. This includes obtaining data on roadway geometrics and associated regulations (e.g., speed limits and travel restrictions). An inventory of freeway facilities should include the capacity of such freeway components as ramp junctions and weaving sections. In addition, street traffic control devices and signal timing plans must be identified and saturation flow rates determined.

Event operation characteristics impact both travel *demand* and available *capacity*. The knowledge of certain event logistics, combined with available historical data, can help predict the rate of event patron arrivals and departures over time. Practitioners, in tandem with the event organizer, must also identify the scope of road closures and parking area needed just to stage the event (e.g., parade/race route, hospitality areas, etc.). This does not include the roadway capacity and parking needed to accommodate event patron traffic.

Travel Forecast

Travel forecast analysis involves estimating: (1) modal split, (2) event traffic generation, and (3) traffic arrival rate. Event planning team stakeholders that typically collaborate on this analysis include a traffic operations agency, traffic engineering consultant, transit agency, and event organizer. The event organizer supplies key input data regarding event operation. The transit agency assists

Table 5-11
Feasibility Study Data Requirements

FACTOR	INPUT DATA	DESCRIPTION
Travel Demand	• Event patron traffic	• Daily attendance • Event patron demographics (e.g., advance/season ticket holder place of residence or zip code) • Admission (general/reserved seating and free/cost) • Venue attendance capacity • Acceptable walking times (e.g., to determine available parking areas and percent walking trips)
	• Background traffic	• Hourly traffic volumes • Existing parking occupancy • Vehicle classification
	• Venue area	• Employment centers in venue vicinity (e.g., number of jobs) • Hotels in venue vicinity
	• Historical data (similar events)	• Attendance (e.g., trip generation rate) • Hourly traffic volumes • Parking demand (e.g., parking demand rate) • Vehicle occupancy • Hourly/sub-hourly event patron arrival and departure distribution • Modal spilt • Patron survey (e.g., demographics and travel)

Road/Site Capacity	• Roadway facilities	• Existing, areawide roadway network
		  ○ Freeway and arterial corridors
		  ○ Local street facilities connecting corridors and the venue site
		• Location and capacity of site access points
		• Pedestrian (e.g., sidewalks and crossings) and bicycle accommodation
		• Geometrics, regulations, and lane assignments
		• Traffic control devices and traffic signal programming data
		• Toll plazas (freeway or bridge/tunnel) in venue vicinity

	• Parking availability	• Location and capacity of site access points • Location and capacity of off-street venue parking areas (free and paid) • Location and capacity of permitted on-street parking areas • Location and capacity of overflow parking areas
	• Transit availability	• Number and location of transit stations serving venue (e.g., public transportation – bus and rail) • Scope of transit services at identified stations (e.g., schedule and capacity) • Origin and scope of established express and charter bus service to venue (e.g., scheduled bus service from park and ride lots for special events only) • Base transit spilt (e.g., without incentive or promotion)
Event Operation	• Event logistics	• Venue location • Event hours of operation • Site opening and closing times • Participant accommodation (e.g., arrive by bus, stay at hotel near venue, etc.) • Event personnel and volunteer travel demand
	• Site	• Required road closures to stage event
	• Parking	• Number of parking spaces lost in order to stage event (e.g., parking for event participants, hospitality tents, etc.)

in estimating modal split. The traffic operations agency or traffic engineering consultant performs the analysis, and either stakeholder may research historical traffic and parking data or maintain a data archive related to operations for similar planned special events.

Modal Split

Under the scope of a feasibility study, modal split concerns identifying the existing modes of travel event patrons will use to access the event venue site. Common travel modes include personal automobile, public transit, and walking. Public transit refers to scheduled bus transit or commuter rail. Transit agencies may assist in determining a base transit split, without service incentives or promotion, for patrons traveling to/from the event.

Illustrated in Figure 5-6, some patrons of the 1986 and 1995 U.S. Golf Open in rural Southampton, NY found the Long Island Rail Road commuter rail service an efficient and convenient mode of travel to/from Shinnecock Hills Country Club. To assure consideration of appropriate roadway mitigation, transportation operations planners analyzed a range of modal split percentages in the feasibility study to account for various scenarios. Commuter rail or other people mover systems exist in several metropolitan areas across the Nation and usually provide regular service to city stadium and arena venues. Transit availability includes scheduled express and charter bus service operating from other cities, suburban park and ride lots, and city neighborhoods.

Table 5-12 lists surveyed modal splits for discrete/recurring events at a permanent venue in San Francisco, New York, and San Diego. The baseball stadium venues in San Francisco and New York, located within a metropolitan area, have excellent scheduled transit service, including commuter rail. Stadiums located in suburban areas, such as Qualcomm Stadium in San Diego, and rural areas generally have a high percentage of automobile trips.

Travel time, travel convenience, parking accessibility and cost weighs significantly on an event patron's decision to drive or utilize an alternate mode of travel. This likely represents another contributor to the high transit split in the San Francisco example, where Pacific Bell Park resides adjacent to the downtown area. Other modes of travel include bicycle and taxi.

Figure 5-6
Commuter Rail Modal Split

Walking trips deserve consideration in modal split estimates for planned special events occurring at downtown venues. Practitioners must consider the proximity of

Table 5-12
Example Modal Split for Discrete/Recurring Events at a Permanent Venue

EVENT	ATTENDANCE	MODE OF TRAVEL			
		AUTO	TRANSIT	WALKING	OTHER
San Francisco Giants weekday baseball game – August 2000[14]	38,000 – 41,000 (capacity 41,000)	48%	41%	8%	3%
San Francisco Giants weeknight baseball game – August 2000[14]	38,000 – 41,000 (capacity 41,000)	50%	37%	7%	6%
San Francisco Giants weekend baseball game – August 2000[14]	38,000 – 41,000 (capacity 41,000)	58%	34%	5%	4%
New York Mets weeknight baseball game – June 1997[15]	18,000 (capacity 56,500)	59%	41%	--	--
San Diego Padres weekday baseball game – April/May 1998[16]	Unknown	85%	12%	--	3%
San Diego Padres weeknight baseball game – April/May 1998[16]	Unknown	95%	5%	--	--
San Diego Padres weekend evening baseball game – April/May 1998[16]	Unknown	85%	12%	--	3%

employment centers, residential developments, and hotels to a planned special event venue before dismissing walking as a viable travel mode. Venues located on university campuses typically draw a measurable percentage of walking trips. Surveys for college football games have reported as many as 10 to 25 percent of event patrons arriving by foot.[17]

Practitioners can best obtain measured data on planned special event modal split through conducting a survey of event patrons. Appendix D contains an Internet-based event patron evaluation survey for those attending the 2003 Fair Saint Louis festival. In addition to querying event patrons on mode of travel, obtaining origin location information (e.g., zip code) assists event planning team stakeholders configure transit schedules or express and charter bus services for future similar events.

Event Traffic Generation

Unlike other traffic generators such as commercial developments, planned special event practitioners typically have advance knowledge of event attendance and, in turn, can develop traffic generation estimates via vehicle occupancy factors. On the other hand, traffic generation rates, based on event traffic volume or parking occupancy data, may not be appropriate for transfer and application from one special event to another. Too many variables exist with regard to event category, event logistics, event popularity, weather, and parking characteristics. Event operations and other external variables affect any application of historical data to future events.

Table 5-13 outlines a two-step process for forecasting event traffic generation. Input data includes a modal split estimate since

Table 5-13
Traffic Generation Forecast Process

COMPONENT	DETAIL
Input data	• Daily attendance • Percent automobile trips • Vehicle occupancy factor
Method	***Step 1.*** (Daily Attendance) x (Percent Automobile Trips) = Person Trips Via Automobile ***Step 2.*** (Person Trips) / (Vehicle Occupancy Factor) = Vehicle Trips
Result	• Number of vehicle trips by personal automobile both to and from the event

the traffic generation forecast aims to estimate the number of event-generated trips by personal automobile. In the absence of a daily attendance estimate, practitioners can use percentage of venue capacity as a base. However, many continuous events or street use events do not have a pre-specified venue capacity. Continuous events, such as fairs and festivals, often run for two or more days. Attendance generally fluctuates greatly from day to day, with Saturday operations yielding the highest daily attendance. A study of two-day (Saturday/Sunday) festivals in West Virginia indicated 58 percent of the total festival attendance was on Saturday.[18] The same study noted the following total event attendance distribution for three-day festivals: 20 percent on Friday, 50 percent on Saturday, and 30 percent on Sunday. It should be recognized that daily attendance reflects scheduled headline entertainment or other main festival events.

Vehicle occupancy factors can serve as the basis for estimating event-generated traffic. Table 5-14 lists average vehicle occupancy factors for select discrete/recurring events at a permanent venue and continuous events. A discrete/recurring event at a permanent venue that occurs on the weekend will likely have a higher vehicle occupancy factor due to families and groups of tailgaters. A vehicle occupancy factor of 2.5 persons per vehicle represents a common assumption, however for forecasting purposes, practitioners should consider a range of factors from 2.2 to 2.8 depending on local conditions.[15]

Traffic Arrival and Departure Rate

In order to estimate peak traffic volumes generated by an event, practitioners must estimate the time and scope of peak traffic flow during event ingress and egress. Traffic arrival and departure rate indicates the peak period (e.g., hour or 15 minute) of event-generated traffic. The rate is used to determine the following key parameters for input into the traffic demand analysis: (1) peak period time and (2) percent of total event-generated traffic within the peak period. Event operation characteristics that influence traffic arrival and departure rates include:

- Event time and duration – e.g., specific start time, abrupt end time, continuous operation.
- Event time of occurrence – e.g., day/night, weekday/weekend.
- Audience accommodation – e.g., reserved seating, general admission.
- Event type – e.g., sports/concert, fair/festival, parade/race.

This section focuses on estimating the traffic arrival rate. The temporal share of event patron arrivals vary considerably by event type and requires prediction by practitioners. Traffic arriving to an event can potentially cause greater impacts to background traffic mobility than event departure traffic. This is attributed to arrival traffic typically traveling from high-capacity roadway facilities (e.g., freeways and arterials) to low-capacity facilities (e.g., venue access roads). Roadway

Table 5-14
Example Planned Special Event Vehicle Occupancy Factors

EVENT	ATTENDANCE	AVERAGE VEHICLE OCCUPANCY
Discrete/Recurring Event at a Permanent Venue		
San Francisco Giants baseball games – August 2000[14]	38,000 – 41,000 (capacity 41,000)	2.8 persons per automobile
Anaheim Angels weeknight baseball game – July 1997[15]	18,197 (capacity 37,000)	2.6 persons per automobile
Cleveland Indians Saturday baseball game – July 1997[15]	43,070 (capacity 43,368)	2.64 persons per automobile
New York Mets weeknight baseball game – June 1997[15]	18,000 (capacity 56,500)	2.31 persons per automobile
San Diego Padres weekday baseball game – April/May 1998[16]	Unknown	2.3 persons per automobile
San Diego Padres weeknight baseball game – April/May 1998[16]	Unknown	2.5 persons per automobile
San Diego Padres weekend evening baseball game – April/May 1998[16]	Unknown	3.0-3.1 persons per automobile
Denver Broncos football games – 1998/2001[19]	76,000	3.0 persons per automobile on-site; 2.3 persons per automobile off-site
Continuous Event		
1997 Stonewall Jackson Heritage Arts & Crafts Jubilee - West Virginia[18]	45,000 to 50,000 (four-day total)	2.46 persons per automobile
1997 West Virginia Honey Festival[18]	6,000 (two-day total)	2.15 persons per automobile
1997 West Virginia Wine & Jazz Festival[18]	3,500 (two-day total)	2.42 persons per automobile
22nd Mountain Heritage Arts & Crafts Festival – West Virginia[18]	25,000 (three-day total)	2.30 persons per automobile

congestion that occurs during event ingress may create queue spillbacks to freeways and major streets, thus impacting background traffic.

Drivers departing an event venue site generally have little or no choice of exit routes. Roadway capacity constraints include freeway entrance ramps and turning movements to arterials and other major collector roadways. Departing traffic queues are usually constrained to the venue access roadway and spillback into the parking areas. Figure 5-7 shows traffic operations, following a football game at Qualcomm Stadium in San Diego, CA, at: (1) a freeway entrance ramp, (2) a venue access road upstream of a freeway, and (3) an on-site venue parking area.

Figure 5-7
Event Patron Departure from a Discrete/Recurring Event at a Permanent Venue

Table 5-15 indicates traffic arrival rates and time of peak arrival for select discrete/recurring events at a permanent venue and continuous events. Time of arrival depends on audience accommodation (e.g., general admission or reserved seating) and/or the nature of pre-event activities. Such activities include tailgating or practices. Figure 5-8 illustrates NASCAR pre-race preparations that attract a significant number of event patrons well before the event start.

As illustrated in Table 5-15, the traffic arrival rate for sporting games and concerts peaks within one hour of the event start. Due to high traffic arrival concentration, practitioners may consider estimating a peak 15-minute traffic arrival rate and associated peak hour factor for roadway capacity analysis. With regard to continuous events, peak traffic arrival rate generally occurs immediately prior to the event start. Since event patrons do not place a high priority on meeting a continuous event start time, the concentration of continuous event arrivals is relatively low compared to other event categories. The peak level of event-generated traffic demand may occur during the middle of a continuous event operating period when both event arrival and departure traffic traverse the roadway system as patrons come and go from the event.

Practitioners may use event patron travel surveys in addition to historical event-generated traffic volume and/or parking occupancy counts to estimate the traffic arrival rate and peak time of occurrence. It should be noted that weather conditions, particularly for continuous events and street use events, may significantly skew data. Thus, practitioners must exercise great care when developing future event estimates from historical data.

Table 5-15
Example Planned Special Event Traffic Arrival Rate Characteristics

EVENT	ATTENDANCE	EVENT START	SITE OPEN	PEAK TRAFFIC FLOW OCCURRENCE
Discrete/Recurring Event at a Permanent Venue				
2001 NASCAR Kansas 400[20]	100,000+	12:00 P.M.	6:00 A.M.	8:00 A.M.
Anaheim Angels weeknight baseball game – July 1997[15]	18,197 (capacity 37,000)	Evening	2+ hours before first pitch	1 hour before first pitch (82% of arrivals – 29% peak 15 minutes)
Cleveland Indians Saturday baseball game – July 1997[15]	43,070 (capacity 43,368)	Afternoon	2+ hours before first pitch	1 hour before first pitch (67% of arrivals – 19% peak 15 minutes)
New York Mets weeknight baseball game – June 1997[15]	18,000 (capacity 56,500)	Evening	2+ hours before first pitch	1 hour before first pitch (62% of arrivals – 16% peak 15 minutes)
Continuous Event				
Louisiana World Exposition in New Orleans – weekday August 1984[21]	35,700	10:00 A.M.	--	31% of event patrons arrived by 11:00 A.M.
Louisiana World Exposition in New Orleans – Saturday in August 1984[21]	Unknown	10:00 A.M.	--	29% of event patrons arrived by 11:00 A.M.

Figure 5-8
Pre-Event Activity

Market Area Analysis

A market area analysis identifies the origin and destination of trips to and from a planned special event. The analysis focuses on developing a regional directional distribution of event patron trips to/from an event site via personal automobile. The site refers to the collective parking areas serving the venue. A regional directional distribution specifies: (1) the freeway and arterial corridors serving the venue site and (2) the percent split and volume of event-generated automobile trips traversing each corridor. Appendix E contains a regional directional distribution prepared for the NASCAR Kansas 400 race.[20]

Table 5-16 summarizes three analysis methods used to define a planned special event market area.

Travel Time and Distance Analysis

Practitioners can apply a travel time analysis or distance analysis to estimate the market area for any planned special event. Continuous events or street use events that do not offer advance ticket sales typically require a market analysis based on travel time or distance and referencing area population distribution.

Figure 5-9 illustrates an example travel time analysis for a downtown Chicago lakefront fireworks display. A geographic information system or other mapping software tool can create travel time zones, as shown in the figure, based on user-defined thresholds. Multiple travel time zones allow users to perform a weighted analysis of population distribution. Practitioners should categorize area population within each travel time zone by zip code or, for a 15 minute threshold or less, by census tract. Most geographic information systems and computer mapping tools generate spreadsheets identifying all spatial population categories within each travel time zone. Using the spreadsheet, practitioners can assign a freeway or arterial corridor, serving the event venue site, to each defined population category. The population distribution among roadway system corridors constitutes the regional directional distribution for the planned special event. Practitioners can also incorporate Census socioeconomic data into an analysis as necessary.

The described travel time analysis methodology applies to a distance analysis as well. Instead of travel time thresholds, users define distance thresholds. Practitioners should exercise care in developing a planned special event market area by travel time or absolute distance to the event venue site:

- In the case of continuous events or street use events, the market area must incorporate only the community or region the event is staged for.

Table 5-16
Market Area Analysis Methods

METHOD	DESCRIPTION
Travel time analysis	• Determine population distribution within travel time threshold of event venue.
Distance analysis	• Determine population distribution within distance radius of event venue.
Origin location analysis	• Determine weighted distribution of known origins by place or zip code.

Figure 5-9
Example Travel Time Analysis

- Discrete/recurring events at a permanent venue, such as professional/major college sporting events or major concerts, warrant an expanded market area.
- A travel time or distance analysis for these events should not reflect a sensitivity to travel time or distance at the city/suburb level. In other words, an event patron located in a city suburb typically does not factor travel time into a decision to attend a professional or major college sporting event at a downtown venue.

Origin Location Analysis

An origin location analysis represents the most accurate method for developing an event-specific regional directional distribution. This analysis utilizes a statistically significant database of event patron travel origins. Input data includes advance or season ticket holder place of residence (e.g., place or zip code) or place of trip origin obtained through a past/similar event travel survey. An event economic impact study also indicates the cities or regions patrons will arrive from. A discrete/recurring event at a permanent venue requires ticket sales, and event organizers initiate ticket sales weeks and even months in advance of the event. But, event organizers or ticket sales companies may consider customer information confidential or proprietary.

An event patron travel survey (see Appendix D) proves effective in determining the exact origin of a patron trip to a planned special event. For instance, weekday events may attract a significant percentage of non-home-based trips as event patrons arrive from work. A survey of patrons attending weeknight baseball games at Pacific Bell Park in San Francisco indicates 28 percent of patrons come from work.[14] An event patron travel survey captures this critical information. Event patron departures from the event venue site typically involve home as a destination.

Practitioners performing an origin location analysis determine a geographical distribution of event patron origins. In turn, this distribution defines the freeway and arterial corridors that event patrons will use to access the event venue site in addition to a traffic distribution. An origin location analysis applies to all planned special events.

Parking Demand Analysis

A parking demand analysis functions to determine the amount of required parking for event patrons in the vicinity of the event venue. A parking occupancy study drives the overall analysis and determination of event parking areas. This study indicates the level of parking spaces occupied, relative to lot capacity, at intermittent time intervals. It also specifies an estimate of peak parking demand, a figure particularly useful for managing continuous events where parking space turnover occurs throughout the event day.

Figure 5-10 presents a parking demand analysis process used to determine the adequacy of event venue (on-site) parking and the identification of appropriate off-site parking areas. The flowchart denotes an analysis conducted for a one-time interval. Practitioners should perform an iterative parking demand analysis, over hourly time periods as necessary, if considering parking areas characterized by high background parking turnover.

Examination of on-site parking areas must account for spaces lost to the event sponsors, bus staging, limousine and taxi staging, media parking, event employee parking, and event participant parking. Net parking supply incorporates event staging needs and any background traffic that can legally use the parking area during event hours of operation. In order to conceptually measure parking supply within a non-striped area, assume 150 cars per acre as a rule of thumb.(22) The travel forecast analysis yields an estimate of parking demand by quantifying the anticipated number of event-generated automobile trips. Aside from continuous events, practitioners should perform a parking demand analysis that accounts for maximum event-generated parking demand.

In evaluating parking supply versus demand, consider as a rule of thumb that 90 to 95 percent lot occupancy represents a full parking area.(23) This especially applies under scenarios where event patrons must self-park. When a parking area reaches a near-capacity occupancy level, drivers experience difficulty locating an empty parking space and must circulate through the lot again or seek another parking area. Continuous events and street use events often utilize self-park areas.

Overflow parking areas comprise both on-street parking and public/private off-street parking areas, located off-site but in the immediate vicinity of the event venue. Figure 5-11 shows a designated off-street parking area, as noted by a light post banner, for the Summerfest music festival in downtown Milwaukee, WI. Identification of off-site parking areas depends on walking distance to the event venue. For example, a 15-minute walking time threshold allows consideration of off-street parking areas within 3,600 feet of an event venue, assuming a pedestrian walking speed of 4 feet per second. Parking areas located further from the venue would require a continuous shuttle service.

Table 5-17 shows a parking occupancy summary for a regional/multi-venue event in downtown Denver, CO. The spreadsheet format conveniently organizes and presents occupancy estimates by time of day and day of week. A parking demand analysis for a regional/multi-venue event presents special challenges. Practitioners must determine the hourly parking requirements for each facility separately. Parking areas in this case function under *shared parking* operation, servicing variable demand rates from different planned special events over the course of a day.

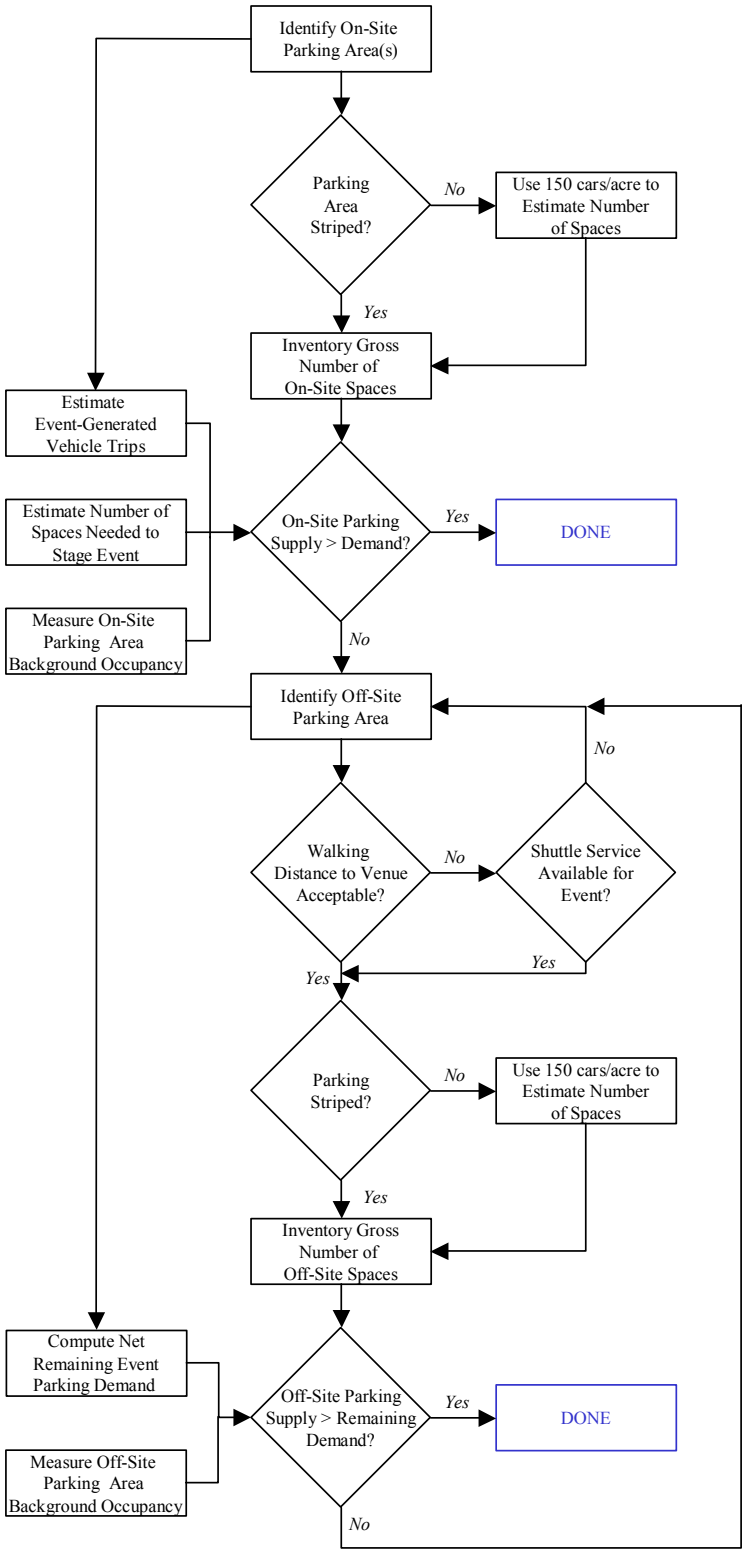

Figure 5-10
Parking Demand Analysis Process

Figure 5-11
Designated Event Off-Site Parking Area

Downtown Parking Summary w/ Coors Field

	Thursday	Friday	Saturday	Sunday
Total Spaces	42,605	42,605	35,380	35,380
Available Spaces	10,651	10,651	30,073	30,073
% Occupancy w/ Event Overflow Parking Downtown and using Coors Field*				
10:00	75%	73%	7%	14%
11:00	80%	79%	17%	41%
12:00	93%	84%	38%	57%
1:00	94%	84%	51%	68%
2:00	94%	84%	55%	83%
3:00	94%	78%	52%	92%
4:00	90%	73%	59%	75%

Events included are Rockies game on Thursday and TOC/GP Fri-Sun

Table 5-17
Example Event Parking Occupancy Summary[23]

Traffic Demand Analysis

A traffic demand analysis determines: (1) a local area directional distribution and (2) the overall assignment of event-generated traffic. This analysis references results obtained through the travel forecast, market area analysis, and parking demand analysis.

The local area directional distribution indicates freeway ramps and intersections, including turning movements, traversed by event-generated traffic arriving to or departing from a planned special event. The regional directional distribution, as determined in the market area analysis, quantifies the percentage of event patron trips (e.g., origins) by regional freeway and arterial corridor, and the planned special event parking areas, as determined in the parking demand analysis, represent *sink nodes* or location of trip destination. Traffic assignment includes event-generated automobile traffic, express buses, charter buses, limousines, and other vehicles transporting event patrons, participants, and event employees. Practitioners performing traffic demand analyses should possess a personal knowledge of the roadway system surrounding an event venue in addition to existing traffic conditions.

A parking demand analysis assesses event parking *sufficiency*. The analysis does not define local traffic patterns to/from individual parking areas. Practitioners, instead, must gauge the utility associated with drivers choosing individual parking areas. The key components comprising this utility include driving time, parking cost, and walking time.[24] The attractiveness of each lot varies by freeway or arterial corridor serving the event site, yet event patrons will accept a moderate increase in overall driving/walking time in exchange for a substantial parking cost savings. The event planning team and traffic management team must recognize such driver behavior and formulate the appropriate traffic flow routes and develop traffic management strategies to manage site access and circulation effectively. Figure 5-12 illustrates one strategy, instituting on-street parking restrictions on the day-of-event. Pre-trip and en-route traveler information also influences driver choice regarding parking selection.

Figure 5-12
Local Area Planned Special Event Parking Restriction

Traffic demand analysis includes developing composite background and event-generated traffic projections for all roadway system facilities serving the event venue. Composite traffic volumes expressed as an hourly (or sub-hourly) rate meet roadway capacity analysis input requirements. These rates identify the peak hour capacity analysis periods during event patron arrival and/or departure. Practitioners must adjust background traffic volumes to account for displaced and diverted traffic due to road closures required to stage the planned special event. These road closures alter traffic patterns to/from commercial trip generators, residential areas, and places of worship. Displaced background traffic assignment involves identifying the shortest path alternate route that has excess capacity.

As a preliminary step to assess the need to perform a detailed roadway capacity analysis, draw a circular screen line (e.g., 0.5 to 1 mile radius) around the event venue site. Note each roadway segment intercepted by the screen line, and estimate the segment's capacity in each direction of travel. Create a chart of hourly composite traffic volumes for each identified segment, and assess capacity deficiencies in both directions of travel. Figure 5-13 shows a preliminary road segment capacity analysis conducted as part of a feasibility study for a regional/multi-venue event in Denver, CO.

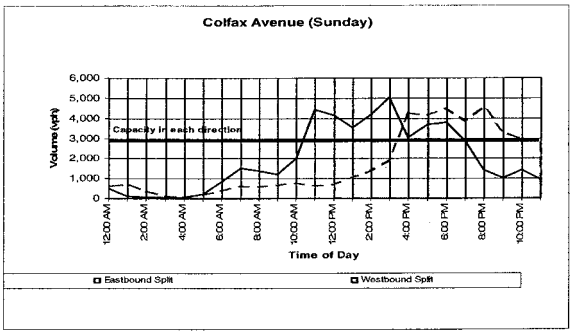

Figure 5-13
Example Preliminary Road Segment Capacity Analysis[23]

Roadway Capacity Analysis

A roadway capacity analysis uses traffic demand analysis results to measure the impact of a proposed planned special event on roadway system operations. At the feasibility study level, a roadway capacity analysis references existing roadway facility operations and capacity (e.g., no reverse flow operation or other capacity enhancements). The analysis assumes pedestrian access management strategies will minimize pedestrian/vehicular conflicts, and parking area access points provide sufficient service flow rates through proper design. Regardless of capacity analysis outcome, pedestrian accommodation and parking management represent key considerations in a planned special event traffic management plan.

Roadway capacity analysis involves freeway segments, freeway junctions such as ramps and weaving areas, street segments, signalized intersections, and unsignalized intersections. To evaluate these facilities, practitioners can employ one of two approaches: (1) analyze section and point capacity or (2) analyze network operations.

- The first approach pertains to applying Highway Capacity Manual (HCM) recommended capacity analysis methodologies to discrete locations in the study area. Practitioners determine roadway sections, freeway junctions, or intersections for analysis, then apply an appropriate HCM methodology to identify movement capacity constraints and measure operations level of service.
- The latter approach concerns utilizing a computer traffic simulation model to identify bottleneck locations, or *hot spots*, and associated saturation flow rates. Practitioners scope the size and detail of the simulation model network, and the model works to reveal operational deficiencies.

Computer traffic simulation models provide seamless analysis of traffic operations across a network of roadway segments and intersections. This proves particularly useful in analyzing a corridor of closely spaced traffic signals where signal coordination and vehicle spillback from adjacent intersections sharply impact traffic operations. Numerous macroscopic and microscopic simulation models exist, including the CORSIM microscopic computer traffic simulation model developed and supported by FHWA. CORSIM can interface component freeway (FRESIM) and arterial (NETSIM) simulation models. For example, it has the capability of showing a freeway entrance ramp bottleneck and the resulting queue spillback on adjacent streets (or vice versa). As shown in Figure 5-14, CORSIM also affords practitioners and event planning team stakeholders the opportunity to view an animation of simulated traffic operations.

Figure 5-14
CORSIM Simulation Animation

Mitigation of Impacts

Mitigating anticipated planned special event impacts on travel represents the ultimate goal of conducting a feasibility study. The mitigation of congestion and potential safety impacts identified through a feasibility study requires development of a traffic management plan and complementing travel demand management strategies. In turn, practitioners can utilize the tools and techniques used to determine feasibility study results in order to evaluate various mitigation strategies and determine if the selected strategies adequately mitigate identified transportation system deficiencies.

Table 5-18 lists numerous tools for mitigating planned special event impacts on local roadway and regional transportation system operations. In meeting the overall travel management goal of *achieving efficiency*, these tools target utilizing the excess capacity of the roadway system, parking facilities, and transit. Through travel demand management, event planning team stakeholders develop attractive incentives and use innovative communication mechanisms to influence event patron decision-making and, ultimately, traffic demand. Chapters 6 and 7

Table 5-18
Tools for Mitigating Planned Special Event Impacts on Transportation System Operations

CATEGORY	EXAMPLE TOOLS
Traffic Control and Capacity Improvements	
Freeway traffic control	• Ramp closures or additional capacity • Alternate routes • Ramp metering
Street traffic control	• Lane control • Alternative lane operations • Road closures • On-street parking restrictions • Trailblazer signing • Parking management systems
Intersection traffic control	• Access and turn restrictions • Advance signing to improve traffic circulation • Traffic signal timing and coordination
Traffic incident management	• Service patrols • Tow truck staging • Advance congestion warning signs • Portable lighting
Traffic Management	
Traffic surveillance	• Closed-circuit television systems • Field observation • Aerial observation • Media reports • Portable traffic management systems
En-route traveler information	• Changeable message signs • Highway advisory radio • Media • Static signing • Destination signing
Travel Demand Management	
Transit incentives	• Public transit service expansion • Express bus service from park and ride lots • Charter bus service
High occupancy vehicle incentives	• Preferred parking • Reduced parking cost
Event patron incentives	• Pre-event and post-event activities
Bicyclist accommodation	• Bicycle routes and available parking/lock-up
Local travel demand management	• Background traffic diversion • Truck diversion
Pre-trip traveler information	• Internet • Telephone information systems • Public information campaign • Event and venue transportation guide • Media

detail impact mitigation strategies and tactics.

EXTERNAL FACTORS AFFECTING SCOPE OF EVENT IMPACT 

Overview

This chapter summarizes event operations planning and impact analysis activities that address the core factors affecting planned special event severity. That is, *travel demand*, *road/site capacity*, and *event operation*. A number of secondary factors warrant consideration in the event operations phase, including:

- Available resources
- Weather
- Concurrent roadway construction
- Concurrent planned special events

These factors can greatly influence the level of impact a planned special event has on transportation system operations. By gaining an understanding of the special challenges that these external factors present, the event planning team can develop appropriate contingency response plans, using the tools and strategies presented in Chapters 6 and 7, to mitigate infrequent but high-impact scenarios.

An assessment of the level of impact that an external factor has on travel during a particular planned special event involves the consideration of the following components:

- Duration – temporal impact (e.g., when does the external factor impact operations and for how long?).
- Extent – spatial impact or scope of area affected (e.g., does the external factor impact a particular corridor or the entire region?)
- Intensity – volume of impact (e.g., how severe is the impact?)

Practitioners should express the impact of an external factor in terms of how it affects travel demand, road/site capacity, and personnel/equipment resource quantities. Feasibility study input data can reflect adjustments made due to certain anticipated external factors, or practitioners can rerun parking and roadway capacity analyses to account for a new unexpected factor (e.g., occurrence of emergency road construction). In turn, revised results may warrant adjustments to the event traffic management plan.

Available Resources

Available resources refer to the quantity and experience of personnel and equipment available to plan and conduct day-of-event travel management operations. Besides the size of a planned special event, the level of required resources depend on time/place of occurrence, other planned special events, and equipment status.

A special factor that may place significant strain on available resources involves the occurrence of planned special events at a venue under reconstruction. Shown in Figure 5-15, venue reconstruction places additional demand on the amount of traffic management team personnel and equipment resources needed to manage events hosted by the venue during its reconstruction. Stakeholder response to on-site parking restrictions include redevelopment of traffic management plans to accommodate parking demand, pedestrian access, and traffic flow in the immediate vicinity of the venue.

Figure 5-15
Stadium Reconstruction

Figure 5-16 presents a site and pedestrian accommodation plan for 2002 Green Bay Packers games during Lambeau Field renovation. Appendix F contains contingency parking and pedestrian accommodation plans for event patrons traveling to Lambeau Field.

Weather

Weather conditions affect travel demand, road/site capacity, or both. For example, in winter, snow banks in permanent venue parking areas reduce the number of on-site parking spaces required for an event sell-out. Rain can create significant problems for unpaved parking areas and access roads. A one-day rain event totaling approximately 0.70 inches during the 2002 U.S. Golf Open forced the traffic management team to close all unpaved parking areas adjacent to the golf course. Figure 5-17 displays a traffic advisory service television announcement issued to indicate contingency parking arrangements that used paved lots.

With regard to travel demand, weather conditions have a significant impact on attendance (e.g., increased attendance or reduced attendance) and/or the rate of arrivals and departures at some special events. For instance, event patrons will attend an event at a domed stadium on a rainy day, but patrons will bypass arriving at the venue early to tailgate, thus concentrating patron arrivals.

Concurrent Road Construction and Planned Special Events

The occurrence of planned events, including road construction and other planned special events, create a range of impacts affecting different traffic management plan components. On a regional level, the characteristics (e.g., increased traffic demand, road/lane closures) of concurrent planned events reduce available capacity in roadway corridors serving a particular planned special event, thus affecting traffic flow patterns. Local impacts include reduced parking supply, in the event of other area planned special events, and restricted traffic circulation.

The identification of concurrent planned events requires interagency communication at the local, county, and state level. Figure 5-18 illustrates an example of a local department of public works (DPW) inventory, accessible through the DPW website, of active local road construction and other planned special events within the jurisdiction.

Key considerations include:

- With regard to planning for a specific planned special event, the event planning team should identify road construction activities in all jurisdictions within a certain travel time or distance radius, equivalent to the event market area, of the event venue. Appendix G contains a local stakeholder outreach letter pre pared by the Wisconsin DOT to identify local road construction in the vicinity of Miller Park and scheduled during the 2002 All-Star baseball game.

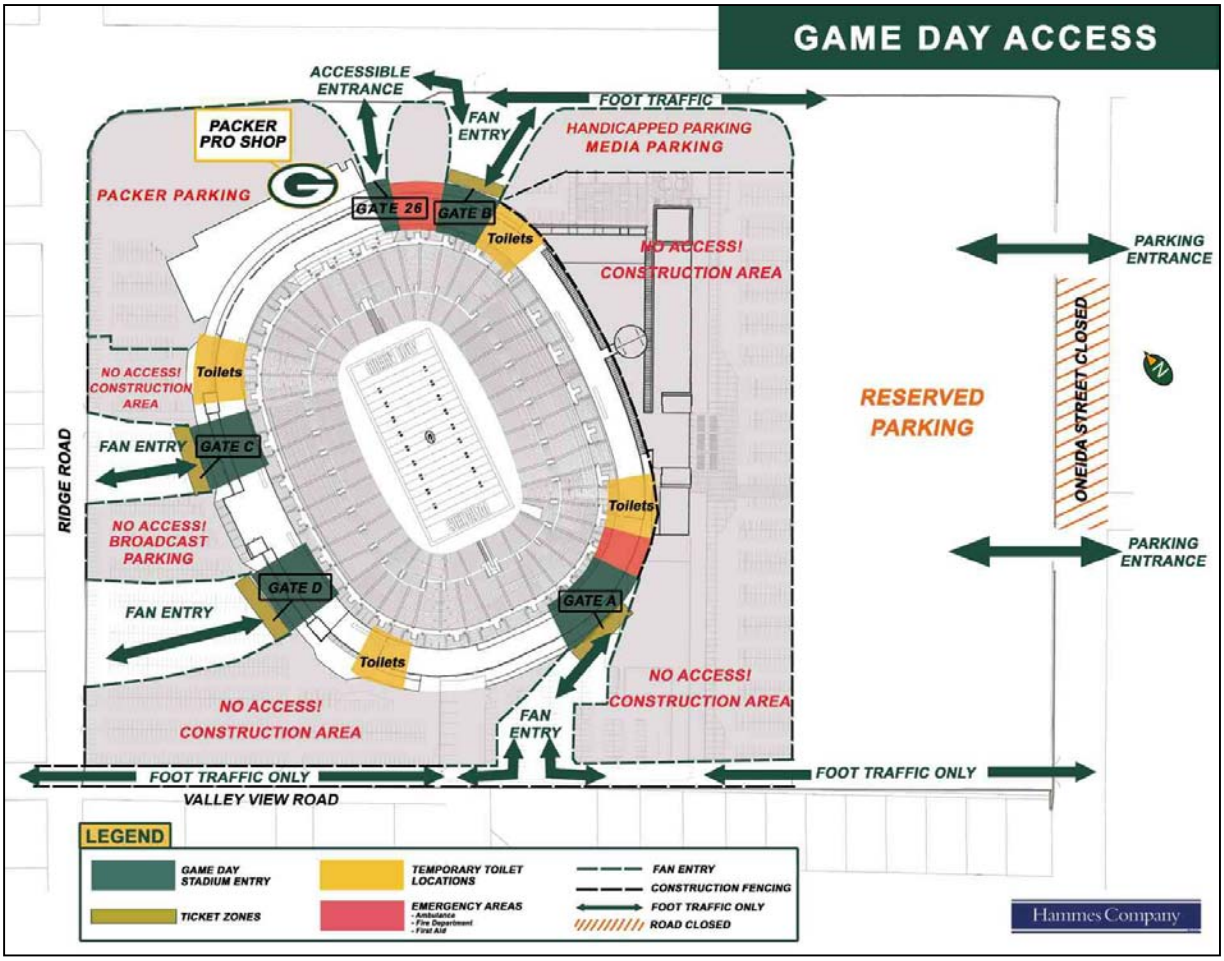

Figure 5-16
Site and Pedestrian Accommodation Plan for Stadium Reconstruction

Figure 5-17
Contingency Parking Plan for Weather

- The event planning team must also interact with area venue operators and determine a timeline of planned special events in the region, particularly those affecting the transportation system serving the subject planned special event.
- Recognizing the regional impacts (e.g., county and multi-county) of major planned special events, the event planning team should obtain information, including attendance estimates, on planned special events occurring in other metropolitan areas and areas with large venues within a certain radius (e.g., 50 or 100 miles). Highway corridors traversing one jurisdiction can realize a significant

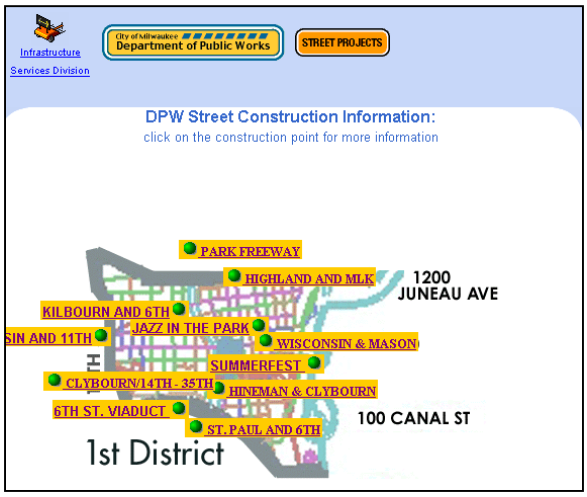

Figure 5-18
Internet Summary of Road Construction and Planned Special Events *(Graphic courtesy of the City of Milwaukee DPW.)*

increase in background traffic during typical off-peak periods as a result of traffic generated by major events occurring in other jurisdictions.

External Factor Monitoring and Assessment

The event planning team should maintain, and continually update, a spreadsheet matrix or map of inter-jurisdictional roadway construction and planned special events occurring over some defined period of time. For example, Appendix G contains a Wisconsin DOT summary of local and state road construction coupled with major planned special events occurring in the Milwaukee metropolitan area over Summer 2002. Identification of concurrent planned events allows stakeholders to merge transportation planning and operations efforts and consider revising road construction schedules.

On a broader scale, a regional committee on planned special events monitors planned events across a metropolitan area through regular meetings with traffic operations agencies, law enforcement, community officials, event organizers, and other agencies. The committee facilitates communication and coordination between specific event planning and operation task forces to ensure optimal application of personnel and equipment resources. The Traffic Incident Management Enhancement (TIME) program in southeastern Wisconsin maintains such a committee. As highlighted in Chapter 2, the TIME special event committee proposed development of a traffic management planning tool designed to evaluate the severity level of any planned special event proposed in the greater Milwaukee metropolitan area. Table 5-19 lists specific external factors, and associated criteria, accounted for in the draft planning tool.

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Table 5-19
External Factors Considered in the Wisconsin TIME Program
Special Event Planning Tool[25]

QUESTION	INCREASING EVENT IMPACT → CRITERIA				
What is the effect of construction on traffic?					
Is there a construction project on any of the corridors leading to or away from the special event venue?	Not applicable	Some impact	Moderate impact	Considerable impact	Severe impact
Are there any lane closures?					
What effect does the event scheduling have on traffic?					
Is the event scheduled to begin or end during a peak period?	Not applicable	Some impact	Moderate impact	Considerable impact	Severe impact
Is there more than one event beginning or ending at the same time?					
What are the weather conditions?					
Is there a forecast for severe weather before, during, or after the special event that might affect traffic?	Clear	Mild	Moderate	Severe-summer	Severe-winter
Are all human resources available?					
Is the event scheduled to begin and end during normal working hours?	Yes	Most	Some	Few	None
Are key individuals available if needed?					
Is all equipment available?					
Are all facilities available?	Yes	Most	Some	Little	None
Is communication equipment working?					
Is all traffic control equipment available?					

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CHAPTER SIX
TRAFFIC MANAGEMENT PLAN

Figure 6-1
Temporary Reversible Lane Operation

PURPOSE

This chapter details the components of the traffic management plan, which represents the main product of the event operations planning phase. A traffic management plan indicates *how* traffic, parking, and pedestrian operations will be managed on the day-of-event. The plan contains strategies and tactics for mitigating travel impacts identified in a planned special event feasibility study analysis (Chapter 5). It also accommodates travel demand management initiatives aimed at improving transportation system operations on the day-of-event.

This chapter provides data, guidelines, procedures, and checklists, supported by numerous example applications, to assist practitioners in developing a traffic management plan. A comprehensive plan consists of a *site access and parking plan*, *pedestrian access plan*, *traffic flow plan*, *traffic control plan*, *en-route traveler information plan*, *traffic surveillance plan*, and *traffic incident management and safety plan*. Sections on *plan components* and *analysis and modeling* further guide practitioners by presenting a fundamental background on traffic management plan development and evaluation. The organization of this chapter allows practitioners to conveniently extract information on developing a particular traffic management plan component. At the same time, this chapter guides the user in integrating the components into an overall plan.

INTRODUCTION 

After identifying traffic operations deficiencies in the planned special event feasibility study, the next step for the event planning team is to develop a traffic management plan that details traffic, parking, and pedestrian management techniques to mitigate any and all anticipated problems on the day-of-event. The challenge to stakeholders involves not only developing a strategy to mitigate a potential congestion or safety *hot spot*, but also ensuring each tactic does not defeat the objectives of another.

A breakdown (e.g., pedestrian flow) occurring at the venue, parking areas, site access roads, transit system, local street system, or regional corridors serving the event can yield a potential snowball effect on other integrated components of the transportation system. A proactive traffic management plan for planned special events prohibits individual transportation system components from impeding one another. It represents a flexible plan that can adapt to and optimize proposed transit service changes and travel demand management initiatives.

The scope of a traffic management plan varies for each planned special event, even for events happening in the same jurisdiction or region. Different strategies and tactics are successful in handling different categories of planned special events occurring in metropolitan, urban, and rural areas. A successful traffic management plan satisfies both the: (1) customer requirements of all transportation system users and (2) allotted budget for personnel and equipment resources assigned to the day-of-event operation. From a program planning perspective, the deployment of automated systems at a particular venue improves travel management for all future planned special events at the venue. Similarly, a portable system obtained for use during a particular planned special event may be used by practitioners to manage future planned special events in a region.

PLAN COMPONENTS 

Overview

Managing travel for planned special events involves developing a transportation management plan that contains operations and service strategies specific to managing traffic, transit, and travel demand. A transportation management plan consists of three key components:

- Traffic management plan
- Transit plan
- Travel demand management initiatives

A transportation management plan represents an extension of the feasibility study, referencing study input data and analysis conclusions, then expanding the analysis to include mitigation strategies and tactics. These strategies create a physical change in travel pattern flow, and tactics describe available tools or management approaches to meet the associated strategy.

The feasibility study results influence the scope of the transit plan and other travel demand management initiatives by identifying traffic capacity deficiencies and community (e.g., residential and commercial business) impacts. Transit agencies may work off-line to develop a transit plan detailing schedules and necessary equipment and personnel resources. The transit plan may specify one of more categories of transit operation that include:

- Existing service plus additional vehicle hours (e.g., more frequent service or expanded hours of operation)
- Existing service plus route deviation (e.g., includes new stop at transit station(s) near venue)

- Express service (e.g., new route and schedule)
- Charter service (e.g., contract service)

Numerous factors affect the category and extent of service provided. Public transit agencies must consider service boundaries and Federal Transit Administration regulations, particularly with regard to charter service. Profitability and resource availability, particularly if the planned special event occurs during a commute or high-recreational traffic period, governs decision-making as well. A traffic management plan incorporates the transit plan by accommodating proposed services and/or mitigating service deficiencies. It also promotes special travel demand management strategies, such as designating parking in preferred locations for high occupancy vehicles only.

A traffic management plan includes operations strategies for managing event-generated and background traffic within the local and regional area impacted. The plan also specifies techniques to facilitate site access, parking, and pedestrian access. Table 6-1 lists objectives of a planned special event traffic management plan. Pedestrian accommodation involves handling pedestrians arriving to a planned special event venue via all available modes of travel. To ensure the dissemination of credible traveler information, the event planning team should include media representatives and partnerships developed if necessary. The traffic management plan should include mechanisms for dissemination of accurate and up-to-date information. The plan should state expected transportation conditions, categorized by mode of travel (e.g., expected travel time by car, transit, express/charter service, etc.), with congestion mitigation measures. Safety provisions include prevention of secondary traffic incidents, reduced driver confusion, and reduced vehicular and pedestrian conflicts.

Table 6-1
Traffic Management Plan Objectives

OBJECTIVE
• Facilitate safe and quick travel to/from the event site for spectators and participants.
• Utilize excess transportation system capacity.
• Maximize efficiency of parking operations and internal circulation.
• Accommodate pedestrians.
• Automate traffic control tasks.
• Disseminate useful and credible traveler information.
• Maximize safety.
• Minimize impact on affected residents and businesses.

As shown in Table 6-2, the key components of a traffic management plan for planned special events include:

- Site access and parking plan
- Pedestrian access plan
- Traffic flow plan
- Traffic control plan
- En-route traveler information plan
- Traffic surveillance plan
- Traffic incident management and safety plan

Not all plan components represent a distinct formal plan but warrant consideration, either individually or in concert with another component. For instance, a traffic incident management (TIM) plan may reference an existing TIM manual for a region but include new operations details (e.g., freeway service patrol routes and quick clearance strategies) specific to the planned special event.

The event planning team in-charge of developing the traffic management plan also should consider the number and operating characteristics of traffic management team command centers to be used on the day-of-event. Figure 6-2 shows three command center arrangements for traffic management team operations on the day-of-event. Stake-

Table 6-2
Traffic Management Plan Components

COMPONENT	CONSIDERATION	COMPONENT	CONSIDERATION

Site Access and Parking Plan	• Lot assignment
	• Vehicle access and circulation
	  o Parking area ingress
	  o Pick-ups and drop-offs
	  o Parking area egress
	• Parking area design and operation
	  o Process component
	  o Park component
	• Parking occupancy monitoring
	• Parking regulations
	• Traveler information
		Pedestrian Access Plan	• Pedestrian control
			  o Pedestrian routing
			  o Pedestrian crossing
			• Disabled accessibility
			• Shuttle bus service
			  o Service design
			  o Station design
			  o Management
			  o Cost

Traffic Flow Plan	• Route planning
	  o Corridor traffic flow route
	  o Local traffic flow route
	• Alternate routes
	• Emergency access routes
	• Background traffic accommodation
	• Transit accommodation
		Traffic Control Plan	• Freeway traffic control
			  o Traveler information
			  o Interchange operations
			• Street traffic control
			  o Alternative lane operations
			  o Route marker signing
			  o Monitoring
			• Intersection traffic control
			  o Turning movement lane balance
			  o Traffic signal operations

En-route Traveler Information Plan	• Static signing • Changeable message signs • Highway advisory radio • Media • Other technology applications	Traffic Surveillance Plan	• Closed-circuit television systems • Field observation • Aerial observation • Media reports

Traffic Incident Management and Safety Plan	• Crash prevention
	  o Signing
	  o Public information safety campaign
	• Service patrols
	• Traffic incident quick clearance initiatives		

holders may utilize one to all command center types during the day-of-event. The tactical approach presented in the traffic management plan depends on what command centers are planned. A transportation management center (TMC) allows for the automation of several traffic surveillance and control tasks. Agencies dispatching a mobile command post on the day-of-event may take responsibility of developing a traffic management plan for the road system segment within their jurisdiction. In turn, the agency: (1) coordinates critical elements of the plan (e.g., freeway to street connections) with other pertinent stakeholders during event planning team meetings, (2) formally distributes the plan during the implementation activities phase, and (3) staffs a supervisor at an interagency command post on the day-of-event. Therefore, for a single planned special event, the traffic management plan may include one plan developed by an interagency event planning team or a series of plans specific to each affected

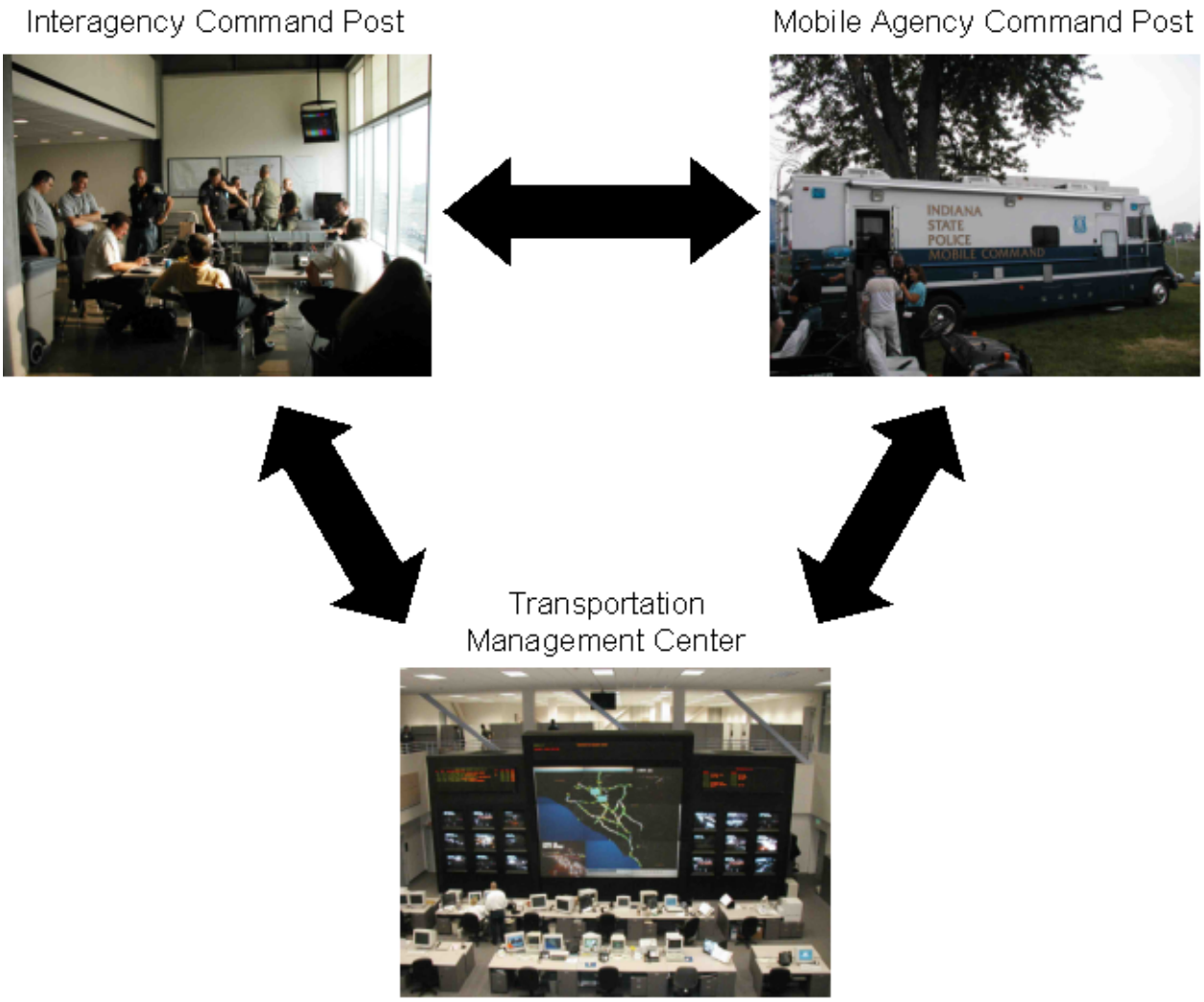

Figure 6-2
Traffic Management Team Command Centers on the Day-of-Event

jurisdiction or each transportation system component (e.g., freeways, streets and intersections, and venue site).

Development Process and Integration

The following principles steer the traffic management plan development process: (1) provide a satisfactory level of service to all transportation system users, and (2) achieve balanced transportation system operations. Figure 6-3 illustrates the fundamental relationships in transportation system operations that drive the consideration and evaluation of mitigation measures throughout this process. Characteristics of demand include volume, route of travel, and mode of travel. Transportation system characteristics include:

- Existing infrastructure (e.g., number of travel lanes, parallel roadways, etc.)
- Operational policies and regulations (e.g., scheduled transit service, traffic signal control, etc.)
- Monetary costs (e.g., parking fees, tolls, etc.)

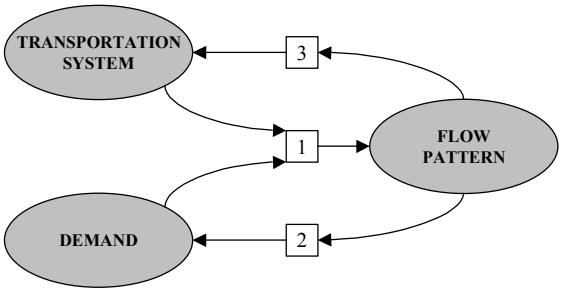

Figure 6-3
Fundamental Relationships in
Transportation System Operations

In Chapter 5, the feasibility study evaluated the flow pattern created by the transportation system and demand (relationship #1). The traffic management plan development process begins with an assessment of this flow pattern. First, practitioners should recognize that flow pattern influences travel choice and, therefore, demand (relationship #2) as long as other attractive (e.g., higher utility) travel alternatives exist. For instance, a feasibility study may identify a roadway capacity deficiency, but an effective traveler information plan can alleviate the deficiency by informing transportation system users of other, underutilized travel alternatives (e.g., alternate routes or modes). This effort achieves balanced transportation system operations by equalizing the utility of all available travel choices and may succeed in providing a satisfactory level of service for all system users.

Flow pattern also influences the transportation system (relationship #3), causing planners to implement capacity improvements or changes in transportation system operations. Simple changes include establishing temporary regulations or revising monetary charges (recouped from event organizers) to influence travel choice utility. Other infrastructure and operations mitigation measures required to manage travel for a planned special event are developed by the event planning team and specified in the traffic management plan. Such measures, when analyzed or implemented, cause a flow pattern change.

The most cost-effective and preferred set of strategies for planned special event travel management utilizes the existing transportation system infrastructure and services. This represents the recommended initial focus of the event planning team; Achieve balanced transportation system operations, then evaluate system level of service.

Planned Special Event Activity Networks

Figure 6-4 outlines the various activity networks that may serve a planned special event venue. Each activity network describes the inter-modal movements and transfer points from origin to venue destination. Integration of the traffic management plan components involves meeting the service requirements of these activity networks. For example:

- A pedestrian access plan must accommodate pedestrian trips connecting various modes of travel.
- A courtesy shuttle bus operation may service both public transit stations and satellite parking areas within the venue site area.
- Traveler information plans must account for all activity networks.
- Impacts to non-attendee transportation system users occur on the regional level, and activity network components within the site area level impact local residents and businesses near the venue.

For smaller planned special events, the event planning team may target one activity network, such as improving automobile access to designated parking areas or improving public transit usage. For larger events, the team must coordinate and achieve seamless operation among several activity networks.

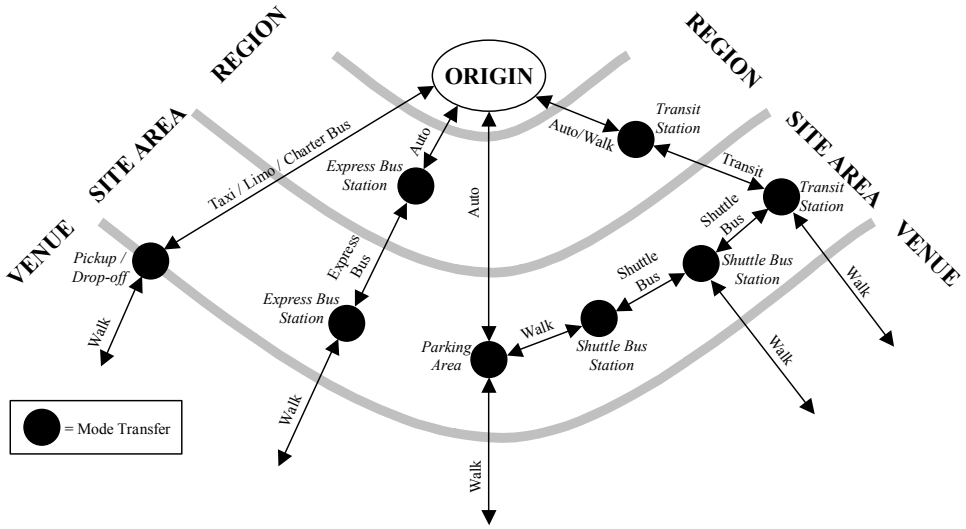

Figure 6-4
Planned Special Event Activity Networks

Special Considerations

The event planning team must create a flexible traffic management plan that accommodates modifications on the day-of-the-event as well as special considerations that surface prior to the planned special event.

Table 6-3 lists the various groups that either attend or have a direct interest in a planned special event. Throughout the traffic management plan development process, the event planning team must regularly monitor and communicate any special considerations that arise in conjunction with the needs of the groups attending the event.

Table 6-3
Groups Attending a Planned Special Event

GROUP
• Participants
• Spectators
• Event sponsor
• Dignitaries
• Media
• Non-ticketed visitors
• Street vendors

Dignitaries

Ensuring the security of dignitaries traveling to and from an event venue requires added traffic control measures and constant surveillance while a motorcade is in motion. This includes the implementation of a rolling roadblock as the motorcade traverses a planned route in addition to the use of aerial surveillance for monitoring motorcade progress and downstream traffic conditions. In fact, the transport of dignitaries represents a planned special event in itself, regardless of travel purpose. Dignitaries may not announce a visit until the last minute, well after the event planning team finalizes the event traffic management plan. Also, non-security personnel, including transportation agency officials, may not receive information on the actual dignitary arrival time or motorcade travel route until a short time before the motorcade commences travel. In turn, the event planning team must maintain special provisions within the traffic management plan, such as alternate road closures based on motorcade route, to allow a motorcade unimpeded access to its destination.

Event Participants

Event participants not only require secure transport, but maintaining their travel itinerary is of critical importance. In particular, regional/multi-venue events may require event participant transport while ingress/egress operations take place at adjacent planned special event venues. Here, stakeholders may elect to outfit vehicles used to transport participants with an Automatic Vehicle Location (AVL) system. The traffic management team can continually monitor the exact location of vehicles transporting participants and other VIPs from a TMC or command post and implement special traffic control (e.g., change traffic signals to a green indication) as needed.

Media

Media often arrives to a planned special event well before spectators and marks one of the last groups to depart the event. However, media crews may conduct broadcasts outside the event venue. Coverage of a street use event involves special accommodations as well. The event planning team should coordinate with media groups on where: (1) media trucks will park, (2) cameras positioned, and (3) cables run.

Street Vendors

Under normal day-to-day traffic operations, *side friction* generally refers to the frequency of parking maneuvers and transit stops occurring in and out of travel lanes. Street vendor activities during planned special events, shown for example in Figure 6-5, impede traffic flow as event patrons slow or stop to conduct transactions (e.g., buy event tickets or merchandise). Motorist safety becomes a concern when street vendors traverse the right-of-way of freeways and arterial roads. Elements of a traffic incident management and safety plan should include tactics for eliminating illegal street vendor activities.

Figure 6-5
Street Vendor Activity

Contingency Planning

Contingency planning represents *event insurance*. While stakeholders may consume additional time and resources during advance planning for a planned special event, the availability of contingency plans helps mitigate a potential systemic breakdown of the transportation system during an unexpected event occurring at or near the same time as the planned special event. Key steps in contingency planning include:

- Develop a traffic management plan that is *scenario-based*. This concept applies to various plan components as well as to pertinent tactics. Each developed plan should include response actions for different unplanned scenarios. Plans and tactics may consider identical and different scenarios. A response action under one plan may warrant implementation of a contingency response described in another plan. For example, heavy rains that force the closure of a parking area triggers traveler information message changes to an alternate planned set.
- Consider and plan for a range of possible unplanned scenarios. Table 6-4 provides a contingency plan checklist for planned

special events. This checklist includes the risk scenarios presented in the previous chapter. An emergency management agency may maintain a separate emergency response plan that, if put into effect, supercedes the traffic management plan. Yet, the emergency management agency and other public safety agencies work as part of the event planning team to ensure adequate emergency access routes, pedestrian access routes, and evacuation destination areas exist to meet emergency management plan requirements.

Table 6-4
Contingency Plan Checklist

CONTINGENCY

• Weather
  ○ Severe weather outbreak
  ○ Flooding on event site access routes
  ○ Flooding in event parking areas
  ○ Parking during wet weather
• Security threat
• Major traffic incident
• Delayed event
• Event cancellation
• Absence of trained personnel and volunteers on the day-of-event
• Equipment breakdown
• Demonstration or protest
• Unruly spectator behavior
• Overcrowding
• Event patron violence

- Determine changes in operation due to unplanned scenarios. Aside from evacuation, the occurrence of a major traffic incident or security threat creates a multi-faceted problem for a traffic management team. This includes potential reallocation of personnel, from field crews to supervisors who must manage the unexpected event, and equipment resources. In addition, intra- and inter-agency radio communications may become deficient in servicing the unplanned event and planned special event if agencies failed to assign a dedicated channel for planned special event only communications.

Consider the level of response to a security threat, involving a suspicious truck stopped on a freeway, that occurred during the 2002 Winter Olympics:[1]

Early in the Games, a semi-trailer truck was stopped on the I-15 freeway, just south of downtown Salt Lake City. Because the truck did not have the legally required markings and other reasons, the Utah Highway Patrol (UHP) considered the situation to be a potential safety threat. Additional law-enforcement resources were summoned to the scene. During the entire time, the staff in transportation management center Room 230 (regional transportation management stakeholders) monitored the situation closely, viewing it with a nearby CCTV camera as well as monitoring radio reports from the UHP officers at the scene. After almost an hour passed without a resolution, staff in Room 125 (senior Utah DOT traffic engineers) began preparing to invoke the contingency plan for closing the freeway in both directions. This Action Set would have diverted all freeway traffic to parallel arterials, with the appropriate traffic management actions (new signal timing on the surface streets, changeable message sign messages on the freeway), plus traveler information actions (issuing a CommuterLink Alert, media bulletin, etc.). Fortunately, it was soon determined that the cargo in the truck was benign and the "issue" was closed in Room 230.

ANALYSIS AND MODELING 

Overview

No planned special event transportation management plan, not even for a repeated

special event, can be prepared and executed without detailed planning and without modifications as the event unfolds. To be successful, the event planning team has to anticipate, and therefore plan for, all the possible scenarios that will challenge the transportation network and the mobility of the plan.

A special event transportation and implementation plan includes elements such as personnel assignments, communications from various sources, communications between multiple agencies, and guidelines for accessing and utilizing remote equipment. All of these elements are used in various manners depending upon the existing conditions, and the plan should be flexible to allow modification throughout the event. In essence, a special event plan is a plan for multiple contingencies and multiple scenarios.

Many tools and techniques are available to analyze and assess the plans. Most are scenario-based and use techniques to simulate the event to ensure that the proper resources and communication protocols are in place and are efficient. These techniques address the many contingencies, and as such, numerous plans are developed prior to the event and implemented during the event, as they are needed.

It is important to note that the assessment and development of plans do not end when the event ends. At the conclusion of the event, stakeholders comprising the event planning team and traffic management team must evaluate the plan in order to improve the plan as well as to utilize the lessons learned in future traffic management applications. Further, this evaluation process is not restricted to post-event, but instead can and should be conducted throughout the event, and modifications to the plan made *on-the-fly*.

Analysis Techniques

Planners historically have used simple planning techniques as well as high-tech computer-assisted techniques to plan and manage for planned special events. These planning techniques take many forms, ranging from traditional incident management processes and traffic engineering processes to computer modeling of scenarios.

Three primary ingredients for successful event management are: (1) proper resources, both human and non-human, (2) a good communications plan (implementation plan), and (3) a firm understanding of the transportation system's capabilities and, more importantly, its limitations. The best and most proven techniques for event operations planning are to model and test the scenarios using any and all contingencies.

Tabletop Exercises

Tabletop exercises bring all of the stakeholders together. During these exercises, scenarios are posed and escalated. These scenarios typically do not require modeled network information, as their primary purpose is to test the stakeholders as to how they would react and to fine tune the responsibilities of each stakeholder and the communications protocol between the stakeholders. Many scenarios that can cause disruptions to the event transportation are played out, and any loopholes in the operations planning are obvious to the participants. This type of exercise is supported by more detailed analyses, usually in the form of computer simulation.

Computer Traffic Simulation

In large-scale event planning, it is beneficial to understand the impact that the event will have on the existing roadway system. Where this network is complex and multiple

alternatives may exist, each will need to be evaluated. The common approach to this function is to apply tools to model the network. Capacity and LOS analyses are useful tools for gauging the expected operating conditions along roadway segments and for determining the "order-of-magnitude" changes that will result from major changes in traffic flow (e.g., as caused by a planned special event) and roadway improvements (e.g., widening, bottleneck improvements). However, improvements provided by transportation management strategies and systems are typically not reflected in such procedures. Moreover, information on performance measures (e.g., vehicle delays, fuel consumption, emissions) is not provided by capacity analysis techniques. It may therefore be worthwhile to utilize computer traffic simulation models, which can examine the manner the roadway network performs under various sets of simulated conditions.

As implied by the name, traffic simulation models examine the manner in which the roadway network performs under various sets of "simulated" conditions. They provide an excellent means of estimating changes in roadway performance metrics (e.g., average speeds, travel time, delays, emissions) resulting from increased traffic, roadway restrictions, traffic management strategies and improvements.

Traffic simulation models can be divided into the following two general classes:

- Macroscopic models are based on deterministic relationships between roadway and intersection characteristics and traffic flow. Examples include TRANSYT-7F, FREQ, and the TRAF suite of models.

- Microscopic models simulate the movement of individual vehicles through the network being modeled. Examples include INTEGRATION, Paramics, Synchro/SimTraffic, and the TSIS suite of models.

Some simulation models are designed for analysis of individual intersections or specific types of facilities, while others are designed for network-level analysis. Models capable of network-level analysis include TRANSYT-7F, Synchro/SimTraffic, INTEGRATION, and Paramics. The TSIS (Traffic Software Integrated System) set of models includes NETSIM for network analysis, FRESIM for freeway analysis, and CORSIM, which is an integrated package of the network and freeway models. The TRAF set of models includes NETFLO for network analysis, FREFLO for freeway analysis, and an integrated package (CORFLO) of the network and freeway models. FREQ simulates corridor traffic operations including one freeway and one parallel arterial.

The individual models vary in their capabilities, limitations, and ease of use (a discussion of which is beyond the scope of this Handbook). A significant amount of effort generally is required to learn to use traffic simulation models, including setting up the appropriate inputs and parameters. A significant amount of effort may also be required to obtain traffic and network data to conduct the analysis and to calibrate the model to local conditions. Data requirements are proportional to the extent of the network being modeled. The required data can include characteristics of each link (e.g., length, number of lanes, auxiliary / HOV lanes, ramps, grade, speed limits, lane widths, pavement condition), link traffic flow information (e.g., entering / exiting volumes, ramp volumes, travel times, percent heavy vehicles and buses, lane changing characteristics) and other types of information such as detector locations, incident characteristics (e.g., effect of lane blockage on capacity), and ramp metering operations.

Simulation models generally require a non-trivial analysis effort. Moreover, any model-specific limitations should be taken into consideration when interpreting the outputs of simulation. Sensitivity analyses are important to developing an understanding of: (1) how reasonable the simulation estimates are and (2) how much confidence the analyst should place in them.

SITE ACCESS AND PARKING PLAN 

Overview

Chapter 5 detailed steps for conducting a parking demand analysis, including guidelines for evaluating the scope of parking area required to serve event patrons. In turn, a site access and parking plan contains operations strategies for managing automobile, bus, taxi, and limousine traffic destined to and from the following areas in the vicinity of a planned special event venue: (1) public parking area, (2) reserved (permit) parking area, (3) overflow parking area, and (4) pick-up/drop-off area. The event planning team must create a flexible plan that contains proactive strategies for responding to real-time event patron travel patterns driven by their choice of public parking areas, especially if parking fees vary from lot to lot. Traffic destined to the three other site areas has a fixed ingress and egress pattern as specified in the plan through lot assignments and permitted movements.

The site access and parking plan must fit seamlessly into other components of the traffic management plan. This includes the pedestrian access plan, traffic flow plan, and traffic control plan. For instance, the pedestrian access plan must accommodate pedestrians arriving to/from each parking area or pick-up/drop-off point while still achieving a manageable dispersion of pedestrian traffic. Parking area access and site circulation arrangements must correlate with street traffic control schemes.

Site access and parking plan development involves a three-step process: (1) access, (2) process, and (3) park:

- Access refers to getting event traffic from the adjacent street system to their destination, such as a parking area or pick-up/drop-off area, during ingress and vice versa during egress. The traffic management team manages the access operations component.
- Process involves activities necessary to "approve" vehicles for entry into a parking area. A fee transaction between a parking area operator and motorist represents a common process activity.
- Park involves handling vehicles from a process point to a parking space. A parking team and associated volunteers operate the process and park components. A breakdown in any one of the three components can result in congestion extending to the adjacent street system and possibly to freeway and arterial corridors serving the planned special event.

Parking Policies and Tactics

General Considerations

Table 6-5 presents three general considerations regarding proactive parking management for planned special events.

Table 6-5
General Parking Management Considerations

CONSIDERATION
• Lot assignment • Traveler information • Contingency plans

Lot Assignment

The objectives of lot assignment include:

- Efficiently distribute the flow of traffic.
- Minimize the superimposition of traffic flow on a single access road section.
- Separate pedestrian, automobile, and bus/taxi/limo traffic.
- Accommodate group needs.

Table 6-6 lists the factors that influence this planning process. Key considerations for some of these factors include:

- Parking areas designated for disabled, reserved, and valet parking require on-site spaces with easy access to the event venue. However, the location of these lots must afford users the opportunity to egress immediately after the event without intersecting extreme levels of pedestrian traffic.
- Some planned special events draw a significant level of event patrons traveling in a recreational vehicle. These patrons typically arrive well before the event start, if not one day prior to the event, and tailgate after the event. As a result, a recreational vehicle parking area should exist adjacent to streets segments that the traffic management team may temporally close after the event to safely accommodate pedestrian traffic. This consideration also applies to the selection of media and participant parking areas. These groups arrive before and depart after the majority of event patrons and require parking near the venue, especially media who have to transport heavy equipment.
- For major special events, employees should park at a remote off-site lot with shuttle bus service.
- The section on site access and circulation will discuss taxi and limo operations.
- In evaluating parking areas for heavy vehicles (e.g., buses and recreational vehicles), the event planning team must verify that vehicles can execute all required turning movements during ingress and egress.
- If the use of any parking area requires a lease or third-party agreement (e.g., use of a commercial lot), then planners must have the agreement signed well before the day-of-event.

Table 6-6
Factors Influencing Lot Assignment

FACTOR
• On-site parking location
• Off-site parking location
• Disabled parking
• Reserved (VIP/permit) parking
• Participant parking
• Valet parking
• Media parking
• Employee parking
• Bus parking
• Recreational vehicle parking
• Taxi/limo staging

Traveler Information

Dissemination of traveler information on site access and parking utilizes several tools and approaches, including pre-trip and en-route:

- As part of pre-trip information dissemination, the event planning team should prepare a site and parking plan for stakeholder use and for distribution to event patrons via advertisements as well as the event or venue website. The event operator should include directions to specific parking areas with pre-event ticket and parking pass distribution.
- En-route information dissemination techniques begin with any combination of static signs, portable changeable message signs (CMS), and highway advisory radio (HAR) positioned on freeway and arterial corridors serving the event. Fig-

ure 6-6 shows a freeway CMS, operated by the Maryland State Highway Administration with real-time sign status posted on the Coordinated Highways Action Response Team (CHART) website, displaying access information for different parking areas.

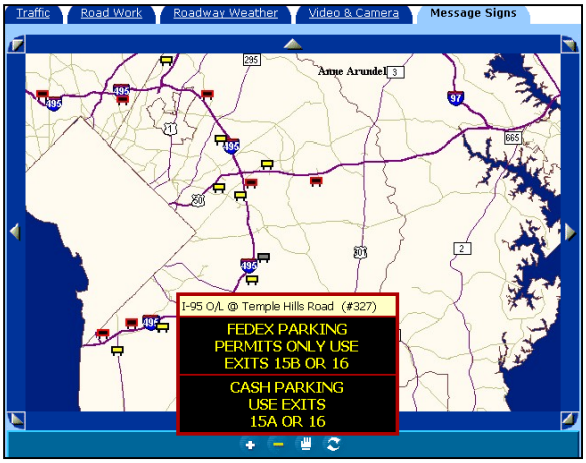

Figure 6-6
Freeway CMS Displaying Parking Information *(Graphic courtesy of the Maryland State Highway Administration.)*

- As part of developing the site access and parking plan, the event planning team should prepare a signing plan and CMS/HAR message sets.
  - Default messages provide directions to assigned parking areas.
  - Stakeholders should maintain alternate message sets to divert traffic away from full lots to overflow parking areas.
  - Implementation of alternate message sets places a premium on interagency communications.
- On the day-of-event, the command post must process real-time information received from parking area operators and observers and, in turn, immediately communicate recommended changes to all agencies managing traveler information devices as the situation dictates.
- The signing plan indicates a network of trailblazer and guide signs from a freeway or arterial access point to various parking areas.
  - Top priority involves guiding event patrons and participants destined to reserved parking areas. Unlike most event patrons who will eventually accept any public parking area, travelers possessing a permit will circulate through the street system adjacent to the event venue until they encounter their designated parking area.
  - Figure 6-7 shows a temporary guide sign for event parking permit holders.

Figure 6-7
Guide Sign for Reserved Parking Areas

- Traveler information considerations during event egress include the provision of parking area identification landmarks, and guide signs to major freeway/arterial routes at parking area exit points and adjacent access roadways.
  - In the absence of parking staff, the guide signs assist motorists unfamiliar with the area in making critical turns to access known freeways and/or arterials when departing the event venue site.
  - Missed turns result in additional circulation through the site area and impacts street network operations during egress.
- Standard parking area identification landmarks at permanent venues include fixing a parking section banner to light posts or naming different levels of a

parking garage. The lack of such permanent identification landmarks at unpaved parking areas can create significant pedestrian/vehicular conflicts, not to mention added delay for the event patron, as pedestrians scan the parking area for their vehicle.

- Figure 6-8 shows an innovative parking area identification technique applied to unpaved parking areas, which represented a golf course, at the Rose Bowl. The technique involved attaching a numbered balloon to portable lighting trailers stationed at various unpaved parking areas. Some balloons were visible from inside the stadium.

Figure 6-8
Temporary Parking Area Identification Landmark

Contingency Plans

Contingency planning involves the development of traveler information message sets to divert and guide event ingress traffic to overflow parking areas:

- If unpaved parking areas are used, the traffic management team should have a contingency plan when wet weather prevents the use of unpaved lots. This includes using other paved areas, particularly lots serving an inactive land use or one adversely affected by wet weather such as a park, and/or allowing on-street parking.

Technology Applications

Technology utilized for day-to-day traffic management can greatly enhance parking management and efficiency of operation at permanent venues that serve numerous planned special events. In particular, use of technology can improve operator monitoring of parking areas and facilitate accurate, up-to-date dissemination of traveler information.

Advanced Parking Management System

A basic advanced parking management system allows operators, stationed at a transportation management center, to monitor parking areas and control traveler information devices used to disseminate parking information. Key considerations include:

- Advanced systems include electronic detection equipment that transmits real-time traffic volume counts and speeds to the TMC.
- The system surveillance and monitoring system incorporates pan-tilt closed-circuit television (CCTV) cameras for viewing parking areas and adjacent access roads.
- Traveler information devices include a CMS and HAR network coupled with strategically positioned blank-out signs that communicate parking area status information (e.g., lot full) to motorists.
- With real-time access to CCTV, TMC traffic signal system operators can implement timing modifications on demand.
- Operators at the TMC can integrate the advanced parking management system into the greater Advanced Traveler Information System for the region (e.g.,

automated information transmission to other agencies, websites, and kiosks).

Advanced Parking Information System

The deployment of advanced parking information systems have successfully occurred at some airports and metropolitan areas across the Nation. This system automatically disseminates accurate, up-to-date information regarding parking facility occupancy status to motorists upstream of the facility, coupled with routing directions to open facilities. From the perspective of planned special events, the system would function well for an event venue served by several parking facilities, such as one located in a downtown area. Electronic signs controlled by the system inform motorists of open parking facilities as soon as they exit the freeway system.

An advanced parking information system generally consists of the following four components: (1) vehicle detectors, (2) a parking control center, (3) information displays, and (4) a telecommunications network. Automated detection methods include inductive loop, ultrasonic, infrared, microwave, and machine vision, although studies have shown infrared detection functions best for advanced parking information systems. The parking control center receives and synthesizes data collected by detectors, and the center transmits messages pertaining to parking facility occupancy to information displays for motorists' use. Operators at the parking control center can override the system during planned special events or unusual circumstances. Information displays include a combination of static and dynamic signs disseminating parking availability information and directions to open facilities. The system can incorporate other traveler information devices, such as HAR, the Internet, telephones, commercial television, and in-vehicle navigation.[2]

The Minnesota DOT, Federal Highway Administration (FHWA), City of Saint Paul Department of Planning and Economic Development, City of Saint Paul Department of Public Works, and one private partner conducted a one-year Saint Paul Advanced Parking Information System Operational Test for planned special events in the area.[3] The stakeholders performed the test in the Civic Center/Rice Park area of downtown Saint Paul, and the test consisted of the following:

- Determination of parking stall occupancy by participating parking operators during planned special events in downtown Saint Paul and instantaneous transmission of available parking to the Saint Paul Traffic Control Center (TCC).
- Instantaneous transmission of information on available parking by the Saint Paul TCC to electronic message signs.
- Wireless, automated parking advisory signs placed at appropriate locations to display the number of stalls available at parking garages or lots with direction arrows to the garages or lots.

Table 6-7 summarizes some key findings yielded by the operational test.

Vehicle Access and Circulation

In order to facilitate safe and quick spectator and participant travel to/from the event site, the site access and parking plan should specify tactics that prevent potential congestion on parking area access roads and allow for good circulation on roadways surrounding the event site. Table 6-8 indicates site access and circulation considerations applicable to the development of a site access and parking plan. The three considerations of: (1) parking area ingress, (2) pick-ups and drop-offs, and (3) parking area egress are discussed in the following subsections.

Table 6-7
Key Findings from Saint Paul Advanced Parking Information System Operational Test[3]

FINDING
• Advanced Parking is perceived beneficial to the participating parking operators and the city of Saint Paul. • Most motorists responding to a mail-back survey thought the system has value. • There were some improvements on the surface transportation system, but the improvements could not be attributed directly to Advanced Parking. • Advanced Parking signs with full matrix displays have sufficient capabilities to support other traffic functions in downtown Saint Paul; Advanced Parking counter signs alone do not have sufficient capabilities. • There were no institutional, legal, or other private sector issues, which had a significant effect on the operational test. • Advanced Parking is transferable to other cities without significant modification.

The reader should review:

- Select street and intersection control tactics (e.g., alternative lane operations, turning movement lane balance, traffic signal operations) described in the "Traffic Control Plan" section of this chapter warrant review for possible mitigation of site circulation deficiencies.
- Traffic flow plan, traffic control plan, and parking area design provisions that impact the scope of mitigation required to provide adequate site access and circulation.

Parking Area Ingress

During event ingress operation, several factors influence the operation of access roads connecting the adjacent street system and parking areas:

- While the physical characteristics of the adjacent street system and associated traffic control may meter traffic flow destined to access roadways, the roads likely do not have sufficient capacity to service incoming traffic. As a result, the event planning team should designate contraflow (e.g., one-way) operation on the access road segment connecting a major feeder intersection and the relevant parking area. An advantage of implementing access road contraflow operation concerns the capability of handling two or more conflicting movements from a feeder intersection with proper channelization. In turn, the design of parking area access points should ensure accommodation of vehicles in all travel lanes.

Table 6-8
Site Access and Circulation Considerations

CONSIDERATION	TACTIC
Parking area ingress	• Right turn circulation pattern • Contraflow operation • Shoulder utilization • Lane channelization • Parking area overflow access points
Pick-ups and drop-offs	• Use of off-street areas • Designation of pick-up/drop-off areas to avoid conflict with primary traffic ingress/egress routes • Storage area
Parking area egress	• Right turn circulation pattern • Preservation of adjacent street flow • Provision of rapid parking area unloading

- Shown in Figure 6-9, shoulder utilization represents another strategy to gain additional access road capacity. As indicated in the figure, the temporary right shoulder lane services through traffic, and the inside lane provides direct access to a parking area.

Figure 6-9
Shoulder Utilization

- Figure 6-10 shows an example of lane channelization implemented on an access road serving venue parking areas. This control technique eliminates unnecessary lane changing, which reduces roadway capacity, in the vicinity of parking area access points. Advance signing can inform motorists on which lane to use.

Figure 6-10
Lane Channelization

- The use of multiple access points to the same parking area provides an opportunity where vehicles traversing the left lane must enter the first access point and vehicles traversing the right lane has access to remaining downstream access points (e.g., left lane becomes exclusive lane to the next downstream access point).
- A breakdown in either parking area process or park operations creates congestion on the access roadway serving the parking area. This is not a "lot full" situation but, instead, a situation characterized by excessive service time to conduct parking fee transactions or to park vehicles. If parking operators do not mitigate the breakdown quickly, congestion on the access road propagates to the adjacent street system. The use of overflow access points and on-call operators/volunteers can effectively limit and even reduce congestion until parking area operations return to normal.

Pick-ups and Drop-offs

Table 6-9 lists guidelines for designating pick-up and drop-off areas. Some considerations include:

Table 6-9
Guidelines for Designating Pick-up and Drop-off Areas

GUIDELINE
• Utilize off-street areas for private vehicles, taxis, limousines, and buses. • Select areas that do not require vehicles to *intersect* heavy traffic flow to/from parking areas or pedestrian access routes. • Designate separate areas for different vehicle classes. • Ensure adequate space exists within the off-street area to accommodate vehicle storage and turnaround.

- A site vehicle circulation rule of thumb involves implementing a right turn pat-

tern of ingress and egress to achieve maximum street system capacity. The quandary with pick-ups and drop-offs concerns accommodating *two-way* vehicle travel, departing traffic during event ingress and arriving traffic during event egress.
    - First, recognize these motorists will encounter resistance only in exiting the immediate site area during ingress and vice versa during egress. They likely will travel in the opposite direction of peak flow on freeway and arterial corridors serving the event venue.
    - Second, vehicles may have to turnaround after a pick-up/drop-off.
- The utilization of off-street parking areas for taxi and limousine event service eliminates taxi/limo cruising at the end of a planned special event. For example, limousine drivers would have to meet their customers after the event and escort them back to the parked limousine. This strategy has proven successful at reducing pedestrian/limousine conflicts at intersections near the Staples Center in Los Angeles, CA.[4]
- For private vehicles, an off-street lot provides a convenient meeting location.
- Pick-up and drop-off area capacity represents another key concern that practitioners must address.
- A queuing system, discussed in the next section on parking area design and operation, can describe the operation of pick-up/drop-off areas for taxis and drop-off areas for private automobiles, limousines, and buses.
- In the case of pick-ups involving private automobiles, limousines, and buses, the event planning team must designate an off-site parking area of sufficient capacity, as determined through a parking demand analysis, to stage vehicles operated by drivers intending to pick-up a specific event patron(s). In an effort to avoid conflict with heavy egress traffic, or as a client courtesy, drivers typically arrive at a designated pick-up area before the end of the event.
- Practitioners can estimate and compare the service rate (vehicles per hour) of all lanes comprising a particular pick-up/drop-off area to the peak arrival rate of traffic using the area. The service flow rate for one lane equals one hour divided by the time to process (i.e., service time) one vehicle picking-up/dropping-off event patrons. If an average pick-up/drop-off service time is two minutes, then the service rate of one lane equals 30 vehicles per hour (60 minutes divided by 2 minutes per vehicle).
    - Personnel assigned to monitor pick-up/drop-off area operation on the day-of-event can enforce a particular service time or length of time a particular vehicle can stay in the pick-up/drop-off area.
- Note that a pick-up/drop-off area queuing system operates stochastically. Traffic arrival rates will vary, and individual service times that collectively determine the service rate will also vary.
- To handle a potential overflow situation at a pick-up/drop-off area, prohibit parking on the access road adjacent to the pick-up/drop-off area, and cone (when necessary) a vehicle stacking lane along the access road shoulder.

Parking Area Egress

Two basic strategies surround parking area egress operations. These contrasting strategies include: (1) preserving adjacent street flow and (2) effecting rapid parking area unloading. Several important considerations include:

- Regardless of strategy, planners should locate parking area access points as far

away as possible from major intersections so that vehicles can exit immediately from the parking areas without disrupting the flow of traffic on the adjacent access road.

- When the adjacent street represents a collector or arterial roadway, the traffic management team generally seeks to preserve flow. This is accomplished either by manual or automated means. A manual operations approach involves traffic management team personnel monitoring parking exit points. Crews permit a maximum volume of traffic to exit the parking areas while still maintaining a smooth traffic flow on the adjacent roadway network. If traffic begins to queue downstream of an exit point, personnel would communicate via radio and movement out of the relevant parking areas stopped until mainline congestion dissipates.
  - This strategy worked successfully during two major rural events, the 1986 and 1995 U.S. Golf Open at Shinnecock Hills Golf Course in Southampton, New York.(5)
  - Instead of manually controlling traffic, traffic management team personnel could operate portable traffic signals placed at parking area access points.
  - If access points have a permanent traffic signal, operators can simply implement new timing plans in favor of either egress strategy.
- To effect rapid parking area unloading, consider providing multiple access points for each parking area.
  - For planning purposes, practitioners may either assume an access point capacity of 900 vehicles per hour per lane (e.g., 4 second headway between vehicles) or use computer traffic simulation software to gain a more precise estimate based on local conditions.
  - An alternate approach involves temporarily striping additional exit lanes, for a nominal distance (e.g., 1000+ feet) plus taper, on the adjacent access road to allow for multiple lanes of traffic out of the parking area. Figure 6-11 illustrates this strategy, implemented for a county fair in rural Dutchess County, New York. This approach works well when the parking area access point is centrally located and accommodates traffic from opposite ends of the parking area.

Figure 6-11
Access Road Traffic Pattern During Event Egress(6)

Parking Area Design and Operation

Parking area operations consist of two distinct components: process and park. A significant breakdown in either component will, in turn, cause congestion to occur and propagate on the access road serving the parking area. The objective of designing and operating parking areas involves providing an access point capacity in excess of the peak rate of traffic flow that traverses the driveway.

Process Component

Any planned special event parking area that requires a fee or permit for access has a service facility in-place to process vehicles entering the lot. Therefore, a first-in-first-out queuing system exists. Figure 6-12 provides a schematic of this system. The queuing system is bounded by the service facility (e.g., parking area gate) and the queue storage area. Figure 6-13 illustrates a queuing system at the entrance of a venue parking area. From a parking area operations perspective, queuing system characteristics include:

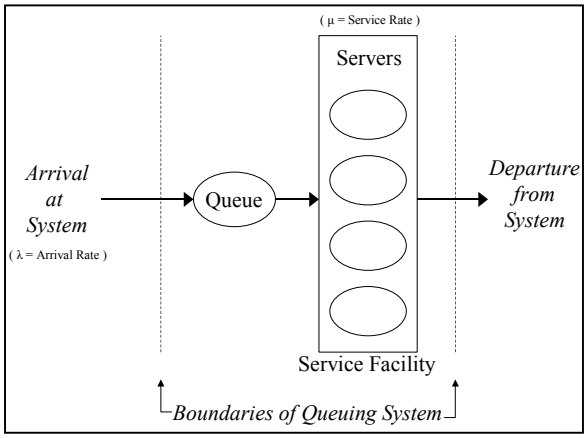

Figure 6-12
Queuing System Schematic

Figure 6-13
Permanent Venue Gate and Queue Storage Lanes

- The arrival rate, λ, denotes the number of vehicles traversing a single parking area access point over some period of time.
- The maximum arrival rate represents the lesser of: (1) access point capacity or (2) adjacent access road capacity.
- The service rate, μ, is the number of vehicles the service facility can process over some period of time. The magnitude of this rate depends on the number of servers (e.g., staff or automated gates) that comprise the service facility and server efficiency.
- Queuing happens when the arrival rate exceeds the service rate. For example, if the maximum arrival rate is 600 vehicles per hour and four parking area gates are open, then each server or staff person must process 150 vehicles per hour, or 1 vehicle in 24 seconds (e.g., the service time), in order to prevent vehicle queues from forming. Motorists will locate open servers, but the event planning team should utilize the queuing system concept, and consider predicted arrival rates, when staffing parking area access points.
- A parking area queuing system operates stochastically. Traffic arrival rates will vary, and individual transaction times that collectively determine the service rate will also vary.
- In designing a service facility for a planned special event parking area, select a conservative server service time (e.g., the time to serve one vehicle) and determine the required number of servers that can process the maximum anticipated arrival rate with one server on break.
- Service time may increase if law enforcement conducts random checks of vehicles entering a parking area.
- To avoid the occurrence of long service times, designate a turnout area adjacent to the gates for vehicles subject to a detailed security check.

Table 6-10 indicates three vehicle processing tactics.

Table 6-10
Vehicle Processing Tactics at Parking Area

TACTIC
• Manual transaction
• Permit display
• Automated transaction

Manual Transaction

Manual transaction refers to cash transactions made between a driver and human server. This tactic involves the longest and most variable service times, as servers have to periodically make change and even answer questions.

Manual transaction operation at parking areas closely resembles the operation of manual (cash) lanes at toll facilities. In both cases, signs inform drivers of the fee in advance of the service facility, and servers conduct cash-only transactions. Numerous publications on toll facility evaluation report the capacity of a manual toll lane ranges from 300 to 400 vehicles per hour. This equates to a service time of between 9 to 12 seconds per vehicle. Practitioners may assume a service time in the stated range, where 12 seconds per vehicle denotes a conservative service time, for individual servers handling cash transactions at a planned special event parking area.

Permit Display

The use of permits for planned special event parking has become increasingly common. Originally, permanent venue or recurring event season ticket holders received or purchased a parking permit as part of their season ticket package. Internet commerce has spurred venues and event organizers to sell reserved parking spaces in advance to event patrons. Typical offers involve obtaining a guaranteed parking space near the venue and main gate.

Advance parking sales provide a two-fold advantage from a parking operations perspective. First, event patrons will have advance information on exactly where to park at the event venue, and repeat customers will become familiar with the fastest route to the parking area. Second, the tactic eliminates cash transactions at reserved parking areas on the day-of-event, substantially reducing service time. In fact, a service facility is unnecessary if parking operators post proper signage and conduct a vehicle check for violators between event ingress and egress.

The operation of a permit-only parking area mirrors that of a free parking area. In determining the capacity of individual access lanes to a free or permit-only parking area, practitioners may assume a 4 second headway between vehicles (or 900 vehicles per hour per lane capacity). This represents the capacity assumption made by officials, during the planning process, for free parking areas used by spectators of the 2002 Winter Olympics.[7] In order to account for roadway geometrics or special turning maneuvers, practitioners can determine the capacity of access lanes using computer traffic simulation software.

Automated Transaction

An automated transaction involves deployment of an electronic fee collection system, suitable for permanent venues hosting numerous events. Similar in operation to an electronic toll collection system, the system would require event patrons to have a transponder in their vehicle. Implementation of a small-scale system could involve distributing transponders to season ticket holders.

Park Component

Parking operators and volunteers must meet the following two requirements for parking vehicles:

- Park vehicles at the same rate as those being processed.
- Minimize pedestrian/vehicular conflicts inside parking areas.

When multiple servers process vehicles, operators should consider creating multiple vehicle streams from the service facility and, in turn, parking vehicles in different sections of the parking area. Each stream must maintain an adequate speed or congestion will occur within the parking area and spillback to the service facility. Prior to the event, parking operators should survey the parking area and note any features that may slow vehicles traversing a parking area. Such features include ditches, sand, and humps.

Figure 6-14 shows an excellent example of minimizing pedestrian/vehicular conflicts inside a parking area. Simply ensure that every vehicle entering a parking area parks as close to the adjacent pedestrian access route, leading to the venue or shuttle bus station, as possible. Erect pedestrian walkway signs and instruct volunteers to tell event patrons where to walk as soon as patrons exit their vehicle.

Figure 6-14
Minimizing Pedestrian/Vehicular Conflicts in Parking Areas

Parking Occupancy Monitoring

On the day-of-event, traffic patterns and parking area loading patterns may vary from event planning team predictions. As a result, some parking areas, particularly non-reserved lots, may load faster than other lots. The event planning team and traffic management team must, in advance of the event, develop a detail for monitoring parking area occupancy levels for the ingress period. The focus of this task involves making a "lot full" decision at a time when all vehicles between the parking area access point and traveler information devices directing motorists to the parking area (e.g., the *pipeline*) can still park at the subject lot. As soon as team personnel make a "lot full" call, TMC or command post operators change the message set communicated by traveler information devices in order to direct motorists to an alternate lot. The traveler information device(s) forming the upstream boundary of the pipeline must be located upstream of the access road serving an alternate parking area. In some cases, a parking area pipeline may extend to a freeway or arterial corridor serving the event venue.

Two methods for making a "lot full" decision in the field include: (1) vehicle count at parking area access points and (2) visual inspection. Both methods require field personnel to have an estimate of the pipeline capacity during load-in. That is, the defined pipeline length (account for multiple travel lanes) divided by average vehicle spacing. Consider that up until the parking area reaches capacity, vehicles traversing the pipeline will be *moving*. Therefore, average vehicle spacing equals vehicle length plus the space allotted by drivers between vehicles. Average vehicle spacing ranges from 30 feet (conservative) to 40 feet.

The vehicle count method involves conducting a manual or machine count at the downstream pipeline end beginning at the start of parking area load-in. This count represents the number of vehicles that have entered the parking lot. The following equation defines a "lot full" decision:

(Capacity of parking area) – (Vehicle count) – (Pipeline capacity) = 0 (Lot full)

The visual inspection method involves the traffic management team or parking operators making a "lot full" decision based on comparing a visual estimate of available parking spaces to the pipeline capacity. The parking area access point(s) must denote the downstream pipeline terminus. Team personnel can obtain an estimate of available parking spaces on the ground, from an overhead vantage point, or from aerial observation. This method is not as precise as the vehicle count method, but the visual inspection method: (1) requires less personnel resources and (2) can be implemented in the latter stages of load-in, as necessary to assess conditions.

Table 6-11 summarizes the parking occupancy monitoring plan used during the 2002 Winter Olympics.

Table 6-11
2002 Winter Olympics Parking Occupancy Monitoring Plan[1]

STEP
• The observers at each lot reported hourly to the TMC command post on the percent of lot capacity in use. • The status of all lots was tracked by the TMC command post. • As any lot approached capacity, a backup lot was identified by the TMC command post. • For each lot and backup lot, the upstream CMS locations were identified. • Diversion messages were posted by the TMC at those CMS locations. • Approaching motorists saw the CMS instructions and diverted to the new lot.

Parking Regulations

Planned special events require law enforcement and other stakeholders to consider various on-street and off-street parking regulations. On-street parking regulations involve day-of-event parking restrictions, as illustrated in Figure 6-15, to: (1) preserve parking for nearby residents and businesses and (2) increase capacity on critical access routes serving the planned special event. Table 6-12 lists some considerations for developing off-street parking regulations.

Figure 6-15
Parking Restriction Signs

Table 6-12
Off-street Parking Regulation Considerations

CONSIDERATION

• Parking area opening and closing time
• Parking on grass adjacent to paved areas
• Parking on islands, medians, and berms
• Parking on the access road shoulder
• Private parking area regulations regarding the obstruction of traffic flow
• Obstruction of pedestrian access routes (e.g., sidewalks)
• Tailgating:
  ○ Occupy one parking space only
  ○ Saving of parking spaces
  ○ Blocking of aisles

Practitioners should assess the use of private land (residential or business) for event patron parking. Owners entice arriving event patrons to use private parking areas by offering a reduced fee relative to event parking areas, or drivers recognize the convenience of the lot location with respect to accessing a freeway or arterial corridor needed to exit the area during egress. Problems may occur particularly during event egress when a continuous stream of traffic exiting a private

lot(s) conflicts with heavy adjacent street traffic attempting to exit the local area surrounding the event site. Congestion on the adjacent street creates congestion that propagates upstream and toward the event site area. Solutions to mitigate the potential impact of private parking areas on adjacent street traffic flow during event ingress and egress include: (1) requiring owners of private land to obtain a permit to offer parking for a fee during a planned special event and (2) staffing traffic control officers at private driveways during egress to meter traffic flow out of the private parking area.

Three keys to successfully implementing a parking regulation include enforcement, advertising, and signing. Enforcement involves both ticketing and towing. Tow trucks assigned to the planned special event venue site can facilitate immediate removal of illegally parked vehicles. Prior to the event, the event planning team could designate an on-site area to serve as a repository for towed vehicles. Event patrons could access the area on foot and then would have to pay a towing charge to retrieve their vehicle.

The event planning team should inform affected local residents and businesses of parking restrictions via direct contact or mailing. To better meet community needs, stakeholders can setup a telephone hotline during the planned special event to field any complaints. This tactic assists law enforcement in identifying areas requiring greater enforcement. For multi-day events, law enforcement can base second-day enforcement patrols on first-day public comments.

Plan Specifications

The event planning team should design a site and parking plan to service both the traffic management team and event patrons. Pre-trip traveler information dissemination (via media, websites, mailings, brochures) should include elements of the site and parking plan. Table 6-13 contains a site and parking plan development checklist. Appendix H contains example site and parking maps prepared for permanent venues.

Event patrons primarily focus on information specifying time of operation, location, and cost. These elements define the utility associated with choosing a particular parking area or electing to drive to the event site altogether. As shown in Figure 6-16, the distribution of an annotated aerial map benefits event patrons unfamiliar with the immediate venue area. Figure 6-17 shows a downtown arena parking map that displays parking fees for various off-site parking areas within sufficient walking distance from the venue. Table 6-14 lists considerations for posting any planned special event plan on an Internet website.

PEDESTRIAN ACCESS PLAN

Overview

A pedestrian access plan provides for the safe and efficient movement of pedestrians within the immediate area of the venue. This includes accommodating pedestrian trips to/from several mode transfer points in a planned special event activity network. These points, shown for example in Figure 6-18, include site parking areas, transit stations, express/charter bus stations, shuttle bus stations, and pick-up/drop-off areas. Moreover, some event patrons may make their entire trip, originating from home or work, on foot. In meeting the managing travel for planned special events goal of *ensuring safety*, the event planning team must develop a plan that: (1) accommodates pedestrians accessing an event via a network of safe walking routes and (2) minimizes pedestrian/vehicular conflicts.

Table 6-13
Site and Parking Plan Checklist

ELEMENT	PROVISION
Event patron parking areas	• Highlight free, pay (state rates), and reserved (permit) parking areas. • Indicate lots where tailgating is permitted. • Show specific parking area access points and state restrictions. • Indicate number of entrance/exit lanes (or servers) at each access point. • Designate lots by a number or letter and provide lot-specific directions. • State time parking areas open, particularly if time varies by parking area. • Discuss features of each parking area (e.g., paved, staffed, lighting, security). • State estimated walking time from each parking area. • Indicate connecting pedestrian access routes. • Show overflow parking areas, state distance from venue, and indicate criteria for operation (e.g., sell-out). • Indicate parking areas for motorcycles. • Indicate parking areas for recreational vehicles (e.g., overnight parking). • Furnish map of available off-site parking areas. o Include information on street regulations (e.g., one- or two-way) and connections to freeways and major arterials. o State on-street parking restrictions. o Specify private parking area regulations (e.g., egress control). o Indicate location of entrance/exit points to off-street parking areas. o Include rates if available. o Show restricted off-site parking areas (e.g., residential neighborhoods, etc.)
Gate access information	• Indicate gate names as shown on event patron tickets.
VIP information	• Show VIP (e.g., official guest / sponsor) parking areas. • Show credential pick-up location. • Show hospitality areas.
Shuttle bus route and stations	• Display shuttle route and all stations. • State cost, and emphasize free services.
Drop-off / pick-up sites	• Show access points and circulation lanes for transit/taxi/limo/shuttle service. • Show exclusive bus lanes. • Show transit / express bus stations. • Indicate general drop-off / pick-up sites where turnaround is permitted. • Indicate valet parking drop-off. • Show disabled drop-off / pick-up site.
Other parking areas	• Show express/charter bus parking area. • Show limousine parking area. • Show media parking area. • Show venue employee parking area.
Disabled parking areas	• State specific location (e.g., first row) of disabled-only spaces in general parking areas. • Indicate number of spaces available.
Other considerations	• Show aerial map. • Promote advance purchase (permit) options. • Indicate towed vehicle (e.g., illegally parked) pick-up area. • Emphasize new provisions (e.g., new parking areas, etc.). • Present map in grid format for easy reference. • Prepare maps for different venue events if parking plan varies. • Draw map to scale. • Show private property. • Display landmarks. • Indicate municipal fireworks viewing areas.

Figure 6-16
Annotated Aerial Map of Venue Site *(Photo courtesy of the Pepsi Center.)*

Figure 6-17
Downtown Area Venue Parking Map
(Graphic courtesy of the Conseco Fieldhouse)

Table 6-14
Considerations for Posting Plans on an Internet Website

CONSIDERATION
• Recognize detailed plans and maps may be difficult to read, especially when compressed for easy downloading. • Create an interactive plan to better present detailed information contained in the plan. • Allow users to access information on specific entities via hyperlinks embedded in the plan. • Provide a black and white version of plans for event patrons to download and print. • Provide text directions to support plans. • Provide maps and directions based on point of origin (e.g., city or roadway).

Figure 6-18
Mode Transfer Point

As with planned special event travel demand, peak event-generated pedestrian demand rates vary by event category:

- A discrete/recurring event at a permanent venue is characterized by high peak pedestrian arrival and departure rates. Maximum pedestrian demand occurs after the end of a discrete event, and the high demand level meters pedestrian flow to event parking areas and transit/shuttle stations, thus metering vehicle departures from the venue area.
- High attendance at continuous events and street use events yields high pedes-

trian traffic traversing the adjacent street system for a sustained period of time.

Existing pedestrian facilities, namely sidewalks and crosswalks as illustrated in Figure 6-19, can not adequately accommodate pedestrian traffic in the vicinity of a planned special event venue during ingress or egress. If stakeholders fail to implement proper pedestrian control measures, then pedestrians will risk exposure to moving traffic and traverse travel lanes, causing traffic congestion, under heavy flow conditions. Also, the popularity of planned special event transit service requires advance consideration of moving pedestrians between an event venue and nearby transit stations.

Figure 6-19
At-Grade Pedestrian Crossings Adjacent to a Venue Gate

A successfully implemented pedestrian access plan for planned special events permits *rapid dispersion* of pedestrian flow. Although high pedestrian volumes encompass the immediate venue area during ingress and egress, the plan effects efficient access through a radial network of pedestrian routes. It also includes time-sensitive strategies to minimize overcrowding conditions at venue gates and mode transfer points. The plan also considers a continuous shuttle bus service operations detail to handle event patrons destined to/from satellite parking areas and transit stations not easily accessible by foot.

Pedestrian Control

Pedestrian access routes are comprised of two components:

- A *routing* component, consisting of sidewalks or paths between street intersections.
- A *crossing* component, consisting of infrastructure or other vehicle control measure that allows pedestrians to cross a street safely.

Planned special event pedestrian management involves the implementation of integrated control tactics to facilitate pedestrian routing and crossing between a mode transfer point and the event venue. Key considerations include:

- Pedestrian access route capacity represents the smallest of its routing and crossing component capacities.
- In a radial network, where pedestrian volume is highest at the center or venue, the event planning team should design pedestrian access routes to provide increasingly greater capacity from site area to venue.
- Another important planning and operations consideration involves preventing the intersection of pedestrian access routes. This results in overcrowding at the intersection point and compromises pedestrian safety, particularly if two streams of pedestrians intersect at a street crossing.
- Practitioners should design each access route to exclusively serve a venue gate and implement control tactics to prevent routes from converging until reaching the event venue.
- Associated tactics include erecting pedestrian crossing barriers, as shown in Figure 6-20, at street intersections and deploying roving law enforcement pa-

trols for pedestrian protection and crowd control.

Figure 6-20
Pedestrian Crossing Barrier

- Use of bicycle, equestrian, or all-terrain vehicle patrols allow officers to conveniently access and travel on streets, pedestrian access routes, and parking areas.
- A traffic operations agency can assist law enforcement in maintaining orderly pedestrian flow through the site area by using CCTV to monitor pedestrian travel and operations at critical crossing points. Shown in Figure 6-21, stakeholders managing travel for major events at the Daytona International Speedway successfully used portable CCTV cameras to monitor the pedestrian egress flow rate from the venue in addition to operations at several nearby street crossings.

Figure 6-21
Pedestrian Traffic Monitoring Via CCTV

Pedestrian Routing

Two strategies for managing pedestrian flow on walkways during planned special events include:

- Locating access route termini.
- Providing additional, temporary pedestrian walkway capacity.

Key design aspects to consider include:

- The event planning team and parking area operators should avoid having a pedestrian access route and parking area access point intersect.
- Vehicle turning movements in and out of access driveways impact pedestrian safety and flow, and the implementation of special traffic control measures reduces vehicle arrival rate to parking areas and may create congestion on parking area access roads. Instead, stakeholders should provide an uninterrupted pedestrian walkway, connecting a pedestrian access route to parking areas, and station volunteers inside parking areas to prevent pedestrian/vehicular conflicts.
- To effect pedestrian dispersion in the immediate area of the venue, locate temporary transit stations a sufficient distance away from venues while still affording event patrons a convenient walking distance. As a result, potential station overcrowding during event egress does not impede pedestrians from accessing routes leading to other mode transfer points. This tactic also benefits transit users as traffic management team personnel can better manage station queues by cordoning loading/unloading areas and closing street curb lanes to furnish additional queuing area not available adjacent to the venue.

Obtaining additional pedestrian walkway capacity involves increasing walkway width.

Tactics for achieving increased width include: (1) removing movable sidewalk obstacles, such as news racks and benches and (2) closing the adjacent street curb lane for pedestrian traffic. Key considerations include:

- Consider implementing the latter tactic between the event venue and access points to parking areas and pick-up/drop-off areas, but terminate the lane at street intersections if turning traffic can traverse the pedestrian-designated curb lane.
- Use barricades and drums, coupled with law enforcement patrol, separate traffic and pedestrian flow.
- To satisfy both public safety agency and pedestrian accommodation needs, consider closing street segments adjacent to an event venue. For example, as shown in Figure 6-22, a closed street can function as a pedestrian access route and emergency access route.

Figure 6-22
Pedestrian Access Route and Emergency Access Route[8]

Pedestrian Crossing

Table 6-15 describes tactics for improving the safety and capacity of pedestrian street crossings.

Table 6-15
Pedestrian Crossing Tactics

TACTIC	APPLICATION
Temporary pedestrian bridge	• Provides uninterrupted flow. • Achieves total separation of pedestrians and vehicles. • Enhances pedestrian safety.
Street closure	• Provides uninterrupted flow. • Accommodates very heavy pedestrian volume. • Allows pedestrian dispersion. • Requires officer control.
Mid-block street crossing	• Provides interrupted flow. • Avoids pedestrian conflict with turning vehicles. • Requires officer control.
Staffed crossings	• Provides interrupted flow. • Accommodates light pedestrian volume.

Use of a temporary pedestrian bridge represents an effective tactic for crossing wide streets or roadways where traffic throughput is emphasized. Advantages include safety and minimal traffic management team staffing requirements. Disadvantages include cost and the lack of access for disabled persons. Figure 6-23 shows a temporary, prefabricated pedestrian bridge that was successfully deployed during the 1995 U.S. Golf Open as a pedestrian crossing, over an arterial roadway and the Long Island Rail Road, between the event venue and two mode transfer points (transit station and VIP parking area).

Figure 6-23
Temporary Pedestrian Bridge

Temporary street closures during event egress allow the venue to empty faster and permits pedestrians to disperse to a number of adjacent mode transfer points and pedestrian access routes. Recognize that heavy pedestrian flow on street crosswalks near venue gates significantly reduces traffic turning movement capacity. Therefore, total street closure mainly impacts cross street through traffic flow, traffic that can be diverted away from the immediate venue area. The traffic management team reopens the street when traffic signal phasing can accommodate remaining pedestrian demand. As shown in Figure 6-24, law enforcement may close a road segment(s) adjacent to the main gate of a continuous event to alleviate the need to staff multiple at-grade crossings as patrons arrive and depart throughout the event day.

Figure 6-24
Road Closure Adjacent to Event Venue

Figure 6-25 shows a staffed, mid-block pedestrian crossing. Mid-block crossings not only reduce the likelihood of vehicle-pedestrian collisions, but accident severity as well. As with all staffed crossings, traffic management team supervisors should establish the relative priority of competing pedestrian and traffic movements and communicate that priority to officers controlling such crossings.

Figure 6-25
Staffed Mid-block Crossing

Analysis

Practitioners should analyze the level of service of major pedestrian access routes and crossings, first and foremost to ensure anticipated pedestrian demand levels do not exceed available capacity at any time during event ingress and egress. Overcrowding on pedestrian facilities compromises the safety of pedestrians and may interfere with adjacent street traffic flow.

The Highway Capacity Manual (HCM) includes procedures for computing capacity and level of service for various types of pedestrian routes and crossings, summarized in Table 6-16.[9] With regard to capacity, a Level of Service E indicates design volumes approach the limit of facility capacity. The HCM also discusses characteristics of pedestrian flow and various performance measures.

Table 6-16
Pedestrian Facilities Covered in the Highway Capacity Manual

FACILITY TYPE
• Walkways and sidewalks • Pedestrian queuing areas (e.g., transit/shuttle stations and street crossing areas) • Pedestrian crosswalks at signalized and unsignalized intersections • Pedestrian facilities along urban streets (e.g., extended pedestrian facilities with both interrupted and uninterrupted flows)

Disabled Accessibility

The pedestrian access plan must accommodate disabled event patrons arriving via all travel modes serving a planned special event. This involves examining all routes that a disabled event patron may traverse and, in turn, ensuring the patron has an unimpeded path from mode transfer point to venue seat. Accessible pedestrian routes must: (1) maintain a minimum path width, (2) include curb cuts and temporary ramps for negotiating grade separations, and (3) conform to local Americans with Disabilities Act (ADA) regulations. If a particular route (e.g., from express/charter bus station or transit station) does not meet accessibility requirements, then accessible shuttles must operate between affected mode transfer points and accessible pick-up/drop-off areas.

Permanent venue parking areas have designated accessible parking and pick-up/drop-off areas that provide disabled event patrons with unobstructed access to event venue gates. This does not apply for temporary venues or locations of street use events. Disabled parking spaces at municipal and private parking areas serving continuous events and street use events may be located too far a distance from venue gates or event viewing areas. Each individual special event parking area includes a minimum number of disabled parking spaces to meet ADA regulations, thus rendering an on-demand, accessible shuttle operation from the lot impractical. As a result, the event planning team should sign and staff one parking area, nearest to venue gates or prime event viewing areas, for disabled parking. Figure 6-26 shows an access point to a municipal lot designated a disabled parking area for a downtown planned special event at a temporary venue.

Figure 6-26
Special Event Disabled Parking Area Access Point

Shuttle Bus Service

A shuttle bus service should be operated continuously within the venue site area during event ingress and egress, with the service schedule revolving around event patron arrivals and departures. Common shuttle service to/from a planned special event venue include: (1) satellite parking area service, (2) transit station service, and (3) employee parking area service. A particular planned special event may involve multiple private and public (e.g., transit agency) shuttle service operators, all of whom must co-

ordinate with the event planning team on service details and station locations.

The shuttle bus service planning process should incorporate the considerations listed in Table 6-17. These considerations impact the overall travel choice utility associated with the activity network supported by a shuttle bus service. Its design and operation on the day-of-event must satisfy a range of user needs, summarized in Table 6-18. These needs pertain to service and station provisions. Successful shuttle bus services positively influence the travel mode or destination (e.g., off-site) choice made by persons traveling to and from a planned special event. As illustrated by the event website promotion displayed in Figure 6-27, an event public information campaign may spotlight shuttle bus operations to promote alternate travel options, such as transit use or parking at a satellite parking area.

Table 6-17
Considerations in Shuttle Bus Operations[10]

CONSIDERATION
• Travel time
• Directness
• Avoidance of traffic problem areas
• Separation of shuttle buses from event traffic
• Boarding locations
• Ability to load/unload passengers simultaneously on several buses
• Pedestrian routing
• Neighborhood impacts

Table 6-18
Shuttle Bus Service User Needs[11]

NEED
• Have less than a 5-minute wait time.
• Have a short or moving embarking queue.
• Have an on-time arrival.
• Be free of confusion.
• Be protected from weather conditions.
• Have less than a quarter-mile walk to/from the shuttle station.

"QUICK SCHOTT" FROM NEW BUCKEYE LOTS SHUTTLE INFO:
*FREE SHUTTLE
*Parking is $5 at all Mens Basketball Games and Select Special Events
*Easy access to the freeway after the event
*Bus arrives every 5-10 minutes
*Disability shuttles available
DIRECTIONS: From 315: Exit Ackerman Road and proceed east on Ackerman Road. Turn right onto Fred Taylor Dr. Buckeye Lots will be on your right side.

Figure 6-27
Shuttle Bus Service Promotion *(Graphic courtesy of The Ohio State University.)*

Service Design

The end result in shuttle bus service design involves determining the required number of buses to meet expected ridership levels. Based on event category and associated operations characteristics, the number of shuttle buses needed during event ingress and egress may vary. Discrete, recurring events at a permanent venue demand maximum service at the end of the event.

Primary service design inputs include event patron arrival and minimum service headway (e.g., time between bus arrivals). To estimate the magnitude and rate of arrival, consult parking demand analysis and travel forecast results applicable to the mode transfer point(s) (e.g., parking area or transit station) to be serviced by the shuttle bus. Utilize vehicle occupancy figures referenced in the event feasibility study to convert vehicle-trips to person-trips in order to develop shuttle ridership estimates. The shuttle bus service will serve approximately the same number of persons during egress operation as it does during ingress operation. As previously noted, demand rates likely may vary. On the day-of-event, service operators should utilize ingress passenger counts to reevaluate service needs before the planned special event ends.

Minimum service headway represents a function of route service time. The following equation defines route service time:

Route service time = (Round-trip travel time) + (Number of shuttle bus stations on

*route) * (Average passenger loading time at one station + Average passenger unloading time at one station + Average dwell time at one station)*

Travel time estimates must reflect day-of-event operations and may vary depending on transit accommodation strategies contained in the event traffic control plan. The following equation defines minimum service headway:

Minimum service headway = (Route service time) / (Number of shuttle buses operating on a specific route at any given time)

The following steps describe how to determine the required capacity to successfully operate a shuttle bus service on a particular route:

- First, design the shuttle bus fleet size based on the criteria of providing a minimum service headway less than the maximum desired user wait time. Using the above equation for minimum service headway: (1) substitute the maximum desired user wait time for minimum service headway, (2) insert the route service time, and (3) solve for the number of shuttle buses required on the route, rounding up to account for the user wait time criteria. Note that the service headway between successive shuttle buses may be greater than the minimum service headway if the fleet of buses assigned to a particular route are not perfectly staggered to yield equal headways between buses.
- Second, compare the event patron rate of arrival to the rate of available shuttle bus seats per unit of time. To accommodate pedestrian flow during peak periods of ingress and egress, practitioners should consider a sub-hourly analysis (e.g., peak 15 or 30 minutes) using the highest anticipated event patron arrival rates. For analysis purposes, arrival rate refers to the rate of pedestrians arriving to a shuttle bus station at a parking area/transit station and at a venue during event ingress and egress operations, respectively. Practitioners should increase the number of shuttle buses serving a particular route, as necessary based on analysis results, to meet peak event patron arrival rates and avoid overcrowding at shuttle bus stations.
- Third, account for dwell time and event patron demand at all shuttle bus stations serviced by a particular shuttle route.

Station Design

A temporary shuttle bus station will exist at both a mode transfer point and at the event venue. Station design and operations should facilitate the rapid loading and unloading of shuttle passengers without impacting adjacent traffic operations and pedestrian movement. Because of the high concentration of pedestrian traffic at the event venue during ingress and egress, venue station design is critical. On-site shuttle bus stations should: (1) facilitate easy shuttle bus access, (2) provide a defined passenger waiting area, (3) promote an orderly queue formation, and (4) shield waiting passengers from adjacent vehicular and pedestrian traffic. Figure 6-28 shows an on-site shuttle bus station located adjacent to a roadway designated exclusively for bus use during a rural planned special event. Table 6-19 summarizes key considerations that surround shuttle bus station design.

Figure 6-28
On-Site Shuttle Bus Station

Management

Shuttle bus service operators should have access to pertinent traffic management team radio communication channels and/or consider stationing a supervisor in the event command post. Station volunteers can monitor passenger queuing and loading/unloading times. Bus operators can monitor passenger volume and communicate bus travel time and location. The service supervisor, in turn, directs service response to schedule delays, bus breakdowns, station overcrowding, and traffic incidents blocking service routes.

Table 6-19
Considerations in Shuttle Bus Station Design

CONSIDERATION	TACTIC	BENEFIT
Location at venue	• Designate an exclusive curbside bus lane on a road segment adjacent to the venue. • Locate station adjacent to bus lane but away from venue gates. • Design bus loading areas and turnarounds by using appropriate bus turning templates. • Layout bus turnarounds in the field and use the selected bus size for a test drive to assure U-turns can be accommodated without requiring the bus to back-up.	• Avoids pedestrians using shuttle from crossing streets. • Assures safe and efficient design for bus movements.
Pedestrian management	• Connect stations to planned pedestrian access routes. • Enclose passenger waiting area with temporary barriers (e.g., snow fencing or barricades)	• Improves passenger safety. • Minimizes conflict with other pedestrian traffic.
Shuttle loading	• Designate sections within passenger waiting area that correspond to different shuttle bus destinations (if any). • Erect signs disseminating information on fare structure, ticket purchasing, and important regulations. • Deploy volunteers to answer questions and assist passengers in shuttle embarking and disembarking. • Create ability to load/unload several buses simultaneously.	• Reduces shuttle loading time. • Eliminates passenger confusion.
Passenger comfort	• Provide shelter over station (e.g., tent).	• Creates a landmark for identifying the station. • Keeps passengers protected from weather conditions.

Shuttle bus operation contingency plans should include alternate shuttle routes in the event of a traffic incident occurrence. The alternate route should traverse a completely different set of streets than the preferred route. Service operators should maintain an operations and route detail for any parking areas denoted as an alternate (e.g., for overflow or weather reasons) to the primary lot served by the service. Other applicable contingency information includes temporary service locations for bus maintenance and fueling.

Cost

The operation of a shuttle bus service likely will realize greater efficiency for discrete events compared to continuous events such as fairs and festivals. Funding is obtained through satellite parking area fees, corporate sponsorship, or general event revenues. In some cases, parking is free, and the shuttle service charges a nominal fare to passengers. This arrangement may cause delays during passenger embarking, particularly if the bus operator must collect fares. Shuttle users likely will resist any fare charged for shuttle bus service from a transit station. Therefore, a fare-based shuttle service could significantly impact the utility that event patrons assign to transit when considering planned special event travel options.

Plan Specifications

Table 6-20 lists pertinent pedestrian access plan informational elements of interest to event patrons and participants. A traffic flow map or traffic control plan, prepared as a traveler information tool, may contain callouts to pedestrian facilities and day-of-event control tactics. Traffic management team personnel will require an implementation plan tailored to each pedestrian management initiative.

Table 6-20
Pedestrian Access Plan Checklist

ELEMENT
• Show recommended pedestrian access routes. • Show pedestrian bridges and tunnels. • Indicate special pedestrian crossing tactics (e.g., street closure or mid-block crossings) • Show shuttle bus route, direction of travel, stop locations, and loading and unloading areas. • Show vertical connections between infrastructure levels (e.g., stairs, escalator, elevator, ramps). • Show designated pedestrian crossings at street use event venues. • Indicate special regulations. • Highlight pedestrian access routes and crossings suitable for disabled event patrons.

TRAFFIC FLOW PLAN 

Overview

The preparation of a traffic flow plan represents a required preliminary step to the design of a traffic control plan. The traffic demand analysis component of a feasibility study indicates the freeway/arterial corridors and local streets that event patrons will utilize to access the venue site area. In developing a traffic flow plan, the event planning team modifies predicted flow routes to maximize transportation system operating efficiency on the day-of-event while meeting public safety agency needs. In turn, a traffic control plan facilitates traffic flow on recommended flow routes through service-enhancing strategies and tactics that handle forecasted event traffic demand on these routes.

The advantage of developing a traffic flow plan is two-fold:

- Allows the event planning team to influence and control event patron patterns of ingress and egress. This improves transportation system operations and reduces

the impact to neighborhoods surrounding the event venue.

- Provides important advance information for event patrons and participants regarding *best access* routes to the event. These directions provide event patrons, particularly those not familiar with the region, an increased level of comfort when traveling on the day-of-event. Event patrons also recognize that the traffic management team will sign, staff, and prioritize flow on designated routes. Non-attendee transportation system users benefit by gaining advance notice of event-designated traffic and transit routes.

Information Requirements

Table 6-21 lists various sources of data and information that drive the traffic flow plan development process. Key points that should be considered include:

Table 6-21
Traffic Flow Plan Information Sources

SOURCE

• Market area analysis
  o Regional directional distribution
• Traffic demand analysis
  o Local directional distribution
  o Day-of-event traffic demand
• Site access and parking plan
  o Parking area assignment
• Road closures required for event staging
  o Street use event
• Public safety agency requirements
  o Emergency access routes
• Transit agency requirements
  o Scheduled and event service

- A traffic flow plan should accommodate background traffic flow in addition to transit service, which will be promoted as an event patron travel alternative.
- Recommended traffic flow routes should not traverse or intersect emergency access routes, if possible.
- Event mandated road closures refer, in particular, to street use event parade and race routes. If not already designated, the event planning team should first determine the street use route.
  - Table 6-22 provides a general checklist for evaluating the impact of closing one or more adjoining street segments, while Figure 6-29 shows a parade staging area.
  - Typical staging areas include off-street parking areas and cross streets adjacent to the parade route.
  - Upon reviewing the street closure checklist, the event planning team should consult with community interest stakeholders and public safety agencies in order to identify all concerns and solicit input.

Another key information component concerns the identification of roadway capacity deficiencies or bottleneck locations. This includes freeway weaving areas, freeway ramp junctions, freeway/street lane-drops, and intersection traffic control. Bottleneck locations yield a constant rate of flow (e.g., saturation rate), and appropriate traffic control strategies can temporarily alleviate the bottleneck on the day-of-event by increasing saturation flow rate. Consult the feasibility study roadway capacity analysis results or conduct new analyses to evaluate operations on traffic flow routes not previously considered. In addition, practitioners should consider driving, and creating a video/photo log, of proposed traffic flow routes, emergency access routes, and transit routes. This activity assists in verifying computer analysis results and facilitating off-site event planning team evaluation of recommended routes.

Table 6-22
Road Closure Impact Checklist[12]

ELEMENT	PROVISION
One-way street operation	• Does not significantly disrupt traffic operations on adjacent one-way streets.

Impacts on access	• Does not have an adverse impact on:
	  • Public safety agency station access
	  • Hospital access
	  • Local resident neighborhood access
	  • Public facility access (e.g., schools, parks, etc.)
	  • Access to places of worship
	  • Access to local businesses
	  • Heavy vehicle access
	  • Public transit access

Parade staging area	• Provide sufficient area for parade staging.
Coincidence with roadway construction	• Does not conflict with existing roadway construction activities.
Proximity to major traffic generators	• Has no adverse impact on nearby major traffic generator (e.g., shopping center, entertainment venue, etc.).

Presence of alternate routes for local access	• Has available alternate routes for local access.
	  • Width of traveled-way and number/designation of travel lanes
	  • Traffic control (e.g., traffic signals and signs)
	  • Street signage
	  • Restricted traffic movements
	  • Presence of impeding traffic calming devices

Figure 6-29
Parade Staging Area

Strategic Route Planning

The traffic flow plan must account for two types of traffic flow routes: *corridor* and *local*:

- Corridor flow routes include the freeways and major arterial roadways serving the planned special event venue.
- Local flow routes traverse the street system adjacent to the event venue and service a particular parking area or pick-up/drop-off point.
- A *target point* represents the point of connection between corridor and local flow routes, characterized by a freeway interchange or major arterial intersection.
  - In the driver's mindset, reaching a target point during event ingress signals entrance into the local area surrounding the event site. At this point, the driver anticipates receiving information and directions on event parking and pick-up/drop-off areas.
  - During event egress, the driver's objective involves reaching the nearest target point (e.g., freeway interchange) in order to access a familiar corridor flow route leading toward home or some other destination.

- On the day-of-event, the management of corridor flow routes typically involves surveillance and dissemination of traveler information regarding target point and local flow route operations. The traffic management team implements traffic control initiatives beginning at the target point and continuing along the local flow route.
    - Figure 6-30 displays a traffic flow plan that indicates, for reference by event patrons, various target points for access to individual venue parking areas.

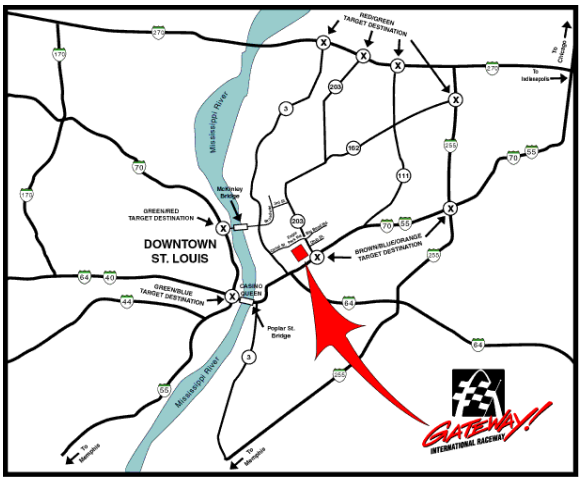

Figure 6-30
Corridor Target Points *(Graphic courtesy of Dover Motorsports, Inc.)*

Table 6-23 indicates general considerations for developing traffic flow routes. Figure 6-31 shows one corridor flow route spawning, via two target points, three local flow routes destined to the same venue access point. The figure demonstrates how a traffic flow plan works to assure that traffic demand on the existing street system adjacent to an event venue does not exceed capacity on the day-of-event if signed and staffed appropriately.

Table 6-23
Traffic Flow Route Development Considerations

CONSIDERATION
• Focus on ingress and egress operations separately. • Avoid left-turn movements across traffic flow. • Divert traffic flow routes from critical locations (e.g., other flow routes) that could create congestion. • Develop multiple local flow routes, connected to one corridor flow route, as necessary to achieve optimum traffic distribution on the roadway system. • Assign local flow routes to contingency overflow parking areas identified in the site access and parking plan.

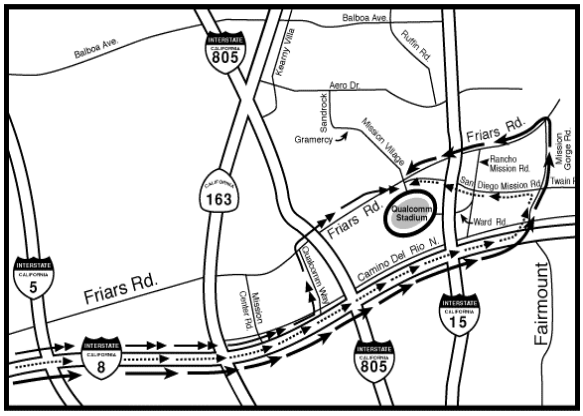

Figure 6-31
Multiple Local Traffic Flow Routes
(Graphic courtesy of the City of San Diego.)

Figure 6-32 describes a process for assessing corridor and/or local traffic flow routes. Traffic control strategies for increasing corridor route capacity include eliminating weaving areas or other ramp control tactics. Strategies for local routes include striping additional travel lanes to handle flow in the predominant direction, restricting turning movements, and revising traffic signal timing plans. The "Traffic Control Plan" section of this chapter describes these strategies and other mitigation alternatives in greater detail.

Aside from parking contingencies and the occurrence of severe congestion on the day-of-event, practitioners should maintain and promote the same flow routes identified in the traffic flow plan. These routes are generally pre-signed and communicated to event patrons and participants prior to the event. Measures of effectiveness for evaluating the performance of designated traffic flow routes, in additional to corresponding traffic control strategies, include: (1) time to regain free-flow operations and (2) time to clear parking areas.

Alternate Routes

The deployment of an alternate route plan marks a key traffic management strategy for minimizing the effect of non-recurring congestion, caused by a traffic incident or event-generated traffic demand, on traffic flow. It serves to reduce demand at a traffic incident site or bottleneck through the diversion of traffic from the mainline to parallel freeways, arterials, and streets. As part of traffic incident management efforts, some jurisdictions may maintain alternate route plans for freeway and arterial segments traversing a region.

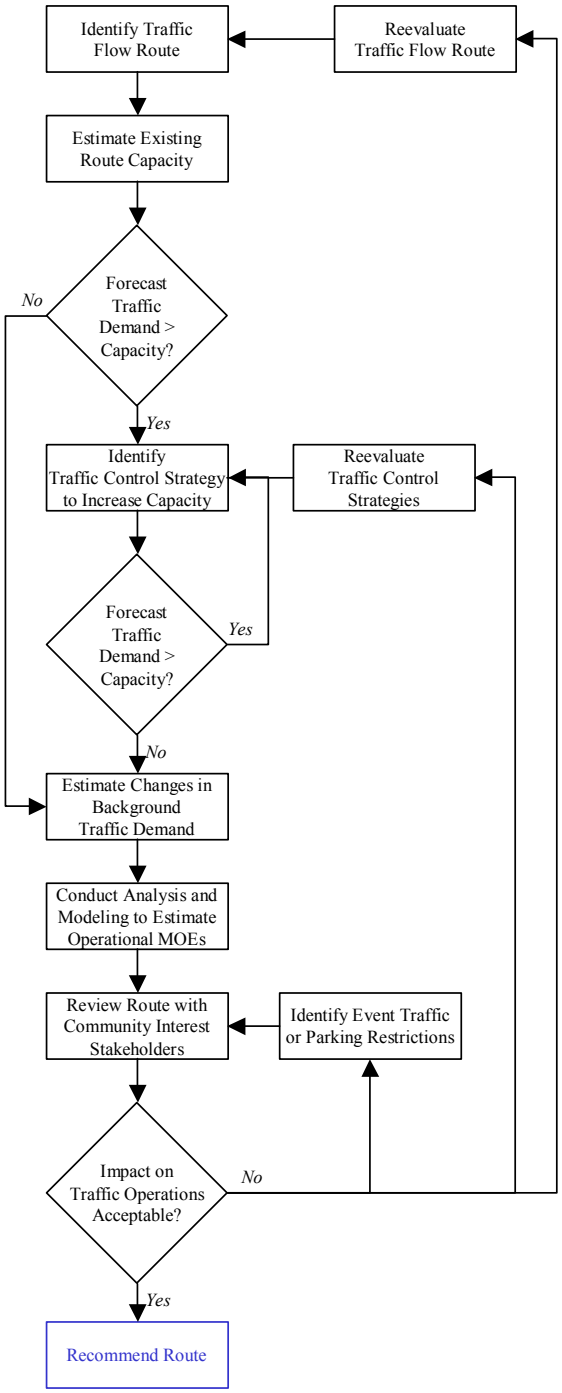

Figure 6-32
Traffic Flow Route Assessment Process

An alternate route plan represents a contingency plan that stakeholders should consider developing for corridors serving a planned special event venue, where high-speed crashes or cargo spills may block travel lanes for a long duration. In other instances, an alternate route plan becomes a critical component of the overall event traffic management plan when roadway or bridge construction activities limit the capacity of mainline corridor flow routes. Transportation system operators should also promote travel choice alternatives, such as using other travel modes, as an option to driving alternate routes.

The process of developing alternate route plans and procedures for plan deployment requires a group endeavor involving all affected agencies, most of which likely comprise the event planning team and/or traffic management team. Table 6-24 lists the steps required in developing an alternate route plan. Practitioners should consult NCHRP Synthesis 279, *Roadway Incident Diversion Practices*, for state-of-the-practice information about the development and deployment of alternate route plans.[13] Table 6-25 highlights numerous considerations in alternate route plan development, all of which are addressed in the cited synthesis report.

Table 6-24
Alternate Route Plan Development Process

STEP
• Identify mainline bottleneck or problem locations.
• Evaluate proposed alternate routes.
• Determine appropriate criteria for plan deployment.
• Achieve participating agency agreement on roles and responsibilities.
• Identify equipment and personnel resources required to deploy an alternate route plan.
• Establish guidelines for plan evaluation and updating.

The effectiveness of deploying an alternate route plan revolves around the accommodation of diverted traffic along the alternate route. It is essential that the diverted traffic encounter an equal or higher level of service on the alternate route compared with that on the mainline. As shown in Figure 6-33, alternate route plan deployment, particularly plans developed specifically for a planned special event, typically requires significant law enforcement resources for alternate route traffic management and operations surveillance. Technology applications for managing traffic on an alternate route, and reducing field personnel requirements, include the installation of dynamic route guidance signs controllable from a transportation operations center. Figure 6-34 shows a dynamic trailblazer sign. During the program planning phase, stakeholders managing recurring planned special events at permanent venues should evaluate the need for installing these devices along commonly used alternate routes serving the event venue.

Emergency Access Routes

Emergency access route planning involves designating street closures within the venue site area to connect the some or all of the following termini: (1) public safety (e.g., fire and emergency medical service) headquarters, (2) local hospital, (3) freeway or major arterial serving a regional hospital, and (4) location of staged ambulances and first-aid stations for on-site medical treatment.

Table 6-25
Alternate Route Plan Development Considerations

ITEM	CONSIDERATION
Alternate Route Selection	
• Stakeholder Roles and Coordination	• Advance planning stakeholders and stakeholders involved in alternate route deployment • Interagency agreements for advance planning and/or operations
• Types of Alternate Routes	• Freeway, street, and toll facility • Secondary alternate routes
• Inventory Potential Alternate Routes	• Access, capacity, vehicle restrictions, traffic control, background traffic, pavement conditions, road geometrics, percentage of heavy vehicles, transit accommodation, and available surveillance • Considerations in rural, urban, and metropolitan areas
• Alternate Route Evaluation	• Capacity analysis and modeling • Traffic signal timing optimization
• Alternate Route Selection Criteria	• Road user and community impacts
Alternate Route Plan Development	
• Alternate Route Plan Map	• Incident location limits, direction of routed traffic, ramp/street closures, traffic control resources, alternate route distance and capacity, alternate route regulations and restrictions, and emergency service stations
• Traffic Control Requirements	• Traffic control officers, temporary signs, and barricades
• Criteria for Alternate Route Plan Deployment	• Incident duration, number of lanes blocked, time of day, etc.
• Deployment Operations Plan	• Checklist for field supervisor and communications center supervisor
Road User Accommodation	
• Motorist Information Resources	• Pre-trip and en-route • Message sets • Planned media release
• Traffic Management on Alternate Route	• Permanent trailblazers • Technology applications

Figure 6-33
Background Traffic Diversion

Figure 6-34
Dynamic Route Guidance Sign *(Photo courtesy of the Minnesota DOT.)*

For large-scale planned special events, emergency access routes remain closed to all non-emergency vehicles. Traffic control officers staff each intersection along the route and permit side street traffic to cross the route when conditions permit. For smaller-scale special events, the emergency access route denotes a local flow route for emergency vehicles that may be utilized by general traffic under non-emergency conditions. Under an emergency scenario, law enforcement officers may escort emergency vehicles, using a rolling roadblock, via the designated access route. Emergency access routes should not traverse or intersect event patron traffic flow routes to/from the event venue and associated parking areas.

The provision of emergency access lanes along streets slated for closure in order to stage a planned special event allows unimpeded emergency vehicle access throughout the entire local street network impacted by the event. This particularly applies to street use event routes. Typical specifications for an emergency access lane involve delineating a 20 foot wide, paved curb lane within the existing roadbed (e.g., shoulder plus traveled-way).

Background Traffic Accommodation

The composition of background traffic, or non-attendee motorists, traversing streets and highways in the vicinity of a planned special event venue include the following categories:

- Regional through traffic
  - Includes truckers and intra- or inter state travelers represent regional through traffic.
- Local through traffic
  - Includes commuters and area residents, some of whom may simply cruise local streets adjacent to the event.
- Neighborhood residents and businesses
  - Includes residents living in the immediate vicinity of the event venue that may incur impacts attributed to high traffic demand and temporary traffic control strategies.
  - Includes nearby businesses requiring accommodation for both employees and patrons.

Table 6-26 presents a range of passive (e.g., traveler information dissemination only) and aggressive (e.g., physical traffic control) tactics for accommodating background traffic during a planned special event.

Table 6-26
Tactics for Accommodating Background Traffic during Planned Special Events

USER GROUP	TACTIC	BENEFIT
Regional through traffic	• Freeway-to-freeway diversion beginning a significant distance upstream of an event venue.	• Maintains mobility. • Reduces the level of background traffic on corridor flow routes serving the venue.
Local through traffic	• Arterial-to-arterial diversion	• Eliminates non-attendee exposure to venue site area. • Discourages cruising around site area. • Allows public to become familiar with route after repeated implementation.
Neighborhood residents and businesses	• Parking restrictions	• Permits resident access to on-street parking spaces. • Permits employee and customer access to public parking areas.
	• Traffic control points	• Restricts neighborhood area access to residents and business employees.
	• Signing and alternate routes	• Directs customers to businesses and other traffic generators.

Freeway-to-Freeway Diversion

Transportation management system operators can implement freeway-to-freeway diversion through control of permanent changeable message signs and highway advisory radio.

Parking Restrictions

Parking restrictions accomplish the task of preventing event-generated traffic from deviating from local event traffic flow routes and traversing neighborhood residential and commercial areas.

Traffic Control Points

Road closures may impact customer access to businesses and other traffic generators. Figure 6-35 shows a sign diverting traffic destined to a major traffic generator located adjacent to a planned special event temporary venue.

Large-scale events may generate sufficient traffic demand to saturate the entire local street system adjacent to the event venue, causing undue congestion and blocking neighborhood access and circulation patterns. If this represents a potential concern during advance planning, then locate event parking areas a sufficient distance away from affected neighborhood areas and create traffic control points to prevent event-generated traffic from penetrating these areas. Residents and business employees would receive a pass allowing them access through the traffic control points.

Figure 6-35
Accommodation of Traffic Destined to Major Generators

Arterial-to-Arterial Diversion

Arterial-to-arterial diversion applies to planned special events occurring in city downtown or commercial areas, where arterials and local streets adjacent to the event venue serve a significant volume of background traffic. In turn, the addition of event-generated traffic causes congestion and impacts commercial businesses (e.g., restaurants, hotels, retail stores). This tactic involves: (1) restricting commercial street access to businesses employees, customers, emergency vehicles, taxis, and transit buses and (2) deploying an alternate route to direct background through traffic and event-generated traffic around the restricted street.

Planned special event stakeholders in Atlanta, Georgia developed such an alternate route, entitled the "Blue Loop" to divert traffic away from restricted Peachtree Street during special events in downtown Atlanta.[14] Stakeholders prepared the plan during the program planning phase in response to lessons learned from past planned special events that occur in the Atlanta downtown area and generate significant automobile traffic. They hope the term "Blue Loop" becomes an alert that city residents will recognize and understand that the alternate route is in effect. Traffic monitoring represents a key to Blue Loop operation, and the route deployment detail specifies several release points for diverting Blue Loop traffic to adjacent highways.

Street use events involving a parade or road race permit the traffic management team to reopen certain roadway sections after event participants pass, even if the event has not completed. Background traffic accommodation includes disseminating specialized traveler information, summarized in Table 6-27, prior to the event. The information provides non-attendee transportation system users a timeframe, relative to the parade/race pace and field length, that certain route sections will be closed. Otherwise, travelers may mistakenly assume that the entire street use event route will remain closed for the duration of the parade or road race.

Table 6-27
Pre-Trip Traveler Information for Street Use Events

ITEM
• Indicate the entire parade or race route coupled with participant staging and disbanding areas.
• Estimate, based on the event pace and length of the field, and specify times each roadway segment and intersection will be closed and reopened.
• State other traffic and parking restrictions in the vicinity of the event course.
• Organize information for easy reference using maps and reference numbers (for intersections and roadway segments).

Transit Accommodation

A traffic management plan that prioritizes bus flow to and from the venue site area positively influences the utility associated with transit and other travel choices involving express bus, charter bus, or shuttle bus transport. Transit agencies should operate on scheduled bus transit routes up until the last possible point to divert around a road closure required to stage a planned special event. This avoids user confusion and minimizes inconvenience to non-event attendees.

Table 6-28 lists tactics for accommodating scheduled and event-generated bus service.

Table 6-28
Bus Accommodation Tactics

TACTIC
• Exclusive bus route
• Exclusive/priority bus lane
• On-demand communication with TMC or command post

Exclusive Bus Route

Exclusive bus routes that cause a negligible impact to background traffic and adjacent neighborhoods represent the recommended bus accommodation tactic. Advantages of exclusive bus routes include: (1) use of the same route during ingress and egress, (2) increased mobility and travel time reliability, and (3) better venue station accommodations for riders as temporary stations may exist adjacent to bus routes, thus avoiding conflicts with event vehicle and pedestrian traffic.

Depending on roadway network layout, a special event traffic flow plan may feature an exclusive bus route from corridor target points and satellite parking areas direct to designated pick-up/drop-off areas adjacent to the venue. Other bus routes may only divert buses around known bottleneck locations. Figure 6-36 shows an exclusive bus route implemented for a major rural planned special event. An exclusive bus route must accommodate minimum overpass height requirements, vehicle weight requirements, and vehicle turning radii.

Figure 6-36
Exclusive Bus Route

Exclusive/Priority Bus Lane

An exclusive bus lane represents a travel lane for bus traffic only. Temporary applications include converting an existing roadway shoulder or travel lane for bus use during a planned special event. Table 6-29 summarizes drawbacks associated with the temporary operation of an exclusive bus lane. A bus priority lane is used by both buses and general traffic between intersections. However, at intersection approaches such as that shown in Figure 6-37, regulations limit general traffic to a turning movement, while buses can continue straight through the intersection and "jump" adjacent through-lane queues.

Table 6-29
Exclusive Bus Lane Limitations

LIMITATION
• Lane may obstruct access to mid-block driveways.
• Mid-block turning movements may create queues in adjacent through travel lanes.
• Congestion may occur upstream of the lane start, especially if the lane utilizes an existing travel lane.
• Shoulder lane use may eliminate area for emergency stops.
• Manned intersection control may be required to allow buses and cars to turn in front of the other.
• Maintenance of signs and lane delineators are necessary.
• Special enforcement requirements are needed.

Figure 6-37
Bus Priority Lane

On-Demand Communication

On-demand communication with a command center represents another bus accom-

modation tactic that the traffic management team may employ in conjunction with other previously discussed tactics. Bus operations supervisors or other traffic management team personnel, stationed at the TMC or event command post, monitor roadway surveillance sources (e.g., CCTV and field observers) in order to identify areas of congestion before a bus encounters it. When supervisors verify a traffic bottleneck affecting a bus route, they immediately notify bus operators and work to divert buses around the congested area.

Plan Specifications

The traffic flow plan serves stakeholders managing the planned special event in addition to event patrons and participants. The product of strategic route planning involves informing event patrons of best access routes to and from the planned special event. Stakeholders can communicate preferred route directions via: (1) event patron ticket mailings, (2) media public information campaigns, and (3) event, venue, or traffic information websites.

Table 6-30 contains a traffic flow plan development checklist.

Appendix I contains example traffic flow maps prepared for various planned special events. (15)

Traffic flow plans should emphasize available express, charter, and shuttle bus services from regional park and ride lots and/or satellite parking areas. Driving directions should be accompanied by useful travel tips that coincide with the day-of-event operation of recommended traffic flow routes. Travel tips include accessing en-route traveler information and adhering to traffic control tactics.

TRAFFIC CONTROL PLAN 

Overview

Freeways represent corridor flow routes serving event patrons and participants destined to/from a planned special event from various parts of a region and beyond. These corridor flow routes connect to local, street-level flow routes that, in turn, serve event venue parking areas. A freeway interchange marks the point of connection, or target point, between corridor flow routes and local flow routes. Together, the three entities comprise the roadway system servicing a planned special event. The scope of traffic control expands and contracts, proportionally to system performance, during event ingress and egress.

The keys to successful transportation system management, including traffic and transit, during planned special events include:

- Real-time surveillance
- Open communications
- Planned response
- Rapid implementation

Planned response requires a detailed traffic control plan that facilitates a proactive traffic management team response to system deficiencies and unexpected events. The other keys depend on technology applications, such as remote surveillance and automated control of traveler information and traffic control devices, in addition to inter-jurisdictional coordination and collaboration.

Table 6-30
Traffic Flow Plan Checklist

ELEMENT	PROVISION
Event patron corridor flow route	• Indicate recommended freeway ramps, by route direction, to/from event venue or specific parking area. • Indicate corridor target points representing a connection to local flow routes. • State freeway or arterial lane assignments for event traffic (e.g., event traffic two right-lanes). • Furnish information on roadway construction projects, as applicable, and indicate alternate routes. • Indicate modified ramp control tactics (e.g., closures/additional lanes). • Show freeway interchange configurations (and direction of travel) and exit numbers. • State tolls, if applicable.
Event patron local flow route	• Show connection to corridor flow route. • Indicate local streets that connect to freeway entrance/exit ramps. • Indicate recommended flow route to/from general and reserved parking areas (minimum) or individual parking areas (recommended). • Indicate one-way streets. • Show all road segment closures. • Specify permitted turning movements. • Emphasize controlled turn areas (turns prohibited or only one turn allowed). • List modified roadway striping (e.g., reversible lanes or contra-flow). • Indicate event participant/VIP access routes.
Traveler information	• Promote use of regional park & ride locations and event satellite parking areas. • Indicate commercial radio and highway advisory radio frequencies with event travel information. • Alert motorists of static and changeable message sign guidance along route. • Stress importance of following route and adhering to traffic control officer instructions.
Traffic management team information	• Include contingency maps detailing routes to overflow parking areas. • Provide written directions for diverting corridor flow routes via local street system. • Indicate alternate routes for ingress and egress to same target point.
Other travel modes / user groups	• Show transit routes and state corresponding route number(s). • Show preferred taxi routes. • Indicate bicycle routes. • Indicate pedestrian routes.
Other considerations	• Provide information on both ingress and egress flow routes. • Emphasize law enforcement endorsement of recommended routes and directions. • State travel times (by mode of travel) and distances (e.g., from select origins) • State when special traffic flow routes go into effect and terminate. • Disseminate written ingress/egress driving directions. • Indicate potential points of confusion (“do not take”) along recommended route (e.g., freeway exits, turning movements). • Indicate heavy vehicle restrictions. • Indicate expected congested/non-congested areas. • Use callouts to highlight critical movements. • Label all streets and freeways. • Color-code recommended routes to specific parking areas. • Emphasize new provisions (e.g., new road closures or route). • Prepare maps for different venue events if parking plan varies. • Show parking areas. • Show venue gates. • Draw map to scale. • Show private property. • Display landmarks.

Transportation system management typically involves state DOT operating freeways and county/local agencies operating streets and intersections along local flow routes. Planned special events place a premium on information sharing (e.g., CCTV feeds, traffic conditions, traffic incidents, etc.) between these agencies, through local/regional TMC operators and/or agency supervisors at the event command post. This information, and subsequent traffic management team collaboration, drives stakeholder selection and implementation of traffic control techniques.

Freeway Traffic Control

The main objective of freeway management during planned special events involves minimizing freeway mainline congestion. Freeway traffic control tactics implemented in response to local traffic flow or ramp operation degradation preserve freeway mainline operations. Freeway traffic control and management strategies for planned special events include traveler information dissemination and interchange operations.

Traveler Information

Traveler information disseminated upstream of freeway interchanges serving an event venue effectively: (1) introduces all freeway users to critical traffic management plan components affecting traffic flow in the vicinity of the event venue and (2) facilitates freeway lane management as motorists learn of temporary freeway ramp control tactics and/or downstream lane closures that warrant a lane-change. Under lane management, freeway operators strive to reduce turbulence at ramp junctions, weaving areas, and lane drops by alerting motorists to make necessary mainline lane-changes as soon as possible. This also reduces the level of uncertainty and potential indecision by drivers destined to the planned special event.

Common freeway operator methods of disseminating en-route traveler information to freeway users include use of:

- Changeable message signs
- Highway advisory radio
- Telephone information systems (e.g., 511 service)

The event planning team should develop CMS and HAR message sets specific to planned traffic management and control, during event ingress and egress, on the day-of-event. Supplemental planned message sets should exist for all special event contingency scenarios considered. The traffic management team can reference message boilerplates for other unexpected events such as traffic incidents. If stakeholders utilize 511 for planned special event travel management, then the event planning team should establish protocol for updating 511 recordings. This may involve coordinating with an agency office (e.g., state DOT headquarters) outside the region where the planned special event takes place. The overall advance planning effort improves traveler information accuracy and timeliness on the day-of-event.

En-route traveler information consists either of pre-event or day-of-event information. Prior to the event, permanent and portable CMSs located on freeways serving a planned special event can indicate that an upcoming planned special event may affect corridor travel or cite planned freeway ramp closures. In addition, CMS message sets can advise motorists to tune to an HAR frequency for a message containing additional, detailed information. Table 6-31 lists some HAR pre-event message considerations. These roadside traveler information device

messages should appear a few days before the event, including one weekday to inform commuters that use periodically the freeway corridor on weekends. This strategy also informs visiting event patrons that arrive to the host city prior to the day-of-event.

Table 6-31
Highway Advisory Radio Pre-Event Message Considerations

CONSIDERATION
• Planned special event(s) date, time, and location • Road closure(s) location • Road closure(s) date and time • Access to event parking areas • Traffic and parking restrictions • Alternate routes and modes of travel

Table 6-32 indicates some day-of-event message considerations.

Table 6-32
Highway Advisory Radio Day-of-Event Message Considerations

CONSIDERATION
• Directions to local traffic flow routes serving traffic destined to a venue • Road closure details • Event traffic and parking restrictions

Table 6-33 provides a range of CMS message templates for planned special events. To obtain specific and detailed guidance on the operation of and/or message design for large permanent CMSs or portable CMSs, practitioners should consult the FHWA report *Guidelines for Changeable Message Sign Messages*.[16] For example, Figure 6-38 shows a message displayed on a portable CMS positioned upstream of a freeway interchange serving event patron traffic.

Day-of-event HAR messages include directions on accessing local flow routes to a venue, road closure details, and event traffic and parking restrictions. Activation of HAR sign beacons should occur on the day-of-event only. By taking into consideration travel speed and HAR signal range, format HAR messages so that motorists can listen to each message at least twice. Ensure portable HAR coverage areas do not overlap with adjacent HAR signals.

Table 6-33
Changeable Message Sign Message Template

MESSAGE SET DISPLAY
Single Phase – All Freeway Users
• First line: traffic problem • Second line: problem location • Third line: recommended action
Single Phase – Specific User Group
• First/second line: user group (e.g., event patrons) • Second/third line: recommended action
Two Phases – Specific User Group
• First phase: user group • First/second phase: recommended action • Second phase: additional information sources (e.g., HAR)

Figure 6-38
Portable Changeable Message Sign *(Photo courtesy of the Wisconsin DOT.)*

Interchange Operations

Management of freeway interchange operations for planned special events involves maximizing ramp capacity and preventing freeway mainline congestion. Interchange ramps adjoining a freeway and modified local event traffic flow route may represent a system bottleneck if operators fail to im-

prove interchange capacity and operating efficiency. Traffic flow breakdowns can occur on ramps, at weaving areas, or at ramp junctions. Proactive interchange traffic control focuses on minimizing freeway mainline congestion and, during event egress, congestion spillback to local flow routes and adjoining event parking areas.

Table 6-34 presents interchange operations tactics for planned special events. Tactics such as ramp closures and rolling roadblocks represent short-term congestion mitigation measures deployed by the traffic management team on an as-needed basis. Other control tactics, such as the temporary elimination of a freeway weaving area shown in Figure 6-39, comprise the base traffic control plan for the planned special event and operate for a sustained period of time. Law enforcement officers can temporarily close ramps using their cruisers. However, other techniques that reduce valuable personnel requirements include using Type 3 barricades and traffic cones for longer closures. Figure 6-40 shows an example of reinforcing a barrier line, by deploying traffic cones coupled with pedestal-mounted signing, to prohibit late diverges from a freeway mainline. Freeway operators may develop new ramp metering plans based on forecasted traffic volumes and the location of controlling bottlenecks identified through analysis and modeling.

Freeway and interchange operations management during planned special events demands real-time surveillance and control capabilities. Outside of a permanent TMC, wireless and Internet connections allow the traffic management team remote access to CCTV in addition to CMS and HAR devices. As shown in Figure 6-41, freeway operators stationed at an event command post can view CCTV video at critical locations and, in turn, change CMS messages via a laptop computer or HAR messages through a cellular telephone call.

Street Traffic Control

The central traffic control strategy for local flow routes serving a planned special event involves *emphasizing throughput*. Tactics that increase street capacity include a combination of: (1) on-street parking restrictions, (2) vehicle travel on road shoulders, and (3) alternative lane operations. Streets connecting freeway/arterial corridor routes and venue parking areas characteristically serve a predominant directional traffic flow during ingress and the reverse flow during egress.

The following section examines alternative lane operation techniques for handling high-volume flow in one direction.

Alternative Lane Operations

Alternative lane operations comprise two categories:

- Reversible lane operation
- Contraflow operation

Reversible lane operation involves using one or more travel or auxiliary (e.g., two-way left turn lane) lanes for travel in the opposite direction. The street or highway operates as two-way; however, additional travel lanes serve traffic in the predominant direction of flow.

Contraflow operation involves converting a roadway corridor from two-way to one-way operation only.

Major metropolitan areas, such as Washington, D.C., use daily reversible lane (see Figure 6-42) and contraflow (see Figure 6-43) operation to efficiently handle commuter traffic to/from the downtown area.

Table 6-34
Interchange Operations Tactics for Planned Special Events

TACTIC	EVENT TIME	APPLICATION	BENEFIT
Rolling road block	Ingress	• Initiate tactic on freeway mainline upstream of congested interchange ramp(s).	• Alleviates traffic demand at interchange, thus permitting street or ramp bottleneck to dissipate.
	Egress	• Initiate tactic on freeway mainline upstream of a congested ramp junction or weaving area. • Use tactic to meter freeway mainline traffic demand without creating a secondary bottleneck upstream of the congested area.	• Reduces level of congestion at the primary bottleneck location.
Entrance ramp closure	Ingress	• Initiate tactic on ramps in close proximity to and upstream of interchange target point for event traffic. • Divert affected traffic to another downstream access point.	• Eliminates congestion caused by traffic merging with heavy freeway mainline traffic.
	Egress	• Initiate tactic as necessary to reduce freeway mainline congestion in the vicinity of closely-spaced entrance ramps.	• Reduces freeway mainline congestion or prevents congestion from occurring.
Exit ramp closure	Ingress	• Close ramp, as needed, to alleviate congestion on a downstream local flow route. • Initiate only if a downstream exit ramp and local street system can handle diverted traffic.	• Reduces congestion on local flow route.
	Egress	• Initiate tactic at freeway interchanges connecting local traffic flow routes that have special egress traffic control measures in effect.	• Prevents traffic from accessing local flow routes in the direction of the event venue that operate in favor of egress traffic flow.
Elimination of weaving area	Ingress	• Close cloverleaf interchange entrance ramp to facilitate unimpeded diverge to access adjacent exit ramp.	• Eliminates weaving area congestion. • Extends deceleration lane for traffic using exit ramp.
	Egress	• Close cloverleaf interchange exit ramp and mainline right-lane to facilitate unimpeded merge with mainline.	• Eliminates weaving area congestion. • Extends acceleration lane for traffic using entrance ramp.
Ramp metering	Ingress	• Meter freeway entrance ramps upstream of interchange target point for event traffic.	• Reduces congestion caused by traffic merging with heavy freeway mainline traffic.
	Egress	• Meter freeway entrance ramps downstream of interchange target point for event traffic	• Reduces congestion caused by traffic merging with heavy freeway mainline traffic.
Late diverge prohibition	Ingress	• Deploy traffic cones along barrier line extending upstream of exit ramp gore area.	• Reduces congestion at diverge ramp junction caused by motorists attempting to make a sudden lane-change to access an exit ramp. • Improves safety.
Additional exit ramp lane	Ingress	• Cone an additional lane on exit ramps serving traffic destined to an event venue.	• Provides additional ramp storage capacity. • Proves particularly effective if two-lane ramp traffic does not have to merge at downstream end of ramp.

Figure 6-39
Temporary Elimination of Freeway Weaving Area

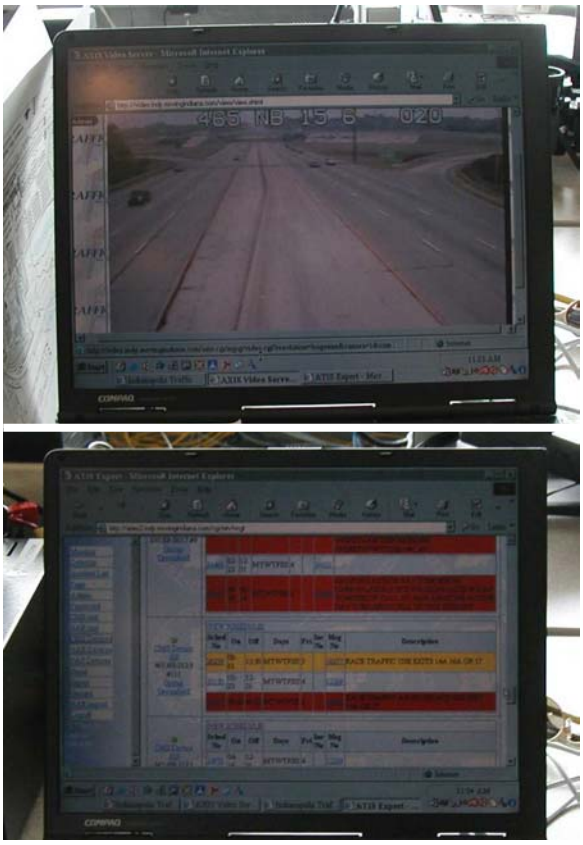

Figure 6-41
Remote Traffic Surveillance and Management

Figure 6-40
Prohibition of Late Freeway Diverge

Figure 6-42
Daily Reversible Lane Operation

Figure 6-43
Daily Contraflow Operation

The application of alternative lane operations to streets during a planned special event creates an express route between an event venue and high-capacity freeway/arterial corridors. For instance, Figure 6-44 shows contraflow operation used during event traffic egress to facilitate rapid clearance of venue parking areas. An alternative lane operation for freeways involves designating an "express lane(s)" for through traffic. Median crossovers at section termini permit access to designated reversible lanes. In order to avoid congestion at the downstream merge point, right-lane traffic diverts upstream of the merge via an exit ramp to another freeway or arterial. Though rare, stakeholders may consider alternative lane operations for freeways or other divided highways in rural areas only.

Figure 6-44
Contraflow Operation during Event Traffic Egress

Table 6-35 lists disadvantages of alternate lane operations on divided highways.

Table 6-35
Disadvantages of Divided Highway Alternative Lane Operations[17]

CONSIDERATION
• Signs, pavement markings, and safety features will not necessarily be visible to drivers traveling in the opposite direction. • Safety appurtenances such as guide rail transitions, crash attenuators, and post support bases have not been designed to provide adequate protection at hazardous locations from the opposite direction of travel. • Outbound contraflow operation prohibits inbound emergency vehicle access. • Drivers will likely find operation confusing. • Nighttime operation is difficult to manage. • Cost to plan, design, and deploy operation is extensive.

Three key elements in developing an alternative lane operations plan include lane balance, markings, and enforcement. Key considerations regarding lane balance include:

- The success of any plan stems from *achieving lane balance* at the downstream terminus of a reversible lane or contraflow section. The number of lanes exiting an alternative lane section should not exceed the number of available receiving lanes at the end of the section. Otherwise, congestion will occur as a result of traffic merging at the section end.
- An alternative lane street section either terminates at a freeway interchange or street intersection.
- To effect lane balance, each lane in the alternative lane section must have a dedicated receiving lane. As a result, select travel lanes may become an exclusive turning lane at the end of the section.
- Temporary signing must inform motorists of lane destinations and restrictions

before they enter an alternative lane section.

The following represent common methods of designating reversible lanes:

- Lane control signals
- Roadside signing
- Physical markings such as traffic cones and movable barriers

Figure 6-45 illustrates the use of lane control signals for temporary reversible lane operation in a roadway construction zone. These signals assist motorists in gaining a clear understanding of the scope of reversible lane operation in effect. Similar lane control signal applications apply to planned special events as well.

Figure 6-45
Temporary Reversible Lane Operation with Lane Control Signals

Reversible lanes require additional enforcement, particularly at section termini. Law enforcement should monitor section operation and ensure drivers maintain a relative safe operating speed. This applies even when the alternative lane section operates congestion-free. If traffic cones delineate travel lanes, then high-speed traffic may strike cones or cause them to blow over.

Management and Monitoring

The management of traffic traversing a local flow route on the day-of-event involves route guidance and monitoring of traffic control initiatives.

Aside from equipment quantity limitations, local street right-of-way and the presence of lateral obstructions may limit the placement of portable CMS at regular intervals along a local flow route to guide drivers. Instead, the event planning team should design special route marker signs for guiding motorists to venue parking areas and pick-up/drop-off locations. Each route marker may consist of a color-coded letter or symbol. Figure 6-46 shows an example route marker sign for a particular special event parking area. When erected along a local flow route, the route marker assemblies collectively trailblaze a route to the drivers' destination of choice. As illustrated in Figure 6-47, signs that introduce each route marker should be placed on all freeway and arterial corridors serving the event venue. The event planning team must design and place all route marker assemblies in accordance with standards contained in the Manual on Uniform Traffic Control Devices. Sign fonts must be legible at free-flow travel speeds.

Figure 6-46
Route Marker Sign

Figure 6-47
Introduction of Route Marker Sign Symbols

The street network surrounding a planned special event venue likely encompasses multiple jurisdictions. In turn, multiple traffic operations and/or law enforcement agencies, representing the local, county, and state level, may participate in street operations control and management on the day-of-event. The event planning team and traffic management team must ensure the traffic control strategies outlined in agency-specific plans complement one another, including contingency actions.

Some larger cities have installed permanent CCTV cameras for monitoring and managing high-traffic arterial operations. Figure 6-48 shows the Daytona Beach, FL TMC that has access to CCTV video for select streets traversing the city. In areas not covered by land-based CCTV, the traffic management team may alternatively utilize aerial surveillance to monitor street operations. The use of law enforcement aircraft allows on-demand surveillance of street corridors. If a TMC and/or event command post can not access video from the aircraft, then the aircraft should carry personnel involved in preparing the traffic management plan. Such personnel can best assess plan effectiveness and transportation system operation at potential problem areas identified during advance planning.

The deployment of a portable traffic management system(s) (PTMS) provides a traffic management team with the capability of monitoring traffic operations at critical roadway system locations in addition to disseminating updated traveler information at that location. Critical locations include target points connecting a corridor flow route and a local flow route or key driver decision points on the street network surrounding an event venue. Figure 6-49 shows a PTMS deployment. Table 6-36 lists typical PTMS components. Wireless communication via spread spectrum radio enables the traffic management team to view full-motion video from PTMS surveillance cameras.

Figure 6-48
Daytona Beach (FL) Transportation Management Center *(Photo courtesy of the Florida DOT.)*

Figure 6-49
Portable Traffic Management System[15]

Table 6-36
Portable Traffic Management System Components

COMPONENT
• Surveillance camera
• Changeable message sign
• Highway advisory radio
• Detection devices
• Weather sensor
• Flood lights
• Power source (e.g., solar)

Intersection Traffic Control

A proactive approach toward developing strategies for controlling intersection traffic during a planned special event aims to:

- Increase intersection traffic handling capacity.
- Improve the orderly movement of traffic.
- Prevent crash occurrences.

The key to maximizing capacity involves simplifying traffic movements and minimizing the number of traffic signal phases. A typical 4-leg intersection has 32 conflict points. After prohibiting all left-turn movements and cross-street through movements, the same intersection has just 4 conflict points. As shown in Figure 6-50, lane channelization limits competing intersection traffic flow which, in turn, facilitates continual flow into a parking area access road or other road segment (e.g., alternative lane section).

Figure 6-51 presents an example, based on an intersection serving a Daytona International Speedway parking area, of achieving intersection turning movement lane balance. The plan shows three competing traffic flows that, with proper channelization applied, have unimpeded access to one receiving street segment. Given four receiving lanes, the channelization limited the number of approach lanes to four. When planning to use traffic cones or other channelizing devices for intersection traffic control, mark-out device locations prior to the event for fast and accurate placement on the day-of-event.

Figure 6-50
Elimination of Competing Intersection Traffic Flow

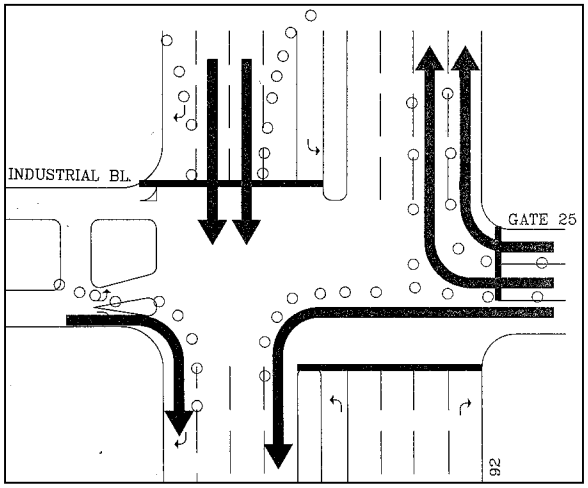

Figure 6-51
Turning Movement Lane Balance[18]

Stakeholders can also reduce the number of competing intersection traffic flow movements by initiating a planned road closure. Figure 6-52 illustrates this tactic, where law enforcement blocked a venue ingress route to facilitate event traffic egress through an intersection.

Advance signing of permitted intersection movements improves the orderly movement of traffic. This particularly applies to cases

when intersection operation on the day-of-event deviates significantly from daily operations. Figure 6-53 shows a high-visibility sign erected over an intersection approach contained in a planned egress route. Advance sign posting allows neighboring residents and local motorists to become familiar with planned day-of-event traffic control.

Figure 6-52
Road Block of Ingress Route to Facilitate Egress

Figure 6-53
Intersection Advance Signing

Traffic control officers have a large role in maximizing intersection operating efficiency. By using positive traffic control, as illustrated in Figure 6-54, officers guide motorists through an intersection. This minimizes headway between vehicles and reduces stops due to driver confusion, particularly at the downstream end of a reversible lane section. The officer commands a driver's attention and works to control the speed of vehicles entering and departing the intersection, thus reducing rubbernecking.

Figure 6-54
Positive Traffic Control

Intersection traffic control changes from event ingress to egress operations. With regard to some street use events, particularly those involving a long event route and/or slow event pace, intersection traffic control complements a system of staged road closures along the event route. Law enforcement escorts the head and tail of the parade or street race. Traffic management team personnel deploy intersection traffic control a certain time (e.g., 15-30 minutes) before the head arrives and restores permitted intersection movements after the event tail clears.

Traffic Signal Operations

The significant change in traffic volume and flow patterns at street intersections in the vicinity of a planned special event venue during event ingress and egress mandates a review of traffic signal timing plans during the event operations planning phase. Except in isolated cases, traffic control officers should not manually control traffic signals on the day-of-event. Field decisions are difficult to make, and a manually controlled signal does not operate on a plan or in coordination with adjacent signals.

Advance traffic signal operations planning involve developing event traffic signal timing plans. Traffic signal timing plans should exist for a range of contingency scenarios that prioritize either major street or minor street traffic movements. Methods to increase time for a specific movement include: (1) selecting an existing plan with a longer cycle length to increase the normal favored phase, (2) implementing a custom plan favoring a minor street phase (3) deploying a contingency "flush" plan, consisting of an extra long phase or cycle, to facilitate movement through a corridor, and (4) increasing time for a movement through manual traffic signal system operator control. In traffic signal system-controlled corridors carrying high traffic volumes on the day-of-event, system operators may enact simultaneous coordination, where all signals within a single corridor turn green at the same time.

A successful traffic signal system management approach for planned special events involves providing a traffic signal system operator with access to real-time CCTV video of intersection operations. Appendix J contains sample protocol for the operation of a centralized traffic signal system, supplemented with permanent CCTV coverage at major intersections, in Anaheim, CA during a permanent venue event.[19] If a real-time communication link to traffic signal controllers exist, then agencies can elect to mount a portable CCTV camera on a traffic signal pole, as shown in Figure 6-55, or other structure for day-of-event monitoring of intersection operations. Real-time monitoring ensures rapid implementation of appropriate timing plans and permits operator manual control as needed.

The traffic management team should include a traffic signal technician, available on the day-of-event for emergency maintenance. Also, the technician could facilitate timing plan downloads in the field, required for isolated signals or in the event that communications with a control center fail. The availability of a roving technician proves effective for making quick changes to traffic signal operations to meet user needs on the day-of-event. Prior to a planned special event, a technician should inspect traffic signals at critical locations, and operators should test traffic signal system control capabilities from the control center.

Figure 6-55
Portable CCTV Camera Mounted on Traffic Signal Pole[6]

Plan Specifications

The event planning team designs traffic control plans for use by the traffic management team and traffic control contractors. Table 6-37 contains a traffic control plan development checklist for freeway, street, and intersection management. Appendix K contains example traffic control plans and maps prepared for various planned special events.[18,20] Because equipment demand varies on the day-of-event, traffic control plans should indicate equipment storage area locations and inventory remaining equipment available.

Table 6-37
Traffic Control Plan Checklist

ELEMENT	PROVISION
Freeway control plan	• Specify maintenance and protection of traffic per MUTCD guidelines (e.g., location of traffic control equipment, equipment quantities, and safety signs). • Indicate ramp control and capacity modifications. • Highlight exclusive traffic flows (e.g., unimpeded merge, etc.). • Dimension weaving area, acceleration/deceleration lane lengths, ramp length. • Indicate potential bottleneck locations for surveillance monitoring.
Street control plan	• Show closed road segments. • Indicate directional lane control (e.g., alternative lane operations). • Show one-way streets. • Indicate number of ingress and egress lanes at each venue access point (e.g., parking areas, pick-up/drop-off points). • Show street use event route. • Indicate parking restrictions. • Indicate location of command post(s). • Integrate with signing plan (e.g., show route trailblazer signs).
Intersection control plan	• Specify maintenance and protection of traffic per MUTCD guidelines (e.g., location of traffic control equipment, equipment quantities, and safety signs). • Show permitted pedestrian movements and crosswalk locations. • Indicate approach lane designations and pavement markings. • Indicate traffic control. • Highlight exclusive/permitted traffic flows (indicate approach lane and corresponding receiving lane). • State special regulations (e.g., turn prohibition, exclusive bus lane, resident/permit only movement). • Show approach closures. • Indicate parking restrictions. • Indicate location of traffic control officers. • Indicate location of equipment storage area at intersection.

Signing plan	• Show location of permanent/portable changeable message signs.
	• Show location of permanent/portable highway advisory radio stations.
	• Indicate CMS/HAR message sets.
	  o Default ingress and egress
	  o Contingency scenarios
	• Show location of temporary static signs and message.
	• Indicate location of dynamic blank-out signs.

Equipment location plan	• State number of traffic cones, drums, and barricades required at designated locations. o Indicate equipment staging areas (e.g., shoulder, median, intersection corner) • Indicate location of equipment storage areas.
Other considerations	• Provide plans for both ingress and egress operation. • Indicate roadway construction zones. • Include table of quantities. • Show aerial map. • Draw map to scale. • Display landmarks.

EN-ROUTE TRAVELER INFORMATION PLAN 

Overview

The dissemination of traveler information for a planned special event is an integral part of operating and managing the transportation network. The following three issues must be considered in developing and maintaining the event plan:

- **Stakeholders** – The information needs of travelers extend well beyond an agency's infrastructure and include other jurisdictions' highway facilities, transit facilities, airports, etc. The private sector should also be an active partner in the traveler information process and must be included as a stakeholder.

- **Evaluation** – Care should be taken not to overestimate the benefits achieved by the implementation of information dissemination components in the plan. Specifically, it is important to recognize that travel patterns are quite dynamic and that some drivers will divert naturally when they encounter congestion regardless of whether or not they receive information beforehand about that congestion. A Washington, D.C. Advanced Traveler Information Systems (ATIS) study revealed:
  - *If ATIS deployments are evaluated purely on time-savings, the benefits of ATIS will likely be grossly underestimated.*
  - *ATIS users value improved travel reliability. The value of improved on-time reliability is not easily nor directly monetized, but it is clear that many types of travelers can benefit from ATIS.*
  - *Improved reliability and predictability of travel are also likely good surrogates for reduced driver stress. From this common sense perspective, it is clear that the benefit of improved travel reliability and predictability from ATIS will outweigh whatever small return is generated from the monetization of aggregate travel time reductions*.

- **Performance Measures** – In order to assess the extent to which the traffic management plan efforts within are meeting goals and objectives, a set of performance criteria and measures-of-effectiveness pertaining to these efforts must be identified. Relative to coordination and information dissemination, performance criteria have three different, yet interrelated, dimensions that are of interest:

  - Information credibility – An information dissemination tool must be credible to travelers if it is to be utilized and have an impact upon traffic operations. The following criteria define how credibility is established: (1) the information must be accurate, (2) the information must be timely, and (3) the information must be relevant to its intended audience.

  - Market penetration – Market penetration refers to the percentage of the potential audience reached by the information dissemination efforts. Performance criteria regarding market penetration may be appropriate for evaluating certain system goals and technologies, particularly those emerging as part of ATIS. It is expected that some technologies, such as in-vehicle dynamic route guidance, will require only limited market penetration in order to achieve operational benefits. Other

operational benefits. Other technologies, such as information kiosks in major traffic generators, may require agencies to strive for as great a market penetration as possible in order to distribute the information to a wider audience and possibly attract private sector advertising and sponsorship.

- Traveler response – Ultimately, the purpose of providing information to travelers is to effect some change in traveler behavior that will cause an improvement in safety or operations. Thus, performance measures are also needed to determine the extent to which information dissemination accomplishes this purpose. Changes in traveler mode, departure time, and route (if appropriate) are appropriate for evaluating the effectiveness of real-time, travel-related information. However, it may be very difficult and expensive to obtain actual data for these measures. Traveler opinions about the effectiveness of the information being provided can be another important evaluation measure.

- It is important to recognize that because of the complex travel patterns of travelers at any point in the roadway, it may not be possible to adequately measure the overall effects of many types of information or dissemination modes upon traffic volumes, speeds, or delays. The day-to-day variances in travel patterns themselves may mask the effects of any information disseminated during a specific event such as an incident, particularly if the information is intended for a very specific audience (such as vehicles within a traffic stream destined for a specific downstream exit).

Information Needs

En-route traveler information can provide event patrons and other transportation system users with current roadway and transit information while traveling en-route. Information is typically provided via devices deployed along the side of the roadway, or from devices mounted on the dashboard of the vehicle. Along the roadway, changeable message signs and highway advisory radio messages typically provide information regarding an upcoming planned special event, including current conditions related to the special event such as traffic congestion, incident and construction locations, weather advisories, parking availability, and alternate routes. In-vehicle and personal mobile devices can provide a variety of en-route traveler information to both the traveler as well as transportation providers. Sophisticated route guidance systems can assist motorists in route planning as well as providing timely directions via a computer synthesized voice.

Static Signing

Static signs can be used for event management to inform travelers of an upcoming planned special event, to identify park & ride lots, and to guide motorists to particular locations. It is not uncommon for agencies to use static signing in special event management for the following purposes:

- Notify travelers of a future special event.
- Notify travelers of future facility changes for the event such as lane closures or occupancy restrictions.
- Identify special alternate routes for the event.
- Guide travelers to parking or park & ride lots.

Transportation incident responders utilize static signing in day-to-day operations to trailblaze motorists along an alternate route

or venue access route. These are temporary signs, mounted on fold-away supports, along the shoulder of the roadway or at exit gores to direct motorists to alternate routes as a matter of typical traffic management or in response to an incident and redirecting of traffic.

Changeable Message Signs

One of the most fundamental technologies available for disseminating traffic-related information from the roadside is that of changeable message signs. CMSs are sometimes referred to as dynamic message signs or variable message signs. CMSs are programmable traffic control devices that can usually display any combination of characters to present messages to motorists. These signs are either: (1) permanently installed above or on the side of the roadway, (2) portable devices attached to a trailer, or (3) portable devices mounted directly on a truck and driven to a desired location. Portable CMSs are much smaller than permanent CMSs and are oftentimes used in special event situations, highway work zones, when major crashes or natural disasters occur, and emergency situations.

When installed, CMSs become a part of the total motorist information system. Thus the information presented on CMSs and the placement of the signs must be consistent and compatible with static signs. Highway signs – both static and dynamic – must project a message so that the driver can:

1. Detect the sign,
2. Read and understand the sign,
3. Make appropriate decisions based on the information gained from the sign, and
4. If necessary, initiate a control response, and complete the required maneuver.

CMSs perform a critical role in special event management. Such signs can furnish motorists with real-time information that advises them of a problem and in some cases, a suggested course of action. CMSs are also used to improve motorist safety and reduce traffic congestion and delay during events. CMSs can be used to manage traffic by displaying the following types of messages:

- **Early warning** messages give motorists advance notice of slow traffic and queuing ahead and are effective in reducing secondary crashes. When used in freeway work zones, early warning messages also give notice of new detours, changes in alternate routes, changes in lane patterns, special speed control measures, etc.

- **Advisory** messages provide motorists with useful information about a specific problem along their route. This information allows motorists to change their speed or path in advance of the problem area, or may encourage them to voluntarily take an alternate route to their destination.

- **Alternate route** messages influence motorists to travel to their chosen destination by using different routes than originally intended. The alternate route is one designated by the transportation agency. In cases when the freeway is physically closed as a result of construction, crash, or natural disaster, the motorists are notified that an alternate route *must* be used.

The most critical locations for installing permanent CMSs are in advance of interchanges or highways where drivers have the opportunity to take some action in response to messages displayed on CMSs. In many special event cases, permanent CMSs are already strategically located to advise event patrons of special conditions and non-event motorists of alternate bypass routes. Figure

6-56 shows a permanent CMS over an arterial located adjacent to a stadium venue and serving venue parking areas.

Figure 6-56
Permanent CMS Over Stadium Access Road

A CMS should not compete with existing roadway signs. In general, a CMS should be *permanently installed* at the following locations:

- Upstream from major decision points (e.g., exit ramps, freeway-to-freeway interchanges, or intersection of major routes that will allow drivers to take an alternate route)
- Upstream of bottlenecks, high-accident areas, and/or major special event facilities (e.g., stadiums, convention centers)
- Where regional information concerning weather conditions such as snow, ice, fog, wind, or dust is essential

Portable CMS

The use of trailer-mounted CMSs provides an agency with a great deal of flexibility. The signs, which are typically much smaller than permanent, over-the-road CMSs, are used most commonly for temporary applications. As such, portable CMSs are very suitable for special event management. They are usually diesel- or solar-powered and use wireless (cellular) communications to a central management point, making them a very attractive and flexible tool.

Portable signs are usually located at the side of the road and do not sit as high as an overhead sign, which can impair drivers visibility. Most are 3-line, 8 or 9-character signs, and although most have the capability of displaying multiple phases, they tend to be used with simple short messages to allow drivers to read and comprehend the message.

Highway Advisory Radio

Although not as widely used as changeable message signs, highway advisory radio is another means of providing highway users with information in their vehicles. Traditionally, information is relayed to highway users through the AM radio receiver in their vehicles. Upstream of the HAR signal, users are instructed to tune their vehicle radios to a specific frequency via roadside or overhead signs. Usually, the information is relayed to the users by a prerecorded message, although live messages can also be broadcast.

Highway advisory radio is an effective tool for providing timely traffic and travel condition information to the public. It has various advantages and disadvantages. Its most important advantage is that it can reach more travelers, or potential travelers, than the other roadside technology, changeable message signs. While CMSs reach only those motorists at a particular point, and can only convey a short message, HAR has the advantage of being able to communicate with any person in the HAR broadcast range. Furthermore, the amount of information that can be conveyed to the user is much greater. Its primary disadvantage is that it is restricted to low power, and this can lead to poor signal quality (since many outside

forces affect the signal, such as weather) and, therefore, poor listener levels.

HAR is an element of the Federal Communication Commission's (FCC) Traveler Information Systems (TIS) designation. They are permitted under strict FCC guidelines and regulations associated with technology and operations. They are licensed as a secondary user, which means simply that they cannot interfere with a primary user, i.e., a commercial broadcast station. As a secondary user, HAR broadcasts are restricted in signal strength, a level that limits their transmission range to no more than three or four miles from the transmitter. A number of technologies are available for HAR transmission, using both AM and FM bands.

Typically, HAR has been implemented using 10-watt AM transmitters. This is because, beginning in 1977, it was the only technology permitted by the FCC for traveler information. As such, this technology implementation has also proven to be the most effective. Other means involve very-low power AM transmission, where multiple transmitters are spaced closely together to form a large area of coverage. This application, however, has not proven very successful. As late as 2000, the FCC ruled to allow the use of low-power FM transmission for TIS. This technology has limited application to-date.

Urban areas typically present a unique set of challenges to HAR application, which can hinder downtown event management. Tall buildings present an obstacle to uniform transmission since the FCC restricts antenna height to approximately fifty (50) feet. High-power electric lines can incur noise on the transmission that negatively impacts broadcast quality.

Deployment Strategies

HAR can be broadcast in two ways: Point or Wide-Area coverage.

- In Point broadcast, a single transmitter is used to broadcast over a given area. This is typically used at diversion points in advance of areas of recurring congestion to notify motorists of queues and congestion. This type of implementation is popular with travelers because the information is specific to them. This is the most common application for HAR, and it typically utilizes 10-Watt transmitters. It is the simplest to manage in terms of equipment to maintain.

- Wide Area Broadcast transmits a signal to a larger coverage area using multiple synchronized transmitters. This is an effective strategy when a single message is applicable to a large coverage area and the coverage area is sufficiently large for a motorist to hear the longer message length. The fact that a long single message, that is pertinent to specific travelers for only a part of the message, is indeed a disadvantage. Studies have shown that travelers want brief, specific information, pertinent to their location and situation. They are not likely to listen for long periods of time until their information is broadcast. Technically, synchronization is difficult to accomplish between transmitters because both the time and repeated voice signal must be in sync.

Both of these applications are practical and viable for planned special event management.

Portable and Mobile Systems

Portable systems permanently installed on trailers and mobile systems installed on service or maintenance vehicles can be of value in providing timely dissemination of infor-

mation to motorists during short-term deviations from normal highway conditions, or more specifically, during planned special events. These systems can be solar powered, generator powered, or battery powered.

Portable and/or mobile systems could be set up at decision points where a route guidance system directs motorists to an alternate route. This will increase motorist comfort level by reinforcing their confidence that they are following the alternate route instructions correctly.

HAR signs, indicating the frequency at which traffic information is available, are typically installed throughout each zone. These signs usually include flashing beacons that are activated only when a message of some predetermined level of importance is being broadcast and a legend reading (or similar) "TRAFFIC ALERT WHEN FLASHING." This technique permits the system to continuously broadcast "default" messages in each zone during non-congestion periods, while alerting the motorist to an urgent/emergency message by turning on the flashing beacons. Thus the system prevents motorists from tuning to the HAR frequency only to hear the default message time and time again, situations that could negatively impact system credibility.

Changeable message signs can also be used to alert the motorist to the broadcast of a message of the utmost importance. These signs can be controlled through phone lines, or with cellular or paging technology, and can be solar powered with battery back up. They offer a great deal of flexibility, by allowing only the pertinent signs to be activated. For instance, while two signs (one in each direction) may be associated with a particular transmitter, only one would be activated for a downstream incident, thereby eliminating any loss in credibility due to providing a message that is not applicable to one of the directions of travel.

Media

The public has learned to depend upon the media to provide them with "almost" real-time traffic information. Commercial radio has proven to be a good means of providing travelers with traffic information both in and out of their vehicles. Traffic and roadway condition reports have become standard programming items on many commercial radio stations. Commercial radio has the best potential of reaching the greatest number of commuters, since most of them have radios in the vehicles they drive to and from work. It is not uncommon for planned special event stakeholders, including public agencies, to partner with a commercial radio station (or for a commercial radio station to sponsor a special event) to enhance the information dissemination related to the event and its transportation conditions. Care should be taken to ensure that the information disseminated reflects current traffic conditions and is credible.

Other Technology Applications

Other technology applications include:

- Cellular telephone-based systems
- 511
- In-vehicle displays
- Subscription services
- Personal data assistants

Telephone Based Traveler Information

An in-vehicle communication technology that has seen dramatic growth in the past few years is cellular telephones, which gives the motorist the ability to call special "hot-line" systems for traffic information from within their vehicle. Originally, these systems allowed motorists and transit users to call for information to assist in pre-trip decisions from their homes. Information can

now be accessed en-route via cellular telephone, and decisions can be made whether to alter travel routes. The creation of call-in systems has been a popular traffic impact mitigation strategy for many major urban freeway reconstruction projects in recent years.

This type of in-vehicle communication has the advantage over HAR of giving the motorist some control over the type and amount of information he/she wants to obtain through the touch-tone menus. In addition, it is also possible to generate two-way communication between the motorist and the information source.

Recommendations for establishing cellular telephone-based systems include the following:

- The call must be toll-free to users.
- The telephone number must be easy to remember and dial.
- The information must be concise.
- If a menu system is used, a long and tedious menu selection process should be avoided.
- A sufficient number of telephone lines should be provided to prevent the majority of users from receiving a busy signal.
- If a system is going to be used to gather information from users, there must be a method of ensuring the accuracy of the incoming information.
- "Official" use of tipster information should include procedures for verifying that information.
- If incident information is to be received, a human operator is recommended so that secondary questions can be asked to clarify confusing or unclear reports.

As with HAR systems, this technology also requires action by the motorist to access information. There are also significant operating costs associated with this technology, as any calls made using cellular telephones must be paid for by either the motorist, or a public agency, or else absorbed by the corporation providing cellular telephone communication capabilities in the region. Finally, there is some concern that cellular telephone usage while driving may degrade motorist attention and operating capabilities. Manufacturers have developed "hands-free" telephones that allow motorists to listen and talk without holding the telephone receiver, although the need to push the telephone buttons to go through a menu of information operations can defeat the "safety" purpose behind hands-free devices.

Many metropolitan areas established cellular "hotlines" for motorists to call in and report traffic incident information to the highway agency. Examples included #77 and *SP. However, the establishment of the 511 national traveler information number is envisioned to replace these already established numbers.

511

Understanding the importance of consistency and simplicity in providing telephone-based traveler information, in 1999, the U.S. Department of Transportation (USDOT) petitioned the FCC to designate a nationwide three-digit telephone number for traveler information. This petition was formally supported by 17 state DOTs, 32 transit operators, and 23 Metropolitan Planning Organizations and local agencies. On July 21, 2000 the FCC designated 511 as the national traveler information number.

Simply put, 511 represents an abbreviated three-digit dialing code that is a short cut to a ten-digit telephone number for obtaining traveler information from a telephone. In petitioning the FCC, USDOT had to demonstrate the need and benefits for such a number. To that end, the USDOT identified the following:[21]

Further benefits are realized. 511 puts a "face" on ITS and transportation operations, while increasing attention on the potential for traveler information services. With 511, transportation agencies can offer easier access to information via telephone, and have the same number work in multiple places. It is not uncommon for traveler information numbers to change across jurisdictional boundaries, creating confusion among motorists.

In-Vehicle Displays

A video display terminal (VDT) mounted in the dashboard is another form for communicating with motorists in their vehicles. This is primarily a private sector industry, which has not been used widely for information distribution. These systems can be used to provide motorists with route guidance and navigational information in one of two different formats. One approach is to present the driver navigation and route guidance information in the form of maps or equivalent displays. With these systems, a global picture of the traffic network can be provided. Recommended routes can be highlighted on the video map display as well. In another approach, simple symbolic signals (e.g., arrows, text instructions, or a combination of both) guide the driver along a recommended route. Some prototype systems use a variety of displays depending upon whether or not the vehicle is in motion, the functions selected, and level of informational and navigational displays available.

In-vehicle VDTs offer a number of advantages over available technologies in providing information to motorists while driving. These include the following:

- Travel information is more readily accessible to the driver (providing continuous access to current position, routing, and navigational information).
- Computer-generated navigational maps and displays are logical extensions of traditional forms of providing drivers with route guidance and navigation information.

Information can be displayed in text, graphics, or both and tailored to the needs and desires of each motorist. There are also limitations to in-vehicle VDTs. These include the following:

- Drivers have to take their eyes off the roadway in order to receive the information.
- In-vehicle VDTs present the driver with complex maps and diagrams that may create a potential to overload the driver with too much information.
- VDTs may also add to the visual clutter already inside the vehicle.

As technology continues to improve, the Head-Up Display (HUD) has become another alternative to in-vehicle VDTs for presenting visual navigational and route guidance information to motorists. Although originally developed for the aviation industry, several automobile manufacturers are beginning to develop HUDs for presenting vehicle status and navigational information to drivers.

A wide variety of options for displaying information may be available using HUDs. Through both icons and alphanumeric text, navigation and route guidance information may be projected directly into the driver's field of view. This is expected to reduce the need for visual scanning between two information sources (the inside instrument panel and the outside environment) and the associated visual accommodation time.

Subscription Services

A number of private providers supply traveler information services on-demand as a subscription. Most notably, General Motors' (GM) OnStar is a 24 hours a day, 7 days a week motorist assistance system installed in the vehicle. It provides a wide range of services to the driver, including concierge service, telephone service, remote unlocking of the car, and notification of airbag deployment just to name a few.

Another feature OnStar provides is route guidance to motorists. Here, the motorist initiates a call from a button installed in the car, is connected to a live Onstar operator, and proceeds to ask for directions. The operator knows the vehicle's location through OnStar's automated vehicle location system and provides directions for the fastest route. OnStar currently uses a third-party wireless analog network and is moving to a digital technology, which will allow the service to be expanded to handheld devices as well. Presently, 53 current (2003) vehicle models are offered with OnStar, and GM intends to expand to 60 models by the end of 2003. Routing assistance is the most utilized service, and OnStar reports that it handles more than 220,000 routing calls per month.[(22)]

Personal Data Assistants

Personal Data Assistants (PDAs) are the next higher level of sophistication in both off and on-roadway information dissemination technology. PDAs are computer products that have enough power to support applications such as time management and handwriting recognition. By adding radio frequency (RF) communications technology, PDAs allow users to interact directly with travel information systems. This interaction allows users to obtain route planning assistance, traffic information broadcasts, and other pertinent information. Through keypad entry, the user can log on to the information system, request pertinent information, and then log off. PDAs offer the user increased communication and information transmission/receiving power over alphanumeric pagers.

Plan Specifications

An en-route traveler information plan must be developed in concert with the traffic flow plan and traffic control plan. The success of any traffic management plan depends on disseminating correct information to motorists at the right time and location.

Items to be included in this plan include:

- Names of contact person(s) for each involved partner
- Protocols and methods to be utilized to coordinate
- Definition of each partner's responsibilities regarding control and information exchange

Detailed plans are necessary that identify the facilities and resources to be used. For instance, what permanent CMS or HAR are to be used and what holes exist in the information dissemination strategy? Where will portable devices be required? Traveler information plans must include planned message sets for equipment and technology used to disseminate en-route traveler information, including static signs, changeable message signs, highway advisory radio, and telephone information systems.

As in the desktop exercise and modeling analyses, various scenarios must be examined, and as a result, specific tactical strategies will be developed. Of particular importance in planned special event management is the creation of information messages for the various devices available to the manager. This includes changeable message sign messages, highway advisory radio messages,

Internet and PDA messages. Each of these must be developed for various scenarios, including contingency ramp closures, full parking lots, and emergency situations. The traveler information plan may also specify protocol for disseminating traveler information via the media.

TRAFFIC SURVEILLANCE PLAN

A traffic surveillance plan can include:

- Closed-circuit television systems
- Field observation
- Aerial observation
- Media reports

Closed-Circuit Television Systems

Closed-circuit television systems have been used for many years to provide visual surveillance of the highway network. Control centers typically use CCTV systems for the following purposes:

- Detection and verification of incidents
- Monitoring traffic conditions
- Monitoring incident clearance
- Verifying message displays on changeable message signs

For fixed location CCTV systems, video cameras are permanently mounted either on existing structures along the roadway or on specially installed camera poles. This type of system consists of various components, including the following:

- Video camera unit
- Mounting structure (existing or installed)
- Controller cabinet housing the control equipment
- Communication system connecting camera to control center
- Video monitors and camera controls located in control center

CCTV systems allow operations personnel to visually monitor sections of roadway and to react directly to the actual conditions on the roadway. Since operators can lose interest if required to constantly view CCTV monitors, and may fail to notice incidents immediately after they occur, current systems are being designed to automatically position cameras at suspected incident locations (as signaled by incident detection algorithms) and to alert the operator.

Portable CCTV Systems

Portable CCTV systems can serve several purposes including the following:

- Short-term traffic monitoring in areas with non-recurring congestion (e.g., corridor serving a planned special event venue, work zone, critical incident, detours, etc.)
- Traffic monitoring at special traffic generators for planned special events
- Traffic monitoring along evacuation routes
- Determination of optimum camera location for fixed location CCTV systems

Portable CCTV systems are typically mounted in a light truck or van or on a trailer. Components of a portable system include the following:

- Camera with pan-tilt-zoom capability
- Telescopic boom
- Television monitor
- Video recorder
- Camera control unit for controlling pan, tilt, and zoom functions
- Generator for powering equipment; or battery power with solar charging
- Air compressor for operating telescopic boom

- Wireless communications (It should be noted that during planned special events, cellular capacity is strained, and as such, there is a risk of failing communications to portable surveillance systems with cellular communications.)

Figure 6-57 shows a portable CCTV camera, mounted on an overhead sign structure, used for freeway surveillance during a planned special event.

Figure 6-57
Portable CCTV Camera for Freeway Surveillance

Temporary CCTV camera installation requires consideration of video image transmission, and limited communications options may exist. Telephone lines and cellular channels facilitate the transmission of compressed or slow scan video. The transmission of real-time motion video requires infrastructure such as fiber optic cable, coaxial cable, or wireless (e.g., spread spectrum radio).

Closed-circuit television surveillance is a very valuable planned special event management tool for observing real-time conditions related to special event corridors, alternate routes, parking and pedestrian conditions, as well as for a verification tool for messages placed on changeable message signs.

Field Observation

A common and efficient technique to observe the traffic conditions during a planned special event is to place human observers, or detectors, in the field, usually at critical locations. Normally, these observers have the role of monitoring conditions and reporting back to a central location for strategic assessment. These human detectors are gathering relevant information related to the event and using established protocol to communicate the information back to the central processing and coordination facility.

It is common to deploy these observers where technology is lacking and where they may perform an additional role in traffic management or traffic incident management (e.g., freeway service patrol operators). For instance, an observer may be placed at a critical pedestrian location, where besides reporting back to central command on the status of the location, the observer may serve the role of a traffic engineer by adjusting the signal timing to better accommodate the pedestrian volumes.

Aerial Observation

Aerial surveillance has long been used to monitor the operation of the surface transportation network. "Observers" in aircraft (fixed wing or helicopters) fly over freeways and streets and monitor conditions in real-time, using two-way radios to communicate with the TMC or with service patrols on the freeway. This approach can be relatively expensive when one considers the expense of leasing or operating an aircraft, although it does have the benefit of being able to cover a large area.

An emerging trend is the use of remote sensing via *unmanned* aerial vehicles, similar to airborne platforms/drones used by the military, and satellites. Information gathered

from satellite, aircraft, and unmanned aerial vehicles can be used to estimate arterial and freeway traffic characteristics over long time scales and large geographic areas, including those where data were previously unavailable. The spatial coverage provided from air- and satellite-based sensors can potentially support the development of new metrics that better represent highway utilization and congestion.

Media Reports

As discussed earlier, the media needs to be a partner in the planned special event management and operations effort. Agreements must be in place that define their role within the plan, as well as what information needs to be communicated, both prior to and during the event.

The primary disadvantage of using the media relates to the accuracy of the information. Traffic reports often are transmitted only when normal scheduling permits. This may cause considerable time delays between when a condition changes and when the media reports it. Often, many problems go unreported or are cleared by the time they are reported on the radio and television. The accuracy of the information provided by commercial radio, for instance, is a function of the time between the broadcaster's last communication with the incident reporting source and the number of incidents that have occurred and/or have been cleared during that time.

Some transportation agencies have made substantial efforts to improve coordination and cooperation between themselves and the media traffic reporters. For example, some agencies allow private traffic advisory services to place personnel in the TMC to obtain information on traffic conditions and expected agency responses in an accurate and timely manner.

TRAFFIC INCIDENT MANAGEMENT AND SAFETY PLAN 

Overview

The occurrence of a planned special event that increases or disrupts the normal flow of traffic places a premium on the optimal use of existing facilities. A traffic incident and safety plan specifies crash prevention tactics and traffic incident quick clearance initiatives, some of which denote special provisions enacted just for the day-of-event. These traffic incident management techniques preserve two goals of managing travel for planned special events: (1) ensuring safety and (2) maximizing efficiency. In the event of a major traffic incident that blocks travel lanes for a prolonged duration, the traffic management team should refer to response procedures and guidelines contained in an established traffic incident management manual for the region.

Crash Prevention Tactics

Crash prevention tactics focus on improving driver awareness of surroundings and driver behavior. Table 6-38 lists crash prevention tactics applicable to planned special events.

Table 6-38
Crash Prevention Tactics

TACTIC
• Portable lighting • Congestion warning sign • Public information safety campaign • Enforcement

Portable Lighting

Portable lighting devices enhance driver understanding of traffic control and traffic flow patterns at night. As shown in Figure 6-58, the devices prove particularly useful at rural,

unlit freeway interchanges or arterial target points that handle high-volume turning movements during event ingress and egress. Portable lighting makes traffic control officers more visible to approaching drivers, and in the vicinity of the event venue, the devices can spotlight pedestrian/vehicular conflict areas.

Figure 6-58
Portable Lighting *(Photo courtesy of the Wisconsin DOT.)*

Congestion Warning Signs

Congestion warning signs, placed upstream of known roadway bottleneck locations, alert drivers of demand-induced congestion on the day-of-event. The tactic aims to prevent rear-end crashes as a result of drivers encountering unexpected congestion. Stakeholders should strongly consider deploying congestion warning signs along event ingress and egress routes containing significant geometric curves. In order to control message display and preserve its credibility, consider deploying portable changeable message signs or static signs that hinge open, as shown in Figure 6-59.

Public Information Safety Campaign

A public information safety campaign strives to change motorists' behavior when traveling to and from a planned special event. Campaigns emphasize event traffic control and regulations, pedestrian safety, and vehicle operation. For example, the Louisiana DOT launched a $94,000 public information campaign in 2002 to reduce the number of crashes caused by drivers following too closely.[23] The campaign targeted spectators attending Louisiana State University football games through advertisements on radio stations carrying the games and advertisements in game-day football programs. The advertisements specified driver tips on how to avoid tailgating.

Figure 6-59
Congestion Warning Sign

Enforcement

Enforcement aims at preventing drivers from executing illegal and dangerous movements in an effort to bypass congestion and/or day-of-event traffic control. For instance, drivers attempting to access a freeway may travel past a congested entrance ramp serving egress traffic, make an illegal U-turn, and traverse an uncongested freeway entrance ramp from the opposite direction. The behavior of one motorist provokes other motorists to execute the same maneuver.

Service Patrols

Service patrols function to typically satisfy the incident detection, verification, response, and removal components of incident management in the event of a minor incident,

such as a vehicle disablement or property-damage-only crash. Patrol operators strive to identify and remove debris or hazards impeding traffic flow, and they aid in the fast removal of immobilized or wrecked passenger cars blocking one or more travel lanes. Service patrol programs create a sense of security for motorists in addition to improving public relations for the service's sponsor. Other examples of motorist assists that are typically offered free of charge include supplying fuel, changing flat tires, providing a jump-start, and calling private towing companies.

Service patrols can play a key role in traffic incident management for planned special events. The service has great versatility, and patrol operators can satisfy a wide range of traffic management team needs. For example, operators can assist in establishing day-of-event traffic control, performing traffic surveillance, and providing timely traffic condition reports from various remote locations. As shown in Figure 6-60, service patrols carry equipment to support traffic management at incident sites and congestion locations.

Table 6-39 indicates considerations in preparing a service patrol operations plan for a planned special event. To avoid having drivers abandon disabled vehicles or risk exposure to adjacent traffic flow, stakeholders should alert roadway users of service patrol operation on the day-of-event via roadside traveler information devices. Figure 6-61 shows a special event HAR message disseminating safety tips to drivers and promoting service patrol operation.

Figure 6-60
Service Patrol Vehicle *(Graphic courtesy of the Minnesota DOT.)*

Table 6-39
Service Patrol Operations Considerations

CONSIDERATION
• Number of service patrols deployed • Time of operation • Patrol routes and/or staging location • Storage of towed vehicles • Operator communication with TMC or event command center

Figure 6-61

THIS IS TRIMARC WITH A SPECIAL TRAFFIC ANNOUNCEMENT FOR SATURDAY MAY 4TH. WELCOME TO LOUISVILLE ON DERBY DAY. THE RACES ARE NOW ENDING. EXPECT HEAVY AND SLOW MOVING TRAFFIC ON I-264 AND I-65. BE PREPARED FOR SUDDEN STOPS.

IF YOU EXPERENCE CAR PROBLEMS, REMAIN WITH YOUR VEHICLE AND RAISE THE HOOD. THERE ARE SERVICE PATROL VANS ON THE INTERSTATE TO PROVIDE FREE ASSISTANCE.

Highway Advisory Radio Traveler Safety Message[24]

Traffic Incident Quick Clearance Initiatives

Quick clearance is the practice of rapidly and safely removing temporary obstructions from the roadway.[25] Quick clearance practices increase the safety of traffic incident responders and victims by minimizing their exposure to adjacent passing traffic. A reduced probability of secondary incidents accompanies decreased congestion levels resulting from fast removal of lane-blocking obstructions.

A quick clearance practice consists of laws, policies, procedures, and infrastructure aimed at effecting the safe and timely removal of a traffic incident. Service patrols, as previously described, represent a quick clearance infrastructure component. Rapid clearance of traffic incidents during planned special event ingress and egress avoids significant impact to corridor and local traffic flow routes in addition to routes used by participants and VIPs.

The following quick clearance initiatives benefit traffic incident management in high-volume corridors, characteristic of planned special events: (1) vehicle/cargo removal laws and policies, (2) stakeholder open roads policy, and (3) public-private towing contracts. Vehicle removal laws require drivers to immediately move vehicles obstructing travel lanes. Also, agencies have authority to aggressively clear vehicles and spilled cargo without incurring unnecessary delay. Similar policies establish no stopping zones in highly traveled locations. An interagency open roads policy informs traffic incident responders of the urgent need to rapidly remove disabled or wrecked vehicles, spilled cargo, and debris that obstruct the normal flow of traffic, and the policy disseminates key guidelines to ensure a cooperative incident removal effort between agencies. Chapter 5 discusses contract towing service for planned special events.

Practitioners should consult NCHRP Synthesis 318, *Safe and Quick Clearance of Traffic Incidents*, for state-of-the-practice information about laws, policies, procedures, infrastructure, and technologies associated with developing a quick clearance practice and increasing the efficiency of traffic incident removal operations.[25]

Quick clearance represented the overarching theme within the Utah DOT traffic incident management plan for the 2002 Winter Olympics. Table 6-40 summarizes some notable quick clearance strategies contained in the event traffic incident management plan. The table also states statistics and performance measures that conclude the Utah DOT, together with its partner law enforcement and transportation agencies, developed and deployed a successful quick clearance practice for the Olympics.

Table 6-40
Traffic Incident Quick Clearance for the 2002 Winter Olympics[26]

STRATEGY
• Staging of heavy-duty tow trucks throughout Olympic venue routes between 5:00 AM and 1:00 PM (ingress). • Carrying of kits by incident responders to tow every type of bus used to transport people. • Use of photogrammetry by law enforcement during incident investigations. • Deployment of heavy service patrol coverage to reduce the number of abandoned vehicles and lessen security concerns.
EVALUATION STATISTIC
• 29 vehicles were removed from incident scenes on the athlete routes to facilitate traffic flow. • 12 fatality or critical crashes were investigated by law enforcement using photogrammetry in under one hour, and in one case, police shot an incident scene with evidence markers within 30 minutes. • A serious injury crash was cleared in 23 minutes because of excellent teamwork. • Incident Management Team crews spent an average of 70 minutes at each crash scene during the Games, down from an average of 115 minutes prior to the Games. • 2,306 motorists were assisted during the 17 days of the Games.

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CHAPTER SEVEN
TRAVEL DEMAND MANAGEMENT AND TRAVELER INFORMATION

Figure 7-1
Planned Special Event Express Bus Service from Park and Ride Lot

PURPOSE

This third chapter on event operations planning reviews strategies for: (1) mitigating the travel demand impacts of planned special events and (2) ensuring the transportation system operates as efficiently as possible on the day-of-event. Successful strategies are presented in three sections that influence travel choice utility; *travel demand management*, *transit service*, and *pre-trip traveler information*. These initiatives enhance transportation system operations and improve customer service for all users by utilizing all available system resources and excess capacity. The identification and successful promotion of travel demand management initiatives can reduce traffic demand and, in turn, improve system efficiency and travel time reliability.

INTRODUCTION

Travel Demand Management (TDM) represents a key component of the overall advance planning process when forecasted traffic demand levels approach or exceed available road capacity. TDM strategies may be warranted for planned special events occurring during peak travel times, continuous events located in downtown areas, street use events of long duration, regional/multi-venue events, and special events in rural areas having limited transportation system capacity. The goal is to optimize event patron

and non-attendee travel through incentives aimed at consolidating person trips and altering user travel patterns and habits, while minimizing any penalties to the user.

Transit service for a particular planned special event includes: (1) public transit service expansion or modification, (2) express buses from area neighborhoods or park and ride lots, and (3) charter bus service from other cities and counties. These services, though configured to net operators a profit, represent a travel demand management initiative. The goal of transit operators involve designing a special event service and related incentives to not only improve the travel choice utility associated with using transit, but also to exceed the utility (e.g., travel time, parking fees, comfort, etc.) associated with traveling via personal automobile. Successful transit services collectively may result in a significant change in event patron modal split without impacting service to non-attendee users.

The availability of pre-trip travel information, consisting of essential event operations and real-time traffic information, proves effective in assisting event patron evaluation of potential travel options, trip departure times, and travel routes to the event venue. Similarly, other road users, seeking to minimize event-related impacts to their trip, value this information.

TDM, transit, and pre-trip traveler information initiatives complement one another and work to reduce traffic on the roadway network in the vicinity of the event. These initiatives are not infrastructure improvements to increase capacity, but rather are methods that decrease vehicular traffic by providing event patrons with various travel choices as well as providing information that may lead to a reduction in traffic volumes. Some of these strategies are implemented by: (1) the public agency involved with the special event, (2) the event planners themselves, and (3) a combination of both groups.

TRAVEL DEMAND MANAGEMENT

Overview

TDM strategies are used to maximize the efficiency of the transportation system, thus reducing the volume of traffic on the roadway and minimizing the peak demand rates that cause congestion. They do not represent infrastructure improvements to increase capacity, but rather are methods that cause traffic demand reduction by encouraging other travel mode choices, particularly for event patrons. As shown in Table 7-1, TDM techniques for planned special events involve two distinct groups.

Table 7-1
Travel Demand Management Goals

USER GROUP	TRIP PURPOSE	TDM GOAL
Event patrons	• Traveling to the event itself	• Encourage the use of travel modes other than personal automobile. • Encourage a shift in arrival and departure times to reduce peak traffic volumes. • Increase vehicle occupancy.
Non-attendee road users	• Traveling for reasons other than the event itself	• Divert non-attendee travelers around the impacted area. • Alter non-attendee time of travel to avoid conflict with event peak ingress and egress times.

Demand Management Strategies

Successful TDM strategies, developed to reduce the amount of event patron traffic, encourage the use of alternate travel modes. Essentially, a successful, integrated plan includes, for example, providing convenient alternates to driving an automobile to the event site and encouraging the use of these alternate travel modes. This includes increases in scheduled public transit service. In addition, express bus service can also be provided from park and ride lots to the event site as well as charter buses traveling to the event site from outlying areas. TDM strategies are also used to influence the travel patterns of non-attendee road users by encouraging a trip time shift or a change in travel mode. The resulting reduction in traffic demand reduces travel times for both event patrons and non-attendee road users. TDM also reduces delay, increases levels of safety, decreases motorist stress levels, reduces fuel consumption, and decreases certain vehicle emissions.

Table 7-2 contains a summary of travel demand management strategies.

High Occupancy Vehicle Incentives

The ultimate goal of any high occupancy vehicle (HOV) strategy is to increase the number of persons traveling in each vehicle. One option to reduce the amount of vehicles on the roadway is to encourage HOV use. In some areas, limited-access highways include HOV lanes to increase the attractiveness and efficiency of carpooling and vanpooling. Many of these HOV lanes are intended to assist commuters on a daily basis and, as such, the hours of the HOV may be limited to weekday commuting hours. In the case of a major planned special event, consideration should be given to continuing the HOV restrictions on these lanes to later weekday hours, or even into weekend hours, in order to encourage event patrons to carpool.

Incentives can be provided to encourage two or more persons per vehicle. Figure 7-2 illustrates one such example. The Suffolk County Fair and a radio station (WALK) in New York offered a promotion of $40 per carload on certain days. This price included parking, fair admission, and unlimited rides for everyone in the vehicle. In this manner, it was not economically feasible to travel alone, but rather to travel with as many people as possible in one vehicle.

Another strategy to encourage HOV's involves offering special privileges at the event site. Special parking lots can be restricted to HOV only, and these lots may be located nearer to the venue in order to encourage carpools. Lower parking rates further increase the attractiveness of this initiative. Private parking lot operators can be persuaded to offer special HOV pricing in exchange for promotion in special event advertisements. As demonstrated by Figure 7-3, this information needs to be relayed to the public so that they know the advantages of carpooling to the event site.

One successful implementation of HOV incentives took place at Husky Stadium on the campus of the University of Washington in Seattle for football games.(1) The Transportation Management Plan (TMP) included a parking pricing system to provide financial incentives for carpooling. During the 2000 football season, parking on campus cost $7 for vehicles with three or more persons and $10 for vehicles with less than three persons. Operators charged $17 for parking a recreational vehicle and $20 for buses, regardless of the number of people in the vehicle. In addition to the cost incentives, a marketing plan was also developed to encourage carpooling. Messages such as "carpools save

Table 7-2
Travel Demand Management Strategies

STRATEGY	DESCRIPTION	TECHNIQUES	USER GROUP
High occupancy vehicle (HOV) incentives	• Increase the number of persons traveling in each vehicle.	• Consider continuing HOV restrictions on HOV lanes to later weekday hours, or even into weekend hours, in order to encourage event patrons to carpool. • Reduce parking fees for vehicles with more than two people. • Provide free advertising for private lots to balance discounts given for HOV parking.	• Event patrons • Non-attendee road users
Event patron incentives	• Encourage event patrons to arrive early or leave late in order to reduce peak traffic demand.	• Consider departure strategies that encourage spectators to stay late after an event: ○ Post-event fireworks or concert ○ Special programming on stadium video screens ○ "Meet the mascot" promotion for children ○ Special discount with a ticket stub at nearby restaurants and pubs ○ Extended parking, at no additional cost, for event goers to encourage their patronage of downtown restaurants and shops after an event. • Consider arrival strategies that encourage spectators to arrive early before an event: ○ Registration in free drawings and contests that occur before the event ○ Early opening of venue restaurants and/or offering of special discounts ○ Tailgating encouraged in venue parking areas ○ Encouraging spectators to watch teams warm-up before the game	• Event patrons
Bicyclist accommodation	• Encourage the use of bicycles in traveling to/from the event.	• Provide proper bicycle paths (existing and temporary). ○ Maximization of safety for bicyclists ○ Avoidance of roadways with higher traffic volumes due to the event • Provide security in bicycle parking areas. ○ Staffing to prevent bicycle theft • Locate bicycle parking close to venue entrance. • Provide bicycle racks on transit buses to allow spectators to access mass transit while carrying a bicycle.	• Event patrons
Local travel demand management	• Increase the use of public transit. • Encourage car pools. • Shift work hours. • Shift commercial truck travel routes and delivery schedules.	• Encourage alternate travel choices. ○ Avoidance of travel during times of event ingress and egress ○ Avoidance of travel near event venue • Encourage businesses to implement TDM strategies. ○ Telecommuting ○ Carpooling ○ Flexible hours ○ Modified delivery schedules ○ Early release from work on event dates for infrequent night events • Use media to announce alternate routes to and around the event. • Contact commercial trucking companies. ○ Times to avoid routes serving the event venue ○ Reduction of number of truck trips ○ Shifting of some truck trips to nighttime (non-event) hours.	• Non-attendee road users

Figure 7-2
High Occupancy Vehicle Incentive

time and money and are a lot more fun than going alone" were incorporated into the Husky football transportation guide.

In addition to the plan implemented for University of Washington football games, a similar plan was implemented for Seattle Seahawks football games during the 2000-2001 season when stadium construction forced the Seahawks to use Husky Stadium for home games. The public information campaign for Seahawks football included a summary of available parking in the vicinity of the stadium. Since the Seahawks were playing in a temporary stadium, fans had to be oriented to: (1) new traffic flow routes to access the stadium and (2) new event parking locations and costs. A public information campaign outlined Husky Stadium parking limitations, including only 9,000 on-campus spaces being provided as compared to the 11,000 free on-street parking spaces and 35,000 off-street parking spaces around the Seahawks original stadium. Carpool parking pricing incentives were established similar to those used for University of Washington football games. At the beginning of the season, game day parking was $15 for carpools with three or more persons per vehicle and $20 for vehicles with less than three persons. Stakeholders reduced the carpool parking fee in mid-season to $10 in an effort to increase higher vehicle occupancy.

In addition to venue operators offering HOV privileges at venue parking areas, private parking operators in the site area can also be encouraged to offer special incentives to event patrons. For example, if private lot operators offer a special HOV discount, then the event advertisements can mention that particular private lot by name and location. The "free advertising" may help private operators balance discounts given for HOV parking.

Thus, three high occupancy vehicle incentive techniques include:

- Consider continuing HOV restrictions on HOV lanes to later weekday hours, or even into weekend hours, in order to encourage event patrons to carpool.
- Reduce parking fees for vehicles with more than two people.
- Provide free advertising for private lots to balance discounts given for HOV parking.

Carpool and save even more! Each time you arrive with two or more other passengers you'll receive a coupon for $3 off next year's Guaranteed Sonics Parking pass. A potential **savings** of almost **$130**!

Figure 7-3
High Occupancy Vehicle Parking Incentive *(Graphic courtesy of the Seattle Center.)*

Event Patron Incentives

Stakeholders managing discrete/recurring events at a permanent venue that generate high peak arrival and departure rates can encourage event patrons to *arrive early or leave late* in order to reduce the peak traffic demand.

Sporting events and concerts fall into this category given that, when the game or show ends, the majority of event patrons leave the venue at one time. This departure pattern scenario can be offset using several strategies:

- For instance, event organizers or venue operators can offer special incentives for spectators to stay after the event, such as special programming on the stadium video screens or post-event fireworks.
- Restaurants and pubs located in or near the event venue can remain open and may even offer special price savings with a ticket stub.
- Some sporting events and other types of events may feature live music after games in order to encourage spectators to remain at the venue.
- One incentive for parents to remain longer at sporting events with their children is a "meet the mascot" type of promotion.
- Venues in downtown areas can also provide extended parking, at no additional cost, for event patrons who wish to remain in the area and go to downtown restaurants or shops. Instead of parking lots having to be vacated a certain time after the event, extended parking hours allow event patrons to linger in the surrounding downtown area. These incentives help to spread out the flow of departing traffic and lessen the peak traffic demand on the roadway network. This concept also benefits businesses in the vicinity of the event venue.

Incentives that can be used to attract patrons to events earlier than usual include:

- Registration in free drawings and contests that occur before the event to attract spectators to the event site.
- Venue restaurants can open early and offer special incentives to attract spectators before the event.
- Tailgating may also be encouraged to attract event patrons to venue parking areas hours before the actual start of the event.
- Organizers of sporting events can encourage spectators to arrive early and watch teams warm-up before the game.

Venues that do not have pre- or post-event activities can solicit suggestions from the public through mailings or via the venue website. For example, when season ticket applications or tickets to the event are mailed, an accompanying survey can ask event patrons which type of pre- or post-game activities they would be more likely to take advantage of. Similar types of questions can also be presented on an event or venue website, as illustrated in Figure 7-4. As a result, the pre- or post-game events will cater to the persons who actually attend the event, thus increasing the number of spectators attending staged activities. For recurring events, stakeholders can survey the patrons in the venue or distribute suggestion cards when patrons enter or exit the venue.

One example of implementing successful event patron incentives involves the San Jose, CA "America Festival". The website for this event alerted spectators that they need to plan ahead for the event's hallmark 4th of July fireworks display since the park venue reached capacity early the year be-

fore. The website suggested that event patrons arrive early and see one of the many bands that performed at the festival in addition to sampling the food and drinks available. In this manner, the arrival patterns to the event become spread out over a longer time period. Instead of all spectators showing up at one time, the arrival patterns are influenced by the music that the event patron would like to listen to. In addition, the availability of food and drinks at the festival also helps to spread out the arrival patterns. These incentives reduce congestion by reducing the peak arrival rate of event patrons. Collectively, the incentives convert a discrete event (fireworks display) into a continuous event (festival).

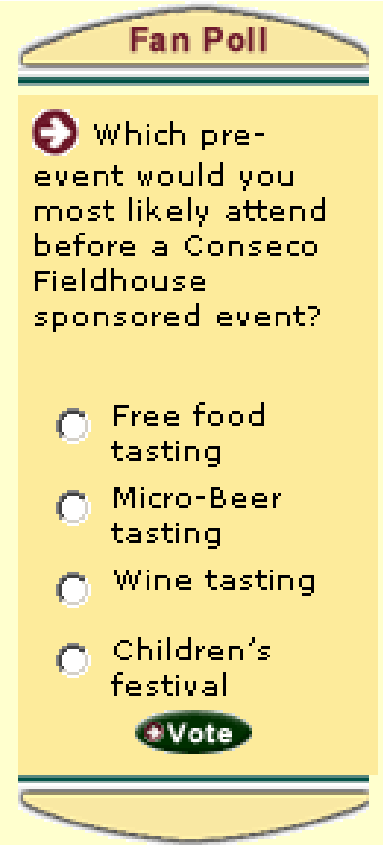

Figure 7-4
Venue Website Survey on Event Patron Incentives *(Graphic Courtesy of Conseco Fieldhouse.)*

In addition to the recommendations for arriving event patrons, the website also suggested that spectators remain after the fireworks for another concert. Figure 7-5 displays the slogan posted on the event website. In this manner, stakeholders assumed that some event patrons would leave immediately after the fireworks display and some would stay to listen to the music. This reduces the peak departure demand on the transportation system. The post-fireworks concert entertained spectators as they waited for traffic congestion to dissipate. In turn, event patrons did not feel that they were just "sitting around and waiting" for congestion to dissipate.

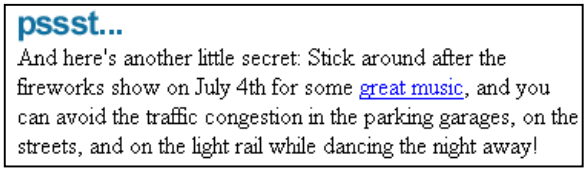

Figure 7-5
Event Patron Incentive *(Graphic courtesy of EHC & FILCO.)*

Bicyclist Accommodation

Another alternate form of transportation that can be used to access the event is a bicycle, especially in downtown areas. Special accommodations need to be provided for event patrons that wish to arrive by bicycle. Safety is a concern for all bicyclists, and proper bicycle paths need to be provided. These paths can consist of existing bike lanes and trails that are augmented with temporary paths leading to the event site. The provision of bicycle paths maximizes safety for the bicyclists and keeps them off roadways that experience higher traffic volumes due to the event.

Security represents a major concern of bicyclists. Figure 7-6 shows a bicycle parking area for a planned special event. In order to encourage bicycle travel, bicycle parking areas may be staffed (e.g., valet service) to

prevent bicycle theft. In addition, if the bicycle parking area is located close to the entrance of the venue, it may encourage event patrons to use their bicycles in order to access the event easier. Public transit operators may also provide accommodations for bicycles during events, such as bicycle racks on the front of transit buses that allow spectators to access mass transit while carrying a bicycle.

Figure 7-6
Bicycle Parking Area

Local Travel Demand Management

TDM strategies that reduce the amount of background, non-attendee traffic consist of:

- Increasing the use of transit (e.g. transit promotion).
- Encouraging use of carpools.
- Shifting of work hours.
- Shifting of commercial truck travel routes and delivery/travel times.

For non-attendee road users, a successful TDM plan encourages alternate travel choices, such as avoiding travel during times of event ingress/egress or travel near the event venue, that ultimately increase mobility and travel time reliability for these users compared to their default travel choice. This includes personal and business travel in addition to commercial truck travel.

Businesses can help minimize traffic demand during peak commuting hours through implementing TDM strategies such as:

- Telecommuting
- Flexible hours
- Modified delivery schedules

Carpooling should also be encouraged by major employers and through public information campaigns. In order to assist the business community in the implementation of TDM, information detailing recommended strategies and how to implement them should be distributed.

The event planning team should inform the local community as to the magnitude of the planned special event through a series of press releases and public service announcements. Alternate routes to and around the event can also be published in daily newspapers, discussed on local television or radio news, and communicated by public and private traveler information services.

In the special case of events that occur infrequently, businesses located in the immediate vicinity of a venue (e.g., hosting a Monday Night Football game) may allow employees to leave early on event dates. This initiative causes an increase in parking supply for event patrons. A public information campaign can be used to notify businesses of the possible problems that could occur and how these problems can be alleviated by clearing, for example, a downtown area prior to a certain time.

Successful local travel demand management techniques, instituted by local businesses, were utilized during the 2002 Winter Olympics in Salt Lake City, Utah.[2] These strategies effected a change in residents' travel patterns during the event. A post-event telephone survey indicated that about one-fifth of residents changed their travel patterns

during the games. The predominant change involved employers revising normal work schedules during the event and allowing earlier work hours or flexible schedules.

In order to reduce commercial truck traffic, stakeholders should contact pertinent trucking companies and advise them of times that truckers should avoid traversing freeway and arterial corridors serving the event venue. Trucking companies should attempt to reduce the number of truck trips made and shift some of their remaining truck trips to nighttime hours. Special mailings can be sent to long haul trucking companies in order to inform them of an upcoming planned special event and affected road corridors. In addition, fliers can be distributed to truck drivers at major points of entry to the region, disseminating information on the days and times of the event, high impact locations, and special traffic patterns. During the event, e-mails containing traffic advisories can be sent to trucking companies so that they can, in turn, get the word out to truckers via citizens-band radio and through their electronic distribution lists. Portable changeable message signs (CMS) and highway advisory radio (HAR) can also be placed at major ports of entry to alert truck drivers.[2]

Some components of a successful freight management plan include requiring trucks to have permits to enter certain areas between a set time frame. In this way only trucks that need to be in the area will be present during peak traffic times. In addition, delivery hours can be restricted to overnight to completely avoid conflict with event traffic. Long-haul trucking can be discouraged from certain roadways in the event area by providing directions on the roadway that divert trucks around the area surrounding an event venue.

TRANSIT SERVICE 

Overview

Modifications to existing transit service for a special event represent TDM strategies. The focus of the public transit agency is to increase ridership during the event by increasing the attractiveness of the service that it provides. In many locations and for many types of special events, additional ridership to and from special event sites can provide substantial additional revenue for the transit system at little additional cost. Also, transit system use may relieve traffic congestion around the venue.

Table 7-3 contains a summary of transit service strategies.

Public Transit Service Expansion

In order to maximize the use of public transit, options need to be convenient (e.g., faster travel time and satisfactory comfort level) for event patrons without impacting non-attendee transit users.

Three possible approaches to using public transit during special events includes:

- Existing service with additional vehicle hours. In general, this represents an extension of the existing service and is in addition to the regularly scheduled transit service. The extension of existing service may include: (1) expanded hours of operation or (2) increased frequency of system service on a particular route in order to serve a planned special event.
- Modifying existing service by creating a route deviation. A deviation involves adding a new transit stop near the event venue to the existing route. In addition, a deviation of the regular route may be required due to road or travel lane closures needed to stage the planned special

event. Because of these deviations, station-to-station travel times may change.

- Implementation of an express service to establish a special purpose route to and from the event. This service, including bus and commuter rail, usually requires riders to pay a fare, although event sponsors may reimburse the service cost or include the cost in the ticket price. The express service will involve an entirely new route and new schedule of service that accommodates the operational characteristics of the event served. Express bus routes may originate, for example, from regional park and ride lots or regional commercial centers with available parking. Express bus operations are discussed in more depth in the "Express Bus Service" section.

The Portland, Oregon area has a special Tri-Met SETS (Special Events Transit Service) Program that handles all requests for modifications to existing transit service due to a planned special event.[3] Requests for all special services are evaluated based on the following criteria as outlined in Tri-Met's Service Standards:

- *Serving the Public Interest* - Certain community events require the movement of large groups of people during certain hours of the day. These are events that would otherwise seriously restrict traffic movements unless public transit took an expanded role. Historically, these events are annual events, although some one-time events may also be considered. The decision to provide the service is based on an evaluation of available resources and the need for the service.
- *Cost Effectiveness* - The special service requested must be evaluated based on both operations and system cost and on the availability of operators and equipment.

Table 7-3
Transit Service Strategies

STRATEGY	TECHNIQUES
Public transit service expansion	• Maximize use of public transit. o Existing service with additional vehicle hours o Modifying existing service by creating a route deviation with a stop near the event venue o Implementation of an express service to establish a special purpose route to and from the event site
Express bus service	• Discourage event patrons from driving their vehicles to the event site due to expected site parking deficiencies and anticipated roadway congestion. o Using express bus service between a park and ride facility or remote parking lot and event venue o Using park and ride lots that best intercept spectator traffic as it approaches the event site.
Charter service	• Use a contract service to provide transportation directly to the event site from outlying areas (e.g., other neighborhoods and cities). • Consider both charter bus operations as well as charter rail service.
Transit Service marketing	• Establish a comprehensive transit marketing program. o Informing the public of the availability of public transit service to/from the event venue o Convincing the public to use the service

- *Patronage Potential* - The special service must be evaluated on its potential ridership.
- *Service That Could Be Provided By Others* - Consideration is given as to whether or not the service can be provided by others, which includes charter bus operations, taxis, carpools, vanpools, and other dial-up services. Included in these considerations are the possibility that larger buses may be needed based on cost, geographic limitations, and potential market penetration.
- *Partnership Building* - Tri-Met's goals include partnership building in the community. This helps to enhance Tri-Met's role as a community partner and as a facilitator of mobility.

In areas where service overlaps involve two or more agencies, inter-agency coordination is very critical especially on issues of fares, transfers, and scheduled service hours. One pitfall to avoid, especially for non-regular riders, is forcing riders to use several different fare instruments. In other words, transfers may not be allowed unless the rider pays a new fare. This obstacle should be eliminated through inter-agency coordination.

Express Bus Service

Stakeholders managing travel for a particular event may discourage event patrons from driving their private vehicles to the event site due to expected site parking deficiencies and anticipated roadway congestion. These spectators would likely utilize an express bus service, originating from a permanent park and ride facility or other vacant parking area (e.g., regional mall overflow parking area), if the service provides a higher level of service to event patrons compared to the drive-alone option. An express bus would furnish direct service to the event venue. In order for an express bus service to operate successfully, the express bus stations (e.g., park and ride areas) must be strategically located to intercept spectator traffic as it approaches the event. In determining appropriate express bus station locations, the event planning team should review the results of a feasibility study market area analysis.

Six successful examples of express bus service include:

- A successful public transit and express bus campaign was utilized during the 2002 Winter Olympics in Salt Lake City, Utah.[2] During the event, over 2.5 million passenger trips were recorded on the Salt Lake City public transit system for an average of about 150,000 per day. TRAX (Salt Lake City's light rail system) carried two-thirds of the passengers and park and ride express buses carried the remaining third.

- Another successful implementation of express bus service involves football games at Husky Stadium on the campus of the University of Washington in Seattle.[1] Football game attendees were encouraged to take public transportation to the stadium. All football ticket holders were able to ride King County Metro buses for free to the stadium via special service routes from park and ride lots in the region. Event parking revenues subsidized the cost of the express bus service.

- In addition to the plan implemented for University of Washington football games, a similar plan was implemented for Seattle Seahawks football games during the 2000-2001 season, when the Seahawks were forced to use Husky Stadium for home games. The Seahawks

developed a comprehensive public information and promotion campaign. The campaign, entitled "Tackle Traffic," included a full range of television, radio, and print media promotions. Fans were advised of the free fare transit service through the campaign. The campaign also informed event patrons that the transit service provided faster travel times than driving to the game due to the priority routes and loading locations assigned to buses before and after the game.

- The Regional Transportation District of Denver, Colorado provides an express bus service for Denver Broncos football games known as BroncosRide. This service provides transportation from 30 free park and ride lots in the surrounding area. A fee of $6 roundtrip is charged to each event patron for the bus service or spectators can also purchase a season pass. In addition, after the game, the express bus stations exist directly outside of the stadium.

- Milwaukee, Wisconsin hosts the annual, multi-day Summerfest music festival where special express bus service, provided by the Milwaukee County Transit System and other private companies, operates throughout the event. The express service utilizes existing park and ride facilities in the area. Certain buses are provided free of charge, while service on other express routes cost $5 for a roundtrip ticket with tickets available only at the point of origin.

- The Downtown Shuttle Service also operates in the Milwaukee downtown area. A list of parking lots and structures located near the shuttle route is disseminated on the event website. These parking facilities offer a special parking rate of $5 or less when event patrons enter after 5 P.M. on weekdays and all weekend. The Downtown Shuttle Service provides 5 to 10 minute headways during the event and stops at designated stations along the route serving the event. The cost of this service is $2 roundtrip.

Charter Service

Charter service represents a contract service that provides transportation directly to the event venue from outlying areas (e.g., other neighborhoods and cities). Users often can purchase tickets in advance and generally in conjunction with the event ticket. This service can include both charter bus operations as well as charter rail operations. The charter service configuration usually involves providing direct service to the event venue. However, service may also connect to an existing transit station or park and ride lot (e.g., express bus transfer).

Advantages of charter operations include:

- Provides the opportunity for residents of outlying areas to use mass transportation. This represents the main focus of charter service.
- Allows people who would not normally have access to public transportation for a particular event to use the service.
- Results in a reduction in traffic in the vicinity of an event site as well as on major corridor flow routes serving the site.
- May include free parking in the outlying area to help promote the service.
- Allows operators to offer special season passes at a discount rate to attract riders for recurring events (e.g., football games).

One key aspect of charter bus service concerns the need to provide emergency transportation for riders should the need arise. For example, charter service travel times

may exceed an hour. Patrons who use the charter service must remain in the area of the event until the completion since, typically, only one bus or train is utilized for the event. Therefore, if a patron needs to return home as a result of an emergency, a "guaranteed ride home" service needs to be provided as part of the charter service. This represents one of the factors against charter service and, therefore, the availability of an emergency ride home policy will likely attract more users.

One example of a successful charter service involves the Rochester-Genessee (NY) Regional Transportation Authority (RTS). The RTS runs a charter bus operation from the Rochester area to Buffalo Bills' games. The first pick-up is at the RTS headquarters and occurs 4 ½ hours before the kick off. Three more stops exist, 4 hours, 3 ½ hours, and 2 hours and 45 minutes before the game. After the last stop, a direct trip is taken to the stadium facility with the bus arriving one hour before kickoff. The charter bus departs for the Rochester area 45 minutes after the completion of the game. RTS operates a similar charter bus operation for Syracuse Orangemen football and basketball games, including the first stop a full 4 hours before the event start.

Public transit agencies may provide charter service, but only under special circumstances. In cases where the Federal Transit Administration (FTA) subsidizes a particular transit agency and that agency wants to provide any charter service using FTA funded equipment or facilities, then the transit agency must first determine if any local private bus companies can and will elect to provide the desired charter service. If a private operator exists, FTA regulations prohibit transit agencies from establishing a charter service with FTA funded equipment or facilities. Public transit agencies must submit a charter service request to the FTA at least 90 days prior to the first day on which the transit agency wants to provide charter service. Specifics of this FTA regulation are contained in 49 CFR Part 604, "Charter Service" which went in effect on May 13, 1987.

Transit Service Marketing

In order for public transit to be effective, the general public must be made aware of the benefits of using the transit system. This can be accomplished through a comprehensive transit marketing program. This program serves to: (1) inform the public of the availability of public transit service to/from a special event venue (2) convince the public to use the service. Stakeholders can develop various marketing techniques to accomplish one or both of these tasks.

San Francisco Giants Program

One successful implementation of a transit marketing program involved the San Francisco Giants baseball team in coordination with the regional Metropolitan Transportation Commission (MTC), Bay Area transit operators, and the San Francisco Department of Parking and Traffic. These stakeholders collectively developed and implemented a comprehensive transit marketing campaign prior to the opening of the new Pac Bell Park in San Francisco.

The goal of the program involved attracting patrons to transit in large numbers. The name of the campaign was "Your Ticket Home," and it was funded by the Giants, the MTC, and a number of corporate sponsors. Each corporate sponsor's logo was printed on materials associated with the campaign. The transit marketing program targeted first-time transit riders. Since the Bay Area has an extensive public transportation system, the main focus of the campaign was to educate the traveling public. Key elements of the transit marketing campaign included:

- *Transit Information Guide* – A pocket-sized foldout information guide was developed and widely distributed to Giants fans, including all season ticket holders.
- *Transit Information Hotline* – A toll-free number was developed to provide live transit planning assistance for patrons.
- *Transit Tickets by Mail* – Giants season ticket holders were provided the opportunity to purchase transit tickets in advance through the mail.
- *Transit Incentive Program* – Giants fans that purchased transit tickets in advance were rewarded with points toward the Giant's fan appreciation program.
- *Transit Advertising* – An advertising campaign was developed using the "Your Ticket Home" logo and was featured on Bay Area trains and buses and in the ballpark. The use of public transportation was also heavily promoted on Giant's radio and television broadcasts as well as on the scoreboard inside the park.
- *Transit Ambassador Program* – The Giants and the various transit agencies worked together to provide "transit ambassadors." These ambassadors helped to answer questions and guide new riders through transfers and fare collection procedures at various stations. These ambassadors wore brightly colored uniforms that were easy to recognize.

The Giants, the MTC and the San Francisco Department of Parking and Traffic also worked together to effectively publicize available transit services through local media including newspapers, television, and radio. In addition, press releases were issued and interviews were scheduled on television and radio to further promote the transit program.

PRE-TRIP TRAVELER INFORMATION

Information Needs

Various traveler information techniques are used to disseminate information to the public, including both event patrons and non-attendee road users, so they can be better informed when planning their trip to a planned special event, or around an event. Table 7-4 lists techniques used to provide pre-trip information to the traveling public.

Table 7-4
Pre-Trip Traveler Information Dissemination Techniques

TECHNIQUE
• Internet
• Telephone information systems
• Public information campaign
• Event and venue transportation guide
• Kiosks
• Television
• Newspapers
• Changeable message signs
• Highway advisory radio

The primary function of pre-trip information involves assisting drivers with decisions regarding route planning, travel mode, and the time of day to travel. Accurate pre-trip travel information will provide benefits to all transportation system users in the form of time and cost savings.

Pertinent information that event patrons may want before beginning their trip include:

- Best driving route to the venue from specific origins (e.g., cities or freeways)
- Best public transit route
- Parking area locations and parking fees, access to disabled parking spaces, and times that the parking areas open before the event

- Recommended event ingress and egress routes, particularly if different for arrivals and departures
- Up-to-the-minute roadway information (e.g., current traffic conditions and weather conditions)
- Estimated travel time by different travel modes
- Event information such as times and schedules
- Recommended speed/safety advisories
- Scheduled roadway construction and maintenance lane closures
- On-street parking restrictions during the event
- Heavy vehicle restrictions
- Expected delays leaving the event

This information may help event patrons better gauge the utility associated with available travel choices and, in turn, assess what transportation mode and route they will be taking to the event. Pre-trip traveler information also helps event patrons budget sufficient time in accessing the event venue.

Non-transportation information that may be pertinent to an event patron's travel plan includes security procedures. This encompasses items allowed to be brought into the parking area or the venue itself, including pets. This information is important since it may impact the amount of time it takes spectators to get into a parking area or venue. Other information includes what vendors are available on-site, since event patrons may have the option of eating before or after the special event. This will impact the time the event patron designates for venue arrival. In addition, a seating chart and gate locations may assist the spectator in selecting which parking area to use.

Non-attendee road users also desire information on event specifics, but this information is directed more to possible road/lane closures or changes in normal traffic patterns. The main issues for the non-attendee road user becomes, "How will the event generated traffic impact my daily driving routine?" The most relevant information is up-to-the-minute traffic reports in the area of the venue, used by non-attendee road users to determine if their travel route needs adjusting. Information on travel lane closures is also important to determine if extra time needs to be budgeted or an alternate route taken.

All of this pre-trip information helps transportation system users plan their best route to and from the event or around the event. The event patrons will have the information they need to arrive on time for the event; moreover, the information will prepare them for what may lie ahead in their trip. The non-attendee road users are also made aware of what to expect as a result of a planned special event. If residents and businesses in the area surrounding a venue incur significant impacts, then it may be more difficult, in the future, to obtain special event permits in the area.

In order to improve public understanding, cooperation, and acceptance of the planned special event, stakeholders should consider the following actions:

- Develop public information programs to encourage early travel to the event and/or spectator use of alternative routes or transit.
- Develop public information programs to encourage non-attendee road users to consider transit, ridesharing, and alternative work hours.
- Develop agreements with trucking agencies to avoid peak period travel and deliveries.

Internet

Internet websites have several key points of interest when they are used to disseminate traveler information:

- Provide global information distribution since geography is not a limiting factor.
- Facilitate interactivity by allowing users to control information display. Users can find information about what they are interested in and may also find information they did not know was available.
- Can target a specific subject area and concentrate on this area with links to other related sites.
- Provide detailed information that is not easily conveyed by telephone.
- Provide flexibility since revisions and updates can be made in a fraction of the time and cost of re-printing material (e.g., brochures).
- Identify conditions affecting service, thus answering the question: "Why are there delays on this section of roadway at this time?"
- Use graphics capabilities. Users understand complicated subject matter better when presented with graphics. This concept holds true with driving directions and transit maps, for example. It is easier to digest the information via a map rather than read a table of times and destinations. In addition, the graphics can be printed and used at a later date if needed.
- Promote existence and use of telephone information systems (e.g., 511 service).

Public Agency Websites

As illustrated in Figure 7-7, a typical public agency website includes up-to-the-minute information for the traveling public both before the event and on the day-of-event. Information provided on these websites includes traffic conditions, such as road segment speeds or traffic incident locations. In addition, websites can include in-depth details regarding traffic incident characteristics by allowing the user to click on icons for a more detailed explanation. As an example, if a certain icon shows a traffic incident, the user can click on that icon and see a more detailed explanation of the traffic incident itself.

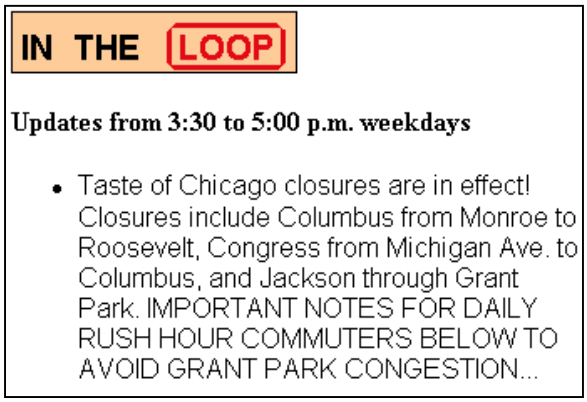

Figure 7-7
Traffic Information Dissemination Via a Public Agency Website *(Graphic courtesy of the Chicago DOT.)*

Public agency websites also provide information on roadway closures, locations of roadway construction sites, and details of planned special events impacting transportation system operations. Again, the user can obtain more detailed information for each location by clicking on a certain area within the website. A typical public agency website may provide weather information along with information on pavement conditions.

Public agency websites may disseminate closed-circuit television (CCTV) camera images. By clicking on CCTV location icons, a snapshot picture of the latest CCTV image is shown on the website. In addition, locations of CMS and their current message can also be shown. Public agency websites, or private traffic advisory services, may also allow users to subscribe to an alert system that allows them to receive e-mails if a traffic incident, roadway construction, or

planned special event impacts operations on a user-defined route.

One successful implementation of a website for disseminating pre-trip traveler information was the Utah DOT's CommuterLink Website (CLW) used during the 2002 Winter Olympics in Salt Lake City, Utah.[2] The CLW represented the most highly accessed traveler information element during the Olympics. It included typical public agency information on traffic conditions including speeds and incidents. It also disseminated information on roadway closures, current roadway construction, weather conditions, and pavement conditions. In addition to the typical public agency information, the CLW provided Olympics travel information.

In order to assess the usefulness of the CLW during the Olympics, a survey was conducted of both residents and visitors to the Salt Lake City area. The results of the visitor survey showed that 41 percent of visitors heard of the CLW and 34 percent of visitors stated they used the CLW. The results of the resident survey indicated that 70 percent of residents heard of the CLW while 21 percent used it. Both visitors and residents indicated that they used the CLW to obtain:

- Traffic information
- Road conditions
- Olympics information (e.g., travel options and event operations information)
- Weather information

Event or Venue Website

A typical planned special event or venue website includes event start times and directions to the event. The website can also provide information on parking area locations, fees, alternate routes, or incentives to use different modes of transportation. A venue website represents one of the best techniques to reach the people attending the event. Successful websites also provide information on the availability of public transportation and route maps for all public transportation alternatives. Venue ingress and egress routes can be specified on a website to provide valuable advance information to the traveling public. Appendix L contains examples of public agency and event-specific websites.

Telephone Information Systems

Another method to disseminate pre-trip traveler information to the public is by the use of telephone information systems (e.g., 511 service). This system consists of an automated voice recognition system and/or a menu that can be accessed by using a touch-tone phone, and the system provides up-to-the-minute traveler information. The system includes information on traffic conditions, public transit information, and road conditions. The system can also provide event-related information such as times, location, and event descriptions. Parking information can also be provided, such as parking locations and parking lot status information. The system can furnish updated information on event travel alternatives throughout the event. Stakeholders should coordinate with telephone information system operators (e.g., state DOT) to ensure that information pertaining to a specific planned event is included in the system and updated regularly.

Marketing a 511 service for a planned special event includes the following considerations:

- Deployment of roadside signs on travel routes to the event venue and placed in advance of the event dates.
- Promotion through the media.
- Establishment of partnerships between 511 service operators and all venue operators in a region.

- Use of television commercials and radio advertisements.
- Use of an event transportation guide for information on the service.

In addition to disseminating information via the Internet during the 2002 Winter Olympics, the Utah DOT also operated a 511 telephone information system. Figure 7-8 shows the 511 service structure established by the Utah DOT. On a typical day during the Olympics, the 511 service received 1,923 calls.[2] Callers to the 511 service accessed the following main menus within the system:

- Traffic menu
- Transit menu
- Olympics menu
- Road conditions menu

Both residents and visitors were surveyed in regard to an evaluation of the telephone information system. The results of the survey showed that 25 percent of visitors heard of the 511 service and 17 percent used it. The survey results reported 44 percent of residents heard of the 511 service; however, only 4 percent of residents used it.

The 511 service is normally run by a regional or statewide public agency, and the service is not intended solely for planned special events. A telephone information system is also used on a daily basis by commuters and other travelers in the area to obtain information on daily traffic conditions. However, one way that planned special event stakeholders can promote use of the existing service is to advertise it on the event website. This was done on the Bristol (TN) Motor Speedway's website. On the first page of directions to the venue, an advertisement, shown in Figure 7-9, was placed for the area's 511 service. As a result, the event website alerted event patrons of a means to obtain accurate, up-to-date traveler information before commencing their trip to the event venue or while enroute.

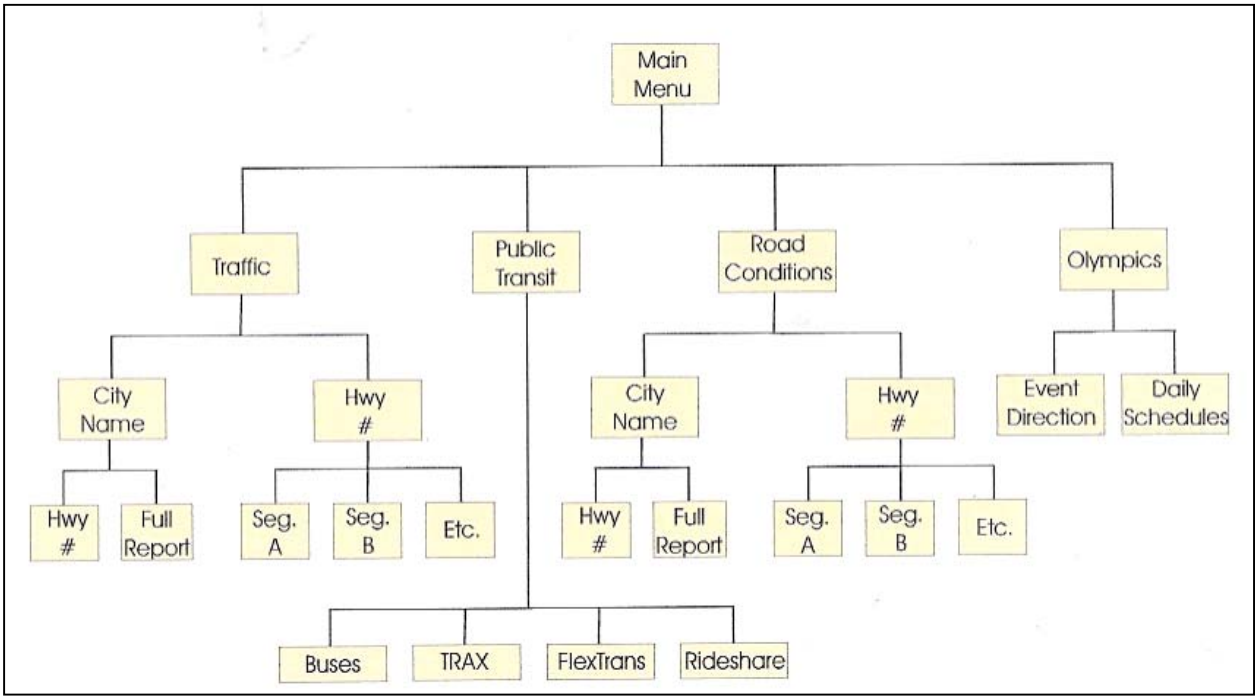

Figure 7-8
Telephone Information System Menu Structure[2]

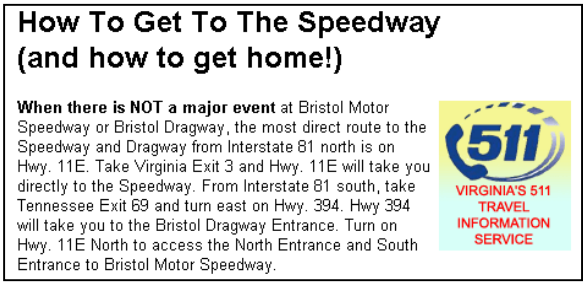

Figure 7-9
Promotion of 511 Service on Event Website
(Graphic courtesy of Bristol Motor Speedway.)

Public Information Campaign

A public information campaign is simply an outreach initiative designed to disseminate a message(s) to a general audience and to garner public response to the message subject.

Key considerations include:

- In order for a public information campaign to be successful, stakeholders must initiate the campaign well in advance of a special event.
- Information disseminated through the campaign needs to reach both event patrons and non-attendee road users.
- Maps showing event site and location of parking areas, as well as any associated roadway closures and/or special traffic patterns, can be placed in local newspapers. In addition, this information can be broadcast on local radio and television newscasts throughout the day.
- Special media briefings can be held in advance of the event so that the media has ample time to inform the public of the upcoming activities. Stakeholders can provide the media with maps and written information.

As shown in Figure 7-10, television advertisements can broadcast telephone numbers to call for additional information about a planned special event and related travel options.

Figure 7-10
Public Information Campaign Promotion

The Wisconsin DOT and its stakeholder partners provide several information packages for events held throughout the state. One such event was the 2002 Major League Baseball All-Star game held at Miller Park in Milwaukee. The DOT provided a detailed brochure for event patrons going to the baseball game, informing them of road construction and potential difficulties (e.g., delays) in accessing the ballpark. The brochure then specified, in detail, alternate routes that motorists could take to avoid the most congested areas. The brochure also directed event patrons to the DOT website for further information concerning any topic covered.

The Wisconsin DOT also produced a brochure entitled "Get Down Downtown" for the Milwaukee area. This brochure included maps of the area that specified all on-going roadway construction projects. It also provided information on available public transit system service and parking area locations. Suggestions, such as "carpool with friends and coworkers," were made to reduce traffic demand in the downtown area, particularly when planned special events occur. The

brochure listed summer travel tips in addition to guidance (e.g., websites) on where to get more information about any particular topic. In this manner, the brochure provided an abundance of information while not overburdening the reader. Instead of the reader having to look through an entire guide, subject areas were listed coupled with statements on how to obtain additional information. Figure 7-11 presents the summer travel tips communicated by the brochure.

Event and Venue Transportation Guide

Another strategy that can be used to distribute pre-trip traveler information is through an event-specific or venue transportation guide. These guides are normally distributed to event patrons when they receive their tickets for an event, or the guides can be downloaded from an event or venue website. Local hotels can also maintain copies of the transportation guide.

Typical items that may be included in a transportation guide that comprise useful pre-trip traveler information include:

- Schedule of events
- Driving directions
- Area map
- Inbound and outbound traffic flow routes
- Parking areas
- Area transportation options

Transportation guides can illustrate the benefits of carpooling. Parking facilities within a downtown area can be shown, and the guide can emphasize those parking facilities that offer HOV pricing. Local access streets can be identified with a request not to use those streets while driving to and from the event unless the driver intends to patronize local businesses either before or after the event.

Figure 7-11
Public Information Campaign Brochure

Appendix M contains an example of a venue transportation guide prepared for Ford Field in Detroit, Michigan.

The Nazareth Speedway in Nazareth, Pennsylvania produces an informative venue guide each year that provides in-depth information about the raceway itself as well as travel options to the venue site. Appendix M contains the transportation section of the guide prepared for this venue. This guide can be downloaded from the venue's website. The opening sections of the guide provide a venue overview and list important travel tips, including the use of recommended routes and the possibility of incurring delay due to both traffic congestion and security issues. Since ingress and egress traffic patterns differ, both sets of directions are communicated in the venue guide. A facility map shows available amenities as well as parking area locations (including disabled parking). In addition, the guide includes a grandstand map and states parking area opening times in addition to parking rules and regulations.

Other Technology Applications

Other technology applications include:

- Kiosks
- Television
- Roadside traveler information devices

Kiosks

Kiosks are used extensively to provide multi-modal transportation information to the traveling public, such as:

- Area maps
- Route guidance information
- Real-time travel condition information (e.g., speeds, traffic incidents, etc.)
- Planned special event information
- Road construction and road closure information
- Public transit information
- Weather information.

Successful kiosk implementations include information that can be displayed on a color-coded map and/or printed. This information can include such items as turn-by-turn route planning. The ideal location for a kiosk is in high pedestrian traffic areas, such as hotels, tourist attractions, businesses, schools and universities, military bases, shopping malls, rest areas, hospitals, and amusement parks.

The kiosk concept is used extensively in the San Antonio, Texas area which operates 4 outdoor and 36 indoor interactive traveler information kiosks.[4] Before deployment of the kiosks in San Antonio, a focus group was established that randomly selected people in the area to try the kiosk software. This allowed designers to evaluate different types of presentation layouts and information and to base designs on user feedback. The design process proved successful in creating demand for the kiosks in the San Antonio area.

Television

A successful pre-trip information strategy includes the use of local media outlets to disseminate information to the traveling public. During planned special events, television stations may show actual footage obtained from CCTV cameras along roadways in order to communicate real-time traffic information. These CCTV camera links originate from a transportation management center (TMC), and the TMC can prevent media access to certain cameras for security or privacy reasons. In addition, a successful information campaign includes the release of regular e-mail or voice recording updates to various media outlets by TMC operators. The local media outlets, especially radio and

television, use this information to alert motorists of traffic incidents, alternate routes, and general traffic information.

Television can be used to disseminate pre-trip traveler information by way of regular broadcast updates or a dedicated cable television channel. A dedicated channel allows travelers to turn on the television and view a traffic report with little delay. As shown in Figure 7-12, maps can be provided that show icons with traffic incident locations and color coded road segments that indicate current travel speeds. Television traffic reports can broadcast planned special event travel information as well as road closures, construction, detours, weather conditions, transit, and current traffic conditions.

Figure 7-12
Television Travel Report

Roadside Traveler Information Devices

Roadside traveler information devices, such as CMS and HAR, can be used in the days and weeks prior to an event to alert commuters and local residents of possible special traffic patterns and closures due to a future planned special event. Device messages can be specific in terms of the exact days and times of the anticipated travel impacts and roadway modifications. Message broadcast should commence at least one week prior to the planned special event.

HAR can disseminate more detailed information about transportation alternates and parking access for the event. The service can promote alternate modes of travel such as light rail, bus, or bicycle. In addition, information on shuttle buses for the event can be included in HAR message sets.

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CHAPTER EIGHT
IMPLEMENTATION ACTIVITIES

Figure 8-1
Personnel Monitoring of Arterial Ramp Closure

PURPOSE

This chapter describes the third phase of managing travel for planned special events. Implementation activities mark a transition phase between event operations planning and day-of-event activities. Therefore, the phase involves both the event planning team and traffic management team. This phase includes activities key to the success of any planned special event, including *implementation plan* development, stakeholder *review and testing*, and *personnel* resource management.

The underlying objectives of the chapter material are to: (1) improve the efficiency of traffic management plan deployment and (2) increase traffic management team preparedness. In turn, this creates a more responsive traffic management team and fluid team operation, thus translating to better transportation system performance on the day-of-event.

INTRODUCTION

The operational success of a planned special event traffic management plan rests on traffic management team members having first-hand knowledge of pertinent plan strategies and tactics. Although most stakeholder agencies comprising the traffic management team participated in developing the traffic management plan, the actual stakeholder representatives may be different. Middle and senior level personnel partaking in event operations planning initiatives may assume a

traffic management team supervisory position, while agency field-level personnel may implement traffic management plan specifications and details. An implementation plan instructs field-level personnel, some of whom have little or no direct experience in managing travel for planned special events, on the what, when, and where aspects of their assignment in relation to traffic management plan requirements. On a management-level, an implementation plan specifies an action plan for activating, changing, and deactivating various traffic management plan provisions.

Review and testing allows the traffic management team to identify potential limitations of the traffic management plan *prior to* the day-of-event. With stakeholder agencies representing various jurisdictions and disciplines, review and testing promotes traffic management team coordination and increases stakeholder familiarity of the duties, responsibilities, and capabilities of other stakeholders. Activities range from tabletop exercises that examine how different agencies react to various scenarios to "hands-on" applications that can involve a full simulation or deploying a traffic management plan for smaller planned special events as a test.

In developing the traffic management plan, stakeholders design transportation control and management strategies to satisfactorily mitigate the impacts of event-generated travel demand. The level of response required to implement planned mitigation measures may place significant strain on agency and contractor personnel available on the day-of-event. The recruitment of temporary staff and volunteers expands traffic management team capabilities and elevates its operations efficiency. Practitioners can capitalize on the benefits of having additional personnel resources by recognizing volunteer limitations and applying proven training methods.

IMPLEMENTATION PLAN

Overview

An implementation plan details the actions required to put a traffic management plan into effect on the day-of-event. Its purpose is to: (1) define personnel assignments that indicate the roles and responsibilities of individual traffic management team personnel on the day-of-event, (2) describe a scenario-based, operations *game plan* at the management-level, and (3) communicate instructions and organize personnel at the field-level. It is intended for use by individual traffic management team personnel at the command post and in the field. While the traffic management plan indicates *how* traffic, parking, and pedestrian operations will be managed, the implementation plan describes the *what, when,* and *where* in terms of personnel and equipment resource deployment needed to execute traffic management plan provisions. Traffic management plan revisions made on the day-of-event mandate corresponding implementation plan modifications. Field personnel may lack familiarity with a traffic management plan developed by mid-level and senior-level agency representatives, and an implementation plan ensures a coordinated and consistent traffic management team effort and prevents field personnel from having to make independent decisions. Table 8-1 lists general field-level operations guidelines.

Table 8-1
General Field-Level Operations Guidelines

ACTION
• Follow assignment detail, unless revised by a supervisor (via command post).
• Review traffic control at adjacent locations.
• Review event permits and passes to minimize confusion and traffic flow disruption.
• Maintain radio communication with pertinent supervisors and/or command post.
• Expect temporary changes in operations detail.

The implementation plan communicates traffic management plan specifics using a quick reference format. The plan ranges from a memorandum to a detailed manual depending on event size and scope of plan coverage. Figure 8-2 shows two examples of implementation plans prepared for a specific planned special event. Individual stakeholders may develop a plan for the freeway/arterial corridor(s) or street networks under their jurisdiction. A large-scale implementation plan, such as an event manual, is organized by: (1) traffic management plan component (e.g., signing plan, intersection control plan, etc.), (2) zones correlating to supervisor assignments, or (3) agency jurisdiction.

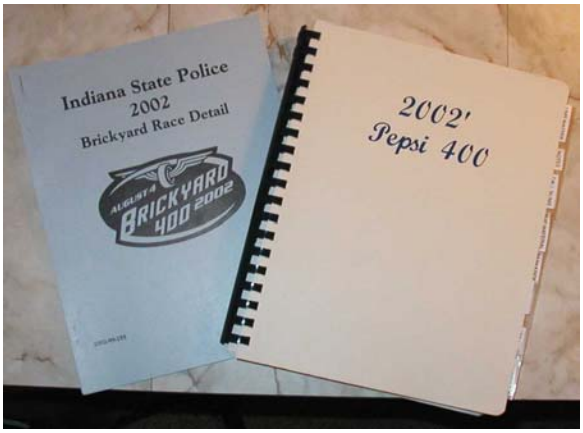

Figure 8-2
Planned Special Event Implementation Plans

Traffic management team supervisors should develop an implementation plan prior to any review and testing exercises to permit revisions and allow the participants an opportunity to become familiar with the details of their assigned job. The key to plan development, and day-of-event operations, involves assigning the right personnel, authority, and responsibility to effect optimal traffic management plan deployment. Complex tasks require skilled personnel with satisfactory experience. The implementation plan should empower traffic management team supervisors at every level: event command post, agency command post, and field locations. This allows lower-level staff to resolve certain problems without having to contact the command post, thus reducing the burden on command post personnel. While review and testing exercises may not involve all traffic management team personnel, supervisors should conduct an implementation plan review with field staff prior to the event or during day-of-event roll call.

Plan Specifications

An implementation plan describes functional activities, as specified in the traffic management plan, by location and/or resource/infrastructure type. Locations include freeway and street segments, freeway ramps, intersections, mid-block locations, and parking area access points. Specific resources and infrastructure include roadway traveler information devices, static signs, traffic control equipment, and traffic signals and associated timing plans.

The overall implementation plan organization creates numerous action plans for specific traffic management personnel or small personnel groups. Location-specific details typically specify traffic and/or pedestrian control duties and responsibilities. With regard to equipment deployment, the implementation plan contains protocol for delivery, installation, monitoring, and takedown. Stakeholders design the implementation plan to match specific personnel experienced in operating certain equipment and infrastructure.

Table 8-2 presents an implementation plan checklist. Appendix N contains example implementation plans prepared for specific planned special events. All planned actions, even if not explicitly noted in the table, must include what, when, and where instructions. For multi-day or multi-venue events, traffic control strategies and resource deployment can be organized through matrices for easy

Table 8-2
Implementation Plan Checklist

ELEMENT	ACTION
Command post operation	• Indicate agencies staffing the command post in addition to the name and schedule of agency representatives. • Specify equipment needs and times of delivery and set-up. o Computers, networking, temporary phone and modem lines, televisions and radios, dry erase board or flipchart(s), message board, office supplies, furniture. • Indicate procedures for accessing the command post (e.g., clearing security) • Specify vehicle parking area and helicopter landing area.
Operations timeline	• Indicate command post location and hours of operation. • State parking, traffic control, and service patrol shifts. • State when egress plan goes into effect. • Specify parking area and venue gate open/close times. • Summarize the location and time (close/reopen) of planned full/partial road closures. • Include event schedule, such as event start time, event end time, and significant activities during the event (e.g., parade detail and headline entertainment schedule). • State times of sunrise and sunset, if applicable to traffic control measures (e.g., use of portable lighting).
Operations management	• Indicate scenario-based criteria for implementing traffic management plan components (e.g., traveler information message sets, traffic flow routing, reversible lane operations, etc.) • Include a series of operations details for sequential time segments on the day-of-event. • Specify contingency plans – indicate available plans and associated equipment/personnel resource deployments and changes in traffic management team command. • Indicate procedure for revising the traffic management plan on the day-of-event. • State protocol for terminating traffic and parking management detail. • Summarize traffic management plan changes since previous event.
Contact information	• State contact information for individual traffic management team members. o Home phone, work phone, cell phone, pager number, fax number, e-mail address, unit/radio assignment, rank, detail assignment, vehicle assignment. • Include contact information for agencies involved in contingency plan deployment.
Communications	• List radio call-sign of traffic management team members. • Indicate guidelines and restrictions regarding use of various radio channels or talkgroups (e.g., field-to-field communications, field-to-command post communications, non-event communications).
Traffic management team organization	• State agency duties, responsibilities (e.g., traffic control, traffic signal operation, traveler information device operation, etc.), and jurisdiction. • Specify highest-ranking agency representative on the day-of-event in addition to mid-level (e.g., zone) managers. • Summarize chain of command.
Equipment and infrastructure management	• Mandate pre-event equipment check (e.g., CMS operation). • Specify locations and quantities of traffic control and other support (e.g., portable lighting) equipment. Indicate equipment owner and, if applicable, power source. • Indicate equipment delivery, installation, and removal schedule in addition to personnel assignments. • Indicate schedule and location (zone) assignment of available equipment maintenance crews on the day-of-event. • Include equipment operating instructions (e.g., remote HAR programming). • Indicate temporary static sign locations and descriptions. • Specify planned traveler information message sets (e.g., CMS and HAR). • Specify personnel responsible for monitoring and programming traveler information devices on the day-of-event. • Indicate protocol and personnel charged with implementing different traffic signal timing plans as-needed on the day-of-event.

ELEMENT	ACTION
	• Indicate protocol and personnel charged with monitoring traffic surveillance equipment (e.g., CCTV). • List available maintenance personnel and equipment resources.
Location-specific traffic and pedestrian control	• Indicate agency personnel (e.g., number of staff or individual name, rank, and unit/radio assignment), report date and time. • Specify schedule and route of roving service patrols. • State protocol and personnel assignments for maintaining unobstructed emergency access routes. • Specify task instructions, including traffic and pedestrian flow restrictions and permitted movements (e.g., special allowances for local traffic, buses, etc.). • Summarize the location and time (close/reopen) of planned full/partial road closures encompassing a particular location. • Provide step-by-step directions in order for substitute personnel to quickly learn protocol. • Include explanation, supplemented with graphics, of special event parking area permits and event passes.
Post-event evaluation	• Describe components of post-event field personnel debriefing. o Time of heavy traffic and pedestrian flow o Qualitative assessment of traffic and pedestrian operations at location. o Recommendations to improve traffic and/or pedestrian flow at location

reference. Traffic management team supervisors should maintain a full version of the event traffic management plan, including contingency response plans, at the command post.

In an effort to best prepare traffic management team personnel, particularly team supervisors, for day-of-event operations, the plan can include a qualitative evaluation summary of transportation system operations for a previous, similar planned special event. This allows team members to familiarize themselves with past operations and lessons learned. The plan may highlight new provisions and changes for the subject event aimed at mitigating past lessons learned.

REVIEW AND TESTING

Purpose

While all of the steps discussed up to this point are important, the best traffic management plans may fail if they are not reviewed and tested prior to their implementation. The event operations planning process, by its very nature, is based on assumptions and expectations. Those event planning team members who helped draw-up the plan may have a thorough knowledge of their agencies' experience and capabilities, but there are probably many traffic management team members and volunteer personnel who had little or no role in developing the plan, yet have the responsibility of implementing it and managing travel on the day-of-event.

While a traffic management plan can cover many contingencies, it cannot cover all possibilities. Review and testing can allow participants to see how they handle various scenarios and how varying elements can affect the plan. The testing of the plan should be considered part of the overall training that is needed for traffic management team personnel to become familiar with the plan and their role in it.

This section covers what should be done in the days leading up to plan deployment, including simulation exercises and equipment testing which will help assure that what is planned is what actually happens.

Stakeholder Simulation Exercises

A plan is just a plan until it is implemented. Simulation exercises allow that plan to be given life and allow stakeholders to see how it might work in the real world of the planned special event.

The simulation exercise can test important elements such as: (1) interagency communications, (2) deployment of personnel and equipment, and (3) information gathering and dissemination. While stakeholders may conduct the exercise at the venue where the planned special event will occur, much of the plan will involve permanent transportation management centers (TMC) or temporary command posts which are in operation before, during, and after the event. Therefore it is important that all of the responsible agencies and TMCs, which may have a role to play during the actual event, be involved with the simulation exercise.

Communications should be tested not just from a technical standpoint but also to make sure what is being communicated is understood. The simulation provides an opportunity to make certain this part of the plan works as expected.

Exercises can take on two different forms:

- A tabletop exercise
- A full-scale simulation

The purpose of both types of exercises is to: (1) test the written assumptions in the traffic management plan and (2) see what must be changed and how the plan can be improved. No matter how thorough a traffic management plan may be, it can not account for all contingencies. The plan assumes participants will follow the steps laid-out, but individuals make mistakes and equipment may fail. Both the tabletop and full-scale simulation allow the participants to see how they react to those unexpected events.

Without the benefit of testing the traffic management plan, discrepancies may not be realized until the actual implementation of the plan. During simulation exercises, mistakes can be discovered while there is still time to make modifications and before any negative consequences are realized.

In both a tabletop exercise and a full-scale simulation, participants receive and use the written traffic management plan and implementation plan as the basis for their actions. Table 8-3 lists elements of a typical exercise.

Table 8-3
Elements of a Stakeholder Simulation Exercise

ELEMENT
• Identify the stakeholders who will participate in the exercise. • Distribute copies of the traffic management plan and implementation plan to participants. • Develop a script for the exercise, including surprise elements that may not be addressed in the traffic management plan. • Provide a timeline for the exercise to play-out (the exercise will probably take place in an accelerated timeframe compared to a real-life event). • Identify reviewers who will watch the exercise and take notes. • Provide time to review the exercise. • Modify the plan based on what was learned during the exercise.

The goal of the testing is not to be mistake-free, but to identify potential problems. Therefore, when the actual event takes place errors, may be minimized and the event can run smoothly.

For both tabletop and full-scale simulations to be effective, they should test as many parts of the traffic management plan as possible using scenarios that are as realistic as possible. Since participants can not be expected to remember all that takes place during the exercise, it is critical that observ-

ers be used to: (1) watch what happens, (2) take notes on what is seen and heard, and (3) recount observations during the review process. Participant input is also crucial in the review process. They can note difficulties experienced during the exercise that might not be obvious to observers. Reviewers should debrief participants as soon as possible after the exercise so participants do not forget what they experienced. These participant observations should also be included in a more extensive review of the exercise.

Individuals who do not represent day-of-event traffic management team personnel or event stakeholders can be very useful in moderating the review process since they do not bring real or perceived bias into the process.

Finally, all of the observations and insights are useless unless there exists some opportunity to incorporate recommended changes into the traffic management plan.

Tabletop Exercise

At its most basic level, a tabletop exercise can simulate what actions will be taken using only a limited number of people. The tabletop exercise may be held within the confines of a room, but there is still an opportunity for representatives of all participating stakeholders to take part. The tabletop exercise can be run by a handful of people who regularly manage travel for other planned special events occurring in their region and, therefore, know how stakeholders deal with other events. The participants take on roles such as the TMC operator or field personnel and state what actions they would take based on a scenario as it is presented and as it evolves.

One shortcoming of the tabletop is that not all of the participants, especially the front-line personnel, will take part in the exercise. This could mean that those who are playing the role of a traffic management team member might handle events differently than those who actually would take the actions on the day-of-event, or that actions might differ if there were interaction with other participants. It also means that the insights, questions and suggestions of these operational personnel are lost. One way this can be addressed, in part, is to have several tabletop exercises, which review portions of the plan with smaller groups. Having multiple tabletop exercises better accommodates the schedule of designated traffic management team personnel. These exercises can focus on that portion of the plan, which in turn, involves these individuals.

A tabletop may also miss outside influences that would be dealt with during an actual planned special event. For example, a TMC operator may be handling other activities during a special event such as an incident not associated with the event.

It should be noted that a tabletop exercise could be held prior to a more detailed exercise, which involves a greater number of people. In fact, a tabletop may identify problems which can be corrected prior to a more detailed exercise and allow a better simulation of what takes place.

Full-Scale Simulation

A full-scale simulation involves a larger number of people and takes place at various locations. During the exercise, actual communication takes place between participants including those at the planned special event site, TMCs, and in the field.

While the simulation tests elements of the traffic management plan, there is also benefit to throwing in a few *curveballs* to see how participants handle the unexpected. While a TMC, for example, may bring in additional staff to handle the added work-

load of the planned special event, there is a possibility of a major unexpected incident taking place at the same time as the event. In this instance, it may be impossible to follow all elements of the traffic management plan, and participants can be tested on how they identify priorities and decide what portions of the plan to follow or discard.

While a simulation will bring weaknesses to light, it is important that all those affected become aware of those weaknesses and work together on how to modify the plan, prior to the day-of-event, to minimize the weak spots.

An important part of the simulation is the *review* that follows. All those who participated in the simulation now have an opportunity to: (1) go over the simulation step-by-step, (2) compare it to the traffic management plan which was developed, and (3) modify the plan as appropriate. There are several reasons why it is important that all participants have an opportunity to critique the simulation. First, a problem may only be observed by one individual, yet that problem could affect the entire operation. Secondly, if the plan is modified, it needs to be discussed by all those who are affected. In the same way it is important for all pertinent stakeholders to have a role in developing the traffic management plan, it is important also for everyone to be aware of necessary plan changes and to note how those changes may impact their agency's operation on the day-of-event.

Equipment Testing

A wide variety of equipment may be used to manage travel during a planned special event. This includes communications equipment and equipment in the field, which supports the traffic management plan and helps the traffic management team manage the event. Equipment that may need to be tested includes:

- Center to center communications
- Center to field communications
- Changeable message signs (CMS), both fixed and portable
- Highway advisory radio (HAR)
- Closed-circuit television

While testing is no guarantee that equipment will work as expected, it is useful in identifying unknown problems and potential problems before the event. For example, if an event is taking place in a remote area, communication to field devices may be hindered by weak or nonexistent signals.

Stakeholders should consider testing for these types of problems as far in advance of the event as possible so that alternatives can be identified and developed. Other types of testing, such as the functioning of field equipment, should take place just prior to the event to make sure it will be working during the event.

During a planned special event, communications will often be routed from the command post at the planned special event site through the TMC, if present, to field personnel and others responsible for implementing various elements. Since the venue is at a location where transportation management activities may not normally take place, it is especially important that communication linkages between the venue and the TMCs work well. If radio communications are required, these should be tested on all frequencies expected to be used. If wired communications are installed, then they should also be tested. Back-up communication channels should also be tested in the event primary channels develop problems. For instance, cellular phone systems might be overloaded during an event that draws a large number of people, especially if a problem occurs during the event, which causes many event patrons to use their mobile phones.

Communication from the TMC to various field staff must also be tested. Again, some of these field personnel may be in locations not normally used during day-to-day activities, and this testing will verify communication can take place from the TMC to all field positions.

There are other pieces of equipment that are also important and these should be tested. For example, motorist information tools such as CMS and HAR may be used to transmit important information both to (1) those attending the event and (2) those who are traveling through the area and who stakeholders want to steer clear of the event. In many instances, portable CMS may be deployed. Communications from the TMC to the signs must be tested to make certain there are no problems updating the signs. Again, keep in mind that portable signs may use the same cellular phone frequencies that event patrons use and, as a result, communications that work during a simulation may not be as reliable during the actual event.

As with other elements of the traffic management plan, contingencies should be developed. If wireless communications are unavailable, what alternates are available? Can field personnel be deployed to manually adjust equipment? Do these individuals possess sufficient qualifications needed to operate the equipment? There are a host of questions that should be considered and tested.

PERSONNEL 

Overview

Traffic management plan implementation on the day-of-event involves personnel duties ranging from trivial tasks to responsibilities critical to the safety and mobility of transportation system users. A traffic management team comprised of supervisors and field staff having experience in assigned duties and responsibilities represents a key to successfully managing travel for planned special events. Experienced personnel should exist at all levels in the traffic management team hierarchy: interagency command, agency command, and field operations. However, supplementing experienced personnel with temporary staff and volunteers on the day-of-event also provides advantages that (1) reduce personnel cost as public agency personnel likely require overtime wages on the day-of-event, (2) permit public agencies to adequately meet other daily staffing requirements, and (3) provide expanded control over transportation operations and greater convenience to event patrons.

In some cases, the amount of personnel required to implement traffic management plan strategies (e.g., traffic/pedestrian control, parking, surveillance) on the day-of-event, coupled with implementation plan assignments such as equipment delivery and installation, may exceed the staffing capabilities of agencies and contractors involved in managing travel for a planned special event. As a result, the recruitment and training of temporary staff and volunteers becomes paramount to the success of day-of-event operations. The effectiveness and ultimate success of a traffic management plan depends on the level of personnel (and equipment) resources available to implement the plan. A determination to use and train volunteers, or additional volunteers, may occur as late as after the completion of stakeholder simulation exercises and after stakeholders make final revisions to the traffic management plan and implementation plan.

Table 8-4 lists common personnel resource requirements on the day-of-event. The table indicates volunteers are better suited for non-essential activities, primarily because of experience and reliability concerns. Yet,

these activities contribute toward improved traffic and pedestrian flow within the venue site area. For instance, the deployment of field observers allows for data and information to be collected, processed, and transmitted in real-time to traffic management supervisors. Volunteers can facilitate improved operations at mode transfer points, such as shuttle bus stations and pick-up/drop-off areas. Public agency stakeholders do not have the resources or budget to assign paid staff for every activity supporting traffic management plan implementation. These stakeholders, coupled with private contractor support, can instead work to supervise teams of volunteers charged with traffic and pedestrian management support tasks.

This section focuses on tasks associated with the use of volunteer personnel in managing travel for planned special events. As emphasized in this and previous chapters, stakeholders have the responsibility of assigning staff experienced in handling challenging tasks that comprise a particular traffic, pedestrian, or parking management strategy. While some experienced personnel may not have worked a planned special event in the past, they have performed the same or similar task(s) on regular basis as a result of day-to-day responsibilities or response to other events (e.g., traffic incidents and roadway construction activities). For instance, the actions involved in programming a CMS or HAR during a planned special event does not change from its use in other situations. The stakeholder simulation exercises described in the previous section represent training for experienced personnel on managing travel for a particular planned special event. In contrast to experienced personnel, many volunteers have no past experience in managing travel for planned special events, nor do they have experience in tasks associated with traffic and pedestrian control and parking operations.

Table 8-4
Day-of-Event Personnel Resource Requirements

ACTIVITY	EXAMPLE TASKS	RECOMMENDED PERSONNEL
Event transportation services	• Operate shuttle bus.	Experienced personnel
Active traffic and pedestrian control	• Manage competing traffic and pedestrian flow.	Experienced personnel
Passive traffic control	• Monitor barricades and other traffic control devices. • Guide traffic or pedestrian flow (e.g., pull-through).	Volunteers
Parking operations	• Guide vehicles through parking area access point. • Process vehicles at parking area gate. • Park vehicles.	Experienced personnel and volunteers
Operations monitoring	• Monitor parking area occupancy levels. • Observe traffic and pedestrian operations. • Collect performance evaluation data.	Experienced personnel and volunteers
Crowd control	• Prevent overcrowding and vehicular/pedestrian conflicts.	Experienced personnel
Event patron assistance	• Disseminate directions at mode transfer points. • Provide support at shuttle bus stations.	Volunteers

Volunteer Recruitment

Prior to initiating volunteer recruiting efforts, event planning team and/or traffic management team stakeholders must determine the number of volunteers needed. This represents a function of the number of potential volunteer work assignments and number of available volunteer supervisors. An alternative approach to recruiting after traffic management plan development involves: (1) soliciting the public, through event advertisements, for volunteers early in the event operations planning phase and (2) developing a volunteer contact list for later reference as conditions warrant. The list may also indicate the type of work task(s) favored by each volunteer. Event organizers or traffic management team supervisors should obtain written confirmation from stakeholders that personnel resources pledged during the event operations planning phase will be available on the day-of-event.

A key consideration in supervising volunteers, or any personnel, involves maintaining good span of control. Incident Command System guidelines suggest keeping the span of control between three and seven persons reporting to a supervisor with one supervisor per five subordinates as a rule of thumb.(1) A supervisor should represent an agency or contractor involved in planning and managing a particular planned special event. The supervisor should also have full knowledge of the duties and responsibilities of each subordinate, and supervisors may train the particular volunteer group that they have been assigned to lead on the day-of-event.

Volunteer recruiting and associated training activities result in volunteers knowing their respective work assignment prior to the day-of-event. Because different special event work assignments peak varying levels of interest among volunteers, stakeholders should recruit additional volunteers for certain low-interest assignments. For example, most volunteers do not like parking assignments; therefore, overkill in volunteers stationed at parking areas represents a good tactic.(2) This avoids a potential shortfall relative to volunteers not showing up for work on the day-of-event.

Various perks can improve and speed-up the volunteer recruiting process. Stakeholders should consider providing volunteers with (1) free public transportation to and from the event venue site and (2) free food and beverages while on shift. Table 8-5 summarizes other rewards for volunteer service.

Table 8-5
Example Rewards for Volunteer Service

REWARD
• Free admission to the special event
• Tickets to a future venue event
• Permission to keep work uniform
• Recognition gift or dinner
• Drawings for substantial prizes

Training Activities

Training for volunteers and temporary staff ensure these personnel: (1) understand the traffic management plan component governing their assignment, (2) disseminate accurate information to event patrons and supervisors, and (3) understand traffic management team operations protocol. Training involves the distribution of reference material, pre-event seminars, or both. Reference material should detail specific duties and list volunteer report time, roll call location, shift duration, and supervisor assignment. A day-of-event checklist would assist volunteers in identifying and remembering items (e.g., proper clothing, sunscreen, sunglasses, reference guide, etc.) to bring for their shift. Volunteers also would benefit from carrying an event transportation and parking guide or

fact sheet for quick reference when assisting event patrons. Such reference guides contain information on key traffic management plan provisions, particularly those that contrast normal transportation system operations in the vicinity of the event venue.

Table 8-6 lists general volunteer training activities. Since most volunteers do not possess relevant experience in managing transportation and parking operations, training activities should address all of the potential decision-making scenarios that volunteers may encounter in addition to day-of-event communications.

Table 8-6
General Volunteer Training Activities

ACTION
• Discuss traffic management team chain of command.
• Summarize job training and required duties.
• Schedule review.
• Present examples of typical and contingency scenarios and how volunteers should react.
• Provide background in customer service.
• Describe field communications infrastructure.
• Discuss proper radio communications protocol.
• Explain types of parking area permits and event passes.
• Discuss strategies for accommodating persons with disabilities (e.g., review disabled accessible routes and site facilities).
• Review security guidelines.
• Review guidelines for interacting with the media.
• Indicate transportation information and alternatives for volunteer access to event venue site.

The traffic management team may supply some volunteer staff with a handheld, two-way radio for volunteer-to-volunteer and volunteer-to-supervisor communication. Compared to cell phone use, two-way radios allow all pertinent personnel, including those at the command post, to hear one message. Volunteers should receive written and verbal instruction, including sample conversations, on radio protocol that includes: (1) how to make and receive a call, (2) common radio terminology, (3) making priority or emergency calls, and (4) conditions warranting a priority call. Volunteers also should know how to use all radio functions.

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2. *U.S. Olympic Festival 1989 After Action Report: Transportation, Planning, Coordination and Operations*, BRW, Inc., Oklahoma City, Ok., October 1989, 35 pp.

CHAPTER NINE
DAY-OF-EVENT ACTIVITIES

Figure 9-1
Traffic Management Team Day-of-Event Interaction

PURPOSE

The purpose of this chapter is to discuss the actual implementation and operation of the traffic management plan during the day-of-event. This constitutes the fourth phase of managing travel for planned special events. The chapter covers several areas, including sections on the *traffic management team*, *communications*, and *traffic monitoring*. This information allows the transportation management center (TMC) staff and traffic management team members to gain an understanding of how the Incident Command System (ICS) can be used for managing travel during planned special events and provide guidance on setting up a communications framework for planned special events transportation management.

INTRODUCTION

During the advance planning process, countless meetings were attended, numerous hours were spent developing and reworking the traffic management plan, and every contingency was considered. Now, the day is here and it is time to implement and operate the plan.

This chapter looks at what happens on the day(s) of the event. Not only do the requirements of the traffic management plan have to be considered, but also it is essential

to monitor what can be a very fluid situation to see how the plan is working and then determine what needs to be adjusted based on real-time traffic conditions.

Always expect the unexpected and be ready to handle that unplanned situation. Assess the adequacy of the established communications structure and determine if it is possible to deploy what is needed in a timely manner.

While there is no way to be certain until it happens, this chapter provides tools that will help practitioners deal with and manage all that might happen on the day-of-event.

Table 9-1 lists the key day-of-event activities.

Table 9-1
Day-of-Event Activities

ACTION
• Implement a management process for the traffic management team.
• Designate a multi-agency command post.
• Conduct a traffic management plan evaluation(s) during the day-of-event.
• Establish protocol for traffic management team officials to consider and implement changes to the traffic management plan to accommodate real-time traffic conditions.
• Establish interagency communication protocol.
• Review communication equipment compatibility.
• Use the media to communicate with event patrons and other transportation users.
• Perform traffic monitoring on the day-of-event.

TRAFFIC MANAGEMENT TEAM

Stakeholder Roles and Coordination

The traffic management team includes not only many of those stakeholders that have been involved during the event operations planning phase, but all those who may be involved for the first time on the day of the event. This includes other event support stakeholders, other stakeholder representatives, and volunteer personnel. Table 9-2 lists typical stakeholders involved in day-of-event activities.

Table 9-2
Traffic Management Team Stakeholders

STAKEHOLDER
• Traffic operations agency
• Transit agency
• Law enforcement
• Public safety
• Event organizer
• Transportation consultants
• Traffic control contractors
• Emergency management agency

A planned special event represents a source of non-recurring congestion where, similar to a traffic incident, stakeholders must adopt a formal management process to ensure successful traffic management plan deployment and minimal impact to transportation system users. The Incident Command System can be used to handle traffic management during planned special events. The ICS organizes and coordinates multi-agency response to an incident by establishing responsibilities and lines of authority. An Incident Commander has overall responsibility for managing the planned special event. Depending upon the size of the event a number of individuals will report to the Incident Commander. A key to the ICS is that the reporting relationships be kept to a manageable size. If the number of people reporting to a single individual grows too large, another layer of command should be added.

Unified Command represents an ICS management process that functions to coordinate inter-jurisdictional and multi-disciplinary

stakeholders comprising the traffic management team without sacrificing agency authority, responsibility, or accountability. Figure 9-2 displays an example of a Unified Command organization for managing travel for planned special events. The Unified Command hierarchy includes the Incident Commander serving to coordinate and manage the activities performed by stakeholders classified under the following organizational elements: branches, groups, and units. A branch agency manages a specific operational function. For example, a law enforcement agency is responsible for traffic control and pedestrian accommodation. Group agencies manage and execute specific functional activities. Units execute specific functional activities. For instance, a private towing company is responsible for removing illegally parked or disabled vehicles.

Per Unified Command protocol, if an unexpected event happens during the planned special event, a transfer of command may occur. The decision to effect a transfer of command depends on the qualifications and experience of all on-site branch agency supervisors relative to that of the acting Incident Commander. For example, if a severe weather event took place during a planned special event, an emergency management agency official may assume the role of Incident Commander.

An advantage of using the ICS during a planned special event is that it clarifies how decisions are made if the traffic management plan requires adjustment. Unexpected events may necessitate adjusting the plan to meet changing circumstances. In this instance, there may not be the luxury of meeting with all stakeholders to develop a consensus on how to modify the plan. The Incident Commander should have the authority to make those adjustments that are needed.

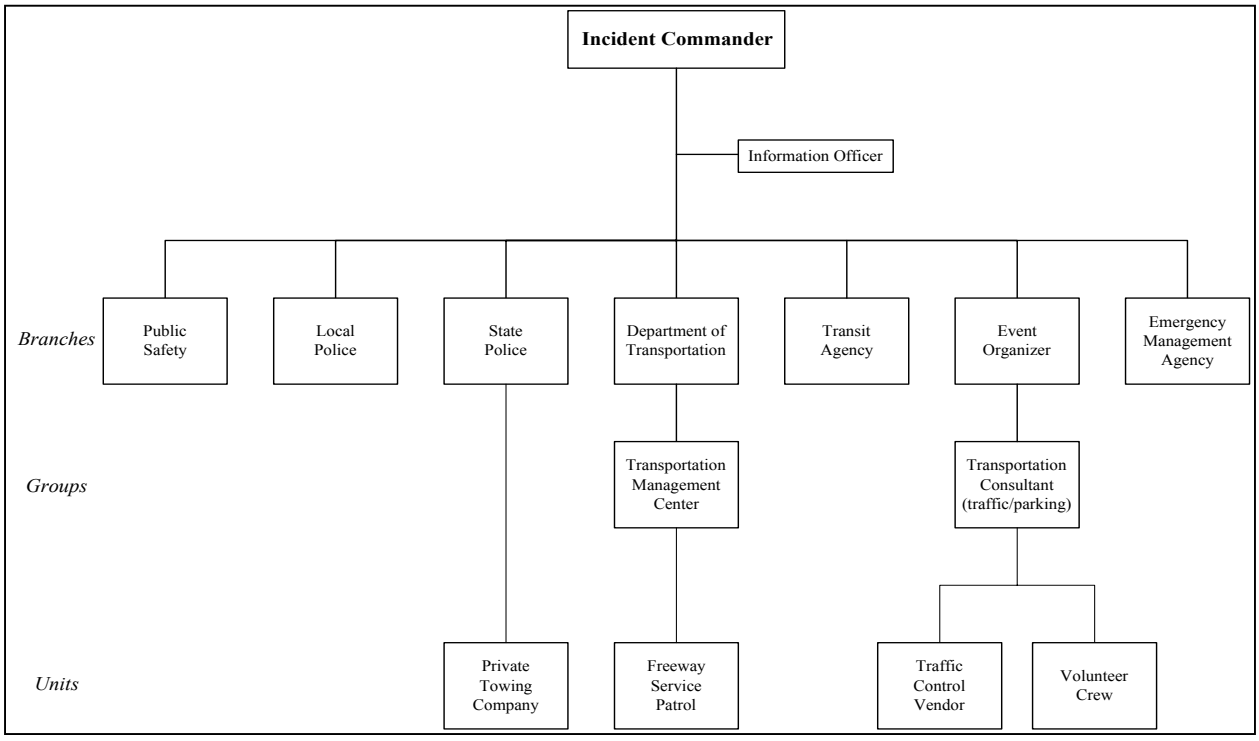

Figure 9-2
Unified Command Organization for Planned Special Events

Team Management

Typically for a planned special event, a representative of a law enforcement agency will take on the role of Incident Commander. Representatives of various agencies will, in turn, report to the Incident Commander. Among those working under the Incident Commander will be one or more transportation representatives. A lead person should be identified for each agency responsible for part of the traffic management plan. Among those who may be a part of the transportation team are representatives from the state department of transportation, local traffic agencies, toll agencies and transit agencies. Depending upon what is worked out in the event operations planning phase, all of these individuals may be represented by a single Incident Commander (e.g., transportation commander) or by individuals representing each of their respective agencies.

Command Post

The ICS will most likely be used in a multi-agency command post. Figure 9-3 shows a command post established at a freeway rest area for a major rural planned special event in Wisconsin. This will probably be at or near the venue where the planned special event takes place. Again, depending upon the size of the event, secondary command posts may exist. These secondary command posts may take on specific areas of responsibility, such as law enforcement or traffic control. Regardless of where the command post is located, or if it is located in multiple locations, the same principles of incident command will apply. An Incident Commander will still have overall responsibility for managing the event. What may differ, if there are secondary command posts, is how communications are handled to and from the Incident Commander.

In some instances, a permanent TMC may serve as the primary command post. The advantage of using the TMC is that many of the communications resources and other needed tools are already in place. If the TMC is used, the ICS should still be employed if multiple agencies comprise the traffic management team. This operation would likely differ from typical activities in the TMC, given the presence of multiple outside agency representatives. In the event

Figure 9-3
Planned Special Event Command Post *(Photo courtesy of the Wisconsin DOT.)*

operations planning phase, the ICS would be used to identify who is the Incident Commander at the TMC and how activities are coordinated within the TMC during the event.

Advantages of a single command post include: (1) key agencies are represented in a single location and (2) communications among agencies are simplified.

An advantage of secondary command posts is that event management can be more easily switched if a problem develops at the primary command post.

Resource Planning

The plan developed for the resources needed for the event represent the collected best opinion on what is needed. Resource planning involves the following two parts: (1) determining the scope and amount of resources that will be used on the day-of-event and (2) identifying resources in advance in case the traffic management team needs more resources than planned to implement the traffic management plan.

The most important resource that stakeholders must plan for involve personnel resources. Planning considerations include:

- What type and quantity of skilled personnel are needed?
- Where should personnel be deployed?
- What responsibilities will individual personnel have?

Most day-of-event field personnel will work in areas different from their normal, day-to-day work location. Relief for personnel may be more difficult to obtain because of agency constraints, and relief assignment should be part of personnel planning. Field personnel may require frequent breaks in difficult weather conditions, and traffic management team officials may have to substitute back-up staff if planned relief is not available.

The operation of planned special events on the day-of-event includes three phases: ingress, the event itself, and egress. Resources need to be available for all three phases with emphasis on ingress and egress. The traffic management team will likely need fewer personnel for traffic management during the event, and part of the planning should include what level of staffing is needed during this period. Depending on the length of the event, a second shift may report to handle egress. If a first (ingress) and second (egress) shift exists, traffic management team officials can stagger work times (e.g., first shift individual reporting later and leaving later or second shift individual reporting early and leaving early) to maintain sufficient personnel on-site during the event. Another consideration concerns how quickly staff and other resources can be deployed incase the event ends sooner than expected, thus causing early departures.

Managing Traffic

While the traffic management plan and supporting implementation plan notes how stakeholders expect to manage traffic, the actual management of traffic on the day-of-event may differ from what the plan calls for. Traffic incidents, changing weather conditions, and other unexpected events can all cause the traffic management plan to be modestly modified or completely changed. After safety, successfully managing traffic represents the reason why stakeholders developed the traffic management plan in the first place and that goal must remain paramount.

For this reason, it is important that involved stakeholders understand that the traffic management plan provides guidance but is not an ironclad law that must be followed regardless of what takes place on the day-of-event.

As part of the traffic management plan, various scenarios can be addressed from best case to worst case, together with likely variations. Having different scenarios and response plans specified in the traffic management plan will help managers more quickly respond to changes. Again, not every variation can be noted, but experienced staff can modify what the traffic management plan calls for.

When done well, managing traffic is done on a proactive basis, anticipating what will happen next and reacting before problems cascade. Like an orchestra conductor, the traffic managers are calling on different elements to play as the event proceeds. A traffic queue in one area will require adjustments to signal timing on primary and alternate routes. Traffic incidents not only require response to the site of the incident but the activation of appropriate messages on roadside traveler information devices.

As a general rule, drivers tend to be more understanding about a congestion delay if they are informed of what is taking place and are assured steps are being taken to mitigate the problem.

To properly manage traffic, the managers need timely and accurate information. Staff in the field must understand the importance of the information they provide, and staff at the command center must help the managers understand the information coming in, such as pointing out what is most important. Too much information without some interpretation is almost as worthless as too little information.

Other staff should be on hand to assist with other activities taking place in the command center. This includes handling VIPs, disseminating information to the media, and addressing routine items such as equipment problems.

Evaluation Activities

Although many hours have been spent creating the traffic management plan, the plan should remain flexible with the ability to modify and enhance it with necessary changes based on real-time traffic conditions. Updates can continue through the course of the planned special event, accounting for new situations and unexpected events. Evaluation of the plan is an ongoing activity during the event, and participants should contribute their insights as they witness the event unfolding. The traffic management team must be open to modifications of what had been agreed to during the event operations planning and implementation activities phases.

Table 9-3 indicates key traffic management plan evaluation activities on the day-of-event.

There are several different ways to accomplish this evaluation and revision process:

- Some modifications will be minor in nature and will not require significant discussion. For example, moving a traffic post may be a simple change that improves the flow of traffic. The Incident Commander may have authority to make such a change.

Table 9-3
Traffic Management Plan
Evaluation Activities

ACTION

• Establish briefing schedule and location (e.g., command post).
• Identify ranking representative of each stakeholder agency participating in briefings.
• Conduct day-of-event briefing.
  o Situation status
  o Objectives and priorities
  o Current organization
  o Personnel and equipment resource assignments
  o Communications
  o Concerns and related issues
  o Recommended changes
• Achieve consensus on recommended changes.

- A more significant change, such as the route of buses to the venue site, involves a greater number of agencies and individuals. These changes need to be discussed before being implemented to make certain everyone affected is aware of the change so that any concerns with the proposed change are addressed and overcome.
- If the suggested change is urgent, a quick discussion among the agencies involved may suffice.
- If it is not urgent, the modification can be discussed during a regularly scheduled meeting of the stakeholder representatives.

How and if these meetings are scheduled can vary depending upon the dynamics of the planned special event:

- If the event is small in scale and only a few agencies are involved, there may be no need for scheduled meetings. Revisions can be easily discussed among participants at the command post.
- On the other hand, large events involving many stakeholders would require meetings to discuss: (1) what has taken place, (2) what lies ahead, and (3) what changes are recommended.

If scheduled meetings are planned, the next question is when to hold these meetings:

- If the event stretches over several days with a clear end time each day, it is logical to conduct a meeting at the end of each day's activities. At this point, the participants will not be distracted by managing the event, and they will have the benefit of their experience that day to decide what should be revised.
- If the event is longer, perhaps even running around-the-clock, regular meetings can be scheduled during expected lulls in activity. These meetings may be specifically scheduled in anticipation of key activities, such as the egress of event patrons.
- For events where a shift change is needed in the command center, a meeting of the crew, or crew supervisor, going off-duty may be helpful so they can recommend changes to those relieving them.

Many of the same procedures used during the creation of the plan can be used to make revisions during the event. Those involved discuss the changes, call for input from those directly affected, and agree on what will be done. It is important that any changes be communicated to all involved. Major problems can develop if one group is operating under old assumptions. In many cases, having a computer and printer available will make updates easier to share. If the plan is in a notebook or manual form, the revised section can just take the place of the old section. Participants should note on the revised plan that it represents an update and when that revision was made. This makes it

easier to track changes and make certain everyone is operating with the same information.

COMMUNICATION 

Structure and Protocol

In most areas of the country, interoperable communications, in which all agencies are able to communicate on a common radio frequency, is not yet a reality. That being the case, it is necessary for a communication structure and protocol to be established. As shown in Table 9-4, the structure should include the noted primary considerations.

Table 9-4
Communications Structure
Primary Considerations

CONSIDERATION
• What radio channels or frequencies will be used. • Who will use these channels. • Will a common lexicon be used for communications.

Whatever frequency is used, it is important that all those who must use it be able to access the channel and that coverage include all areas where operations will take place.

In some cases, operating on a common frequency may require the distribution of radios to some of the stakeholders. In some instances, agencies have used cellular phones with a push-to-talk feature to provide a common channel during an event. Some agencies may already have these handsets and use them for day-to-day operations. One or more special talk channels can be established for use during the planned special event to allow only traffic management team members to be on the air. Table 9-5 lists the advantages of using this type of system.

Table 9-5
Advantages of Operating on a
Common Frequency

ADVANTAGE
• Most of the infrastructure is provided by a private company. • Coverage can be achieved over a wider area than some individual agencies enjoy. • Agencies' normal channels are freed for regular operations. • Other frequencies are not jammed with transmissions related to the planned special event.

Another important part of the protocol involves using *common language* on a multi-agency frequency. Many agencies use verbal shorthand in the form of codes when transmitting. These codes work well when used by those who know them, but when other stakeholders are involved, the codes can be a source of confusion and miscommunication. An increasing number of agencies are now using clear language protocols on their radio frequencies, and these standards should be followed if multiple agencies have to communicate with one another. Clear language simply says that commonly understood words and phrases are used instead of codes. For instance, instead of calling an accident a Signal 11, the crash should be called an accident on the radio.

Interagency Communication

Since multiple stakeholders are involved, it is critical that they be able to communicate with one another on the day-of-event:

- The most basic, and least desirable, form of interagency communication involves messages being relayed indirectly from one agency to another. An example could include a police officer in the field wishing to coordinate a road closure with the DOT. The officer radios the in-

formation to a dispatcher who, in turn, calls the dispatcher at the DOT. The DOT dispatcher then radios the crew in the field. Coordination might take several messages being sent back and forth through this chain. This form of communication delays the sharing of information and is subject to miscommunication.

- As noted in the previous section, operating on a *common channel* with *clear language* greatly improves interagency communication. Depending upon the size of the planned special event, more than one channel may be used. For example, one channel could be deemed as the primary channel, which is used by all participants for the sharing of critical information. Another channel may be dedicated to transportation concerns.

To minimize confusion and extraneous information being shared among agencies, the question of who will use which frequencies should be decided during the planning process. Stakeholders should understand: (1) how they can reach other traffic management team members during the event, (2) which channels they will be found on, and (3) what information should be shared.

Since many of the stakeholders comprising the traffic management team may not be accustomed to interagency coordination, they should understand the importance of sharing information with their interagency partners. Information not shared with others who are affected could lead to difficulties managing traffic and cause mistrust among participating stakeholders.

Equipment

The participating agencies may normally operate on a wide variety of systems. VHF, UHF, and 800 MHz trunked systems are among those in common use, and agencies cannot normally communicate from one system to another. Before the right equipment can be identified, it is important for the stakeholders to understand what they want the communications system to do. Is it simply a means to share information, or does real-time coordination have to take place? Who has to operate on the channel? Where will they be located? Once these questions are answered, it becomes possible to identify the appropriate equipment to use for the event.

Table 9-6 lists several levels of communication that must also be studied. First, there is communication within the venue. In this relatively small area, a radio system that provides coverage just in the area of the venue may be sufficient. Hand-held units may be given to personnel who have to coordinate at the site. Communications may take place between individuals or between field staff and the command post.

Table 9-6
Levels of Communication

COMMUNICATION LEVEL
• Within the venue
• Between individual stakeholders
• Between field staff and command post
• Between command post and TMCs

Another level of communication would be between the command post and the TMCs. Here it may be more difficult to identify the best equipment to use. The TMCs may be geographically distant from each other and the command post. Because the centers are inside buildings, and often on lower floors, radios without an external antenna may not be able to reach all the participating stakeholders. In order to depend upon these communication channels, it is important that they be tested before the event. If no radio

communication is practical, a hardwire connection may be needed. In some TMCs and command centers, phone jacks are installed to allow dedicated phones to be deployed for events.

A trunked radio system provides what is needed for interagency communication during a planned special event. Other agencies, which also operate on a trunked system, may be able to modify their units to operate on a common frequency. A trunked system also allows a dedicated channel to be set aside for the event. Those agencies without the proper equipment can be loaned radios, which allow them to operate on the common channel.

Interacting with the Media

The media is an important part of the planned special event. If the event involves a lot of people, it also is a news story and the media will want to cover it like any other story. The media can also be an important part of traffic management plan implementation. Table 9-7 indicates how the media can be used to communicate with event patrons and other transportation system users.

Table 9-7
Use of Media

BEFORE EVENT
• Identify preferred routes. • Identify approved parking areas. • Identify transit alternatives. • Identify locations where event patrons can obtain travel information on the day-of-event.
DURING EVENT
• Warn people ahead of time about the routes they should take. • Advise of available options. • Alert drivers about problems, delays, and blockages. • Suggest actions travelers should take.

Communication with the media should start before the event. If there is pre-event advice that stakeholders wish to disseminate, then the media can be a conduit to the public.

During the event, the media can be used to provide real-time updates about transportation system delays and blockages. Again, advice on how to avoid the delays can be provided.

Most agencies already have some forms of communication in place with the media. However, these may not be the best way to communicate during the planned special event. For example, many agencies work with traffic reporting services during periods of recurring congestion. The planned special event may be taking place on a weekend or holiday when the traffic reporting service is not in service. Alternate means to get real-time information to broadcasters may be needed.

The media may also find that the usual means they use to get traffic information are unavailable during the planned special event. Due to security concerns, airspace near the site may be off limits. This makes the media more dependent upon the agencies to provide them with updates.

Unless a proactive decision is made otherwise, most agencies would not want the media to call the command post for updates. Calls to and from the TMC may be the best way to get information to the media. Wherever the media are directed to call, it is important that the person handling those calls has the most up-to-date, accurate information available. For the media to trust this source, they must believe that this is the best place to get information. Since most media want to verify information on their own, agencies should be prepared for the media to

seek out other sources. The media may also acquire information via cell phones from event patrons driving to the planned special event, and the media will want to verify the information the public provides with the transportation agencies. If trust is lost between the media and the agencies, the agencies may lose control of the flow of information.

Traveler Information Dissemination

Traveler information will have two important audiences during the event: (1) those who plan to attend and (2) those who want to avoid the delays the event may cause. In both cases, traveler information tools can be used to effectively disseminate information.

Table 9-8 presents various pre-trip and en-route traveler information dissemination methods.

Table 9-8
Traveler Information
Dissemination Methods

METHOD
• Newspapers and printed material
• Radio and television
• Internet (e.g., websites and e-mail)
• Changeable message signs
• Highway advisory radio
• Telephone information systems (e.g., 511)

The dissemination of traveler information begins before the event with warnings of what may occur, preferred routes to the site and around it, and where drivers can get updates on the day-of-event. Different tools lend themselves to particular uses. Newspapers and other printed material, for example, lend themselves to graphic information such as maps. The Internet represents a powerful medium for disseminating pre-trip travel information to event patrons and other transportation system users. Figure 9-4 shows a Seattle Department of Transportation web page detailing specific planned special event traffic impacts and multi-modal travel options.

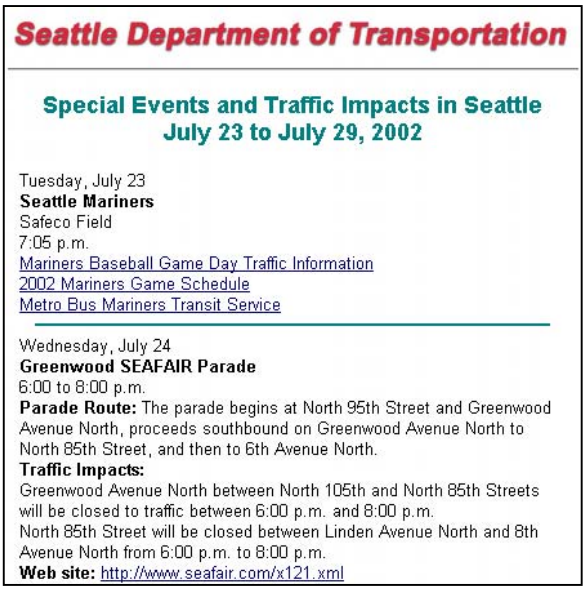

Figure 9-4
Internet Traveler Information *(Graphic courtesy of the Seattle DOT.)*

Changeable message signs function best to raise awareness of a potential problem while road users are en-route, and highway advisory radio is somewhere in the middle, being able to provide more detail than signs, but less than printed material. The planned special event is likely to require the deployment of portable changeable message signs because a greater concentration of information is needed and because the event may be taking place in a location where permanent devices are not in place. Portable highway advisory radio stations may also be considered to reach motorists.

In planning for the event, stakeholders must consider: (1) which devices will be used, (2) approved messages that can be displayed,

and (3) how to disseminate the information to event patrons and other transportation system users.

The growth of 511 services represents another important avenue to disseminate information. As 511 becomes more well known and more widespread, travelers are more likely to think about dialing 511 before they go or while they are en-route to get the latest information. Even where 511 is not yet in use, other recorded telephone services can be used.

No one system will reach all of the people that stakeholders wish to alert. In fact, even if all systems are used, operators will not reach every transportation system user. But, by using a variety of tools, the traffic management team will be able to reach a critical mass of people so that delays will be minimized and the customer requirements of all users satisfied.

On the day-of-event, it must be clear who will update traveler information devices and how timely and accurate information will get to the officials responsible for providing the updates. These individuals must be part of the communication chain. Again, assigning a dedicated person to handle the updates would be ideal. Conflicting priorities could result in out-of-date information being disseminated if one person is asked to handle too many tasks.

TRAFFIC MONITORING

Traffic monitoring represents an important day-of-event activity, serving to provide traffic and incident management support in addition to performance evaluation data. Timely deployment of contingency plans developed during the event operations planning phase depends on the accurate collection and communication of real-time traffic data between traffic management team members. This section describes how traffic monitoring activities support real-time traffic management and control decisions during the day-of-event.

Purpose

Agencies responsible for managing planned special events require numerous types of information on the current conditions of the system to support delivery of effective service for the planned special event. This required information varies widely depending on: (1) the service being provided, (2) how often it needs to be collected, and (3) how accurate it needs to be (e.g., for traffic control and traveler information purposes, simply knowing whether pavement is wet/icy or not may suffice; for purposes of managing snow and ice control activities, more detailed information is required).

Information is crucial for successful operations of the transportation network. As noted in an FHWA TEA-21 reauthorization proposal: "Operating the highway system to achieve security, safety, and reliability objectives requires an ability to know what is happening on the system. Real-time information on highway system performance and weather conditions / events is vital to assist highway professionals in managing the available capacity, responding to disruptions to capacity (including emergencies, evacuations, and security threats), and to system users in planning the timing, mode, and route for their trips." In essence, the many benefits of the various planned special event management strategies cannot be fully realized unless practitioners are aware of the real time conditions on the highway network.

Traffic Management Support

In a traffic management system, the traffic monitoring component, or surveillance component, is the process in which data is collected in the field. This data is used to supply information about conditions in the field to other system components including personnel located in the field on the day-of-event. Surveillance provides the information needed to perform the functions identified in Table 9-9.

Table 9-9
Use of Surveillance Information

FUNCTION
• Measure traffic and environmental conditions in real-time.
• Make control decisions.
• Disseminate traveler information.
• Monitor and evaluate system and plan performance.

Surveillance is not limited to collecting and monitoring traffic condition information alone, nor in some instances are they automated in nature. Surveillance is applied to weather and pavement conditions to provide operators and maintenance staff more information to support their traffic and transit management responsibilities. These systems also are being used to manage snow removal, icy roadway treatment, to detect limited sight distance problems caused by fog or smoke, and to detect high water levels along roadways. While much traffic surveillance (detection) is accomplished via automated means, manual detection, most notably via in-field personnel on cell phones or two-way radios and cell-phone calls from motorists, is a viable and reliable strategy for planned special event management. In many instances of planned special event management, the surveillance must be microscopic rather than macroscopic, i.e., a particular point or location must be monitored rather than an area or region, and this strategy of manual detection is the most cost-effective and efficient.

Various technologies that exist for collecting this information are described in Table 9-10.

Table 9-10
Data Collection Methods

METHOD
• In-roadway and over-roadway sensors for measuring traffic flow parameters
• Vehicle probes for collecting data on travel times and origin-destination information
• Closed circuit television (CCTV) systems for viewing real time video images of the roadway
• Road weather information systems (RWIS) for gathering information on pavement and weather conditions
• Traffic signal and system detectors to measure congestion on streets
• Parking management systems to monitor available capacity in parking garages or lots
• Manual methods

Detection and surveillance, whether highly technical and automated or simple and manual, is the cornerstone of traffic monitoring. Traffic management strategies and Intelligent Transportation Systems (ITS) technologies can assist in reducing congestion, improving safety, and enhancing mobility. However, without the capability to know the current operating conditions, coupled with the cooperation and coordination among personnel in the responsible agencies, the potential benefits of these strategies and technology systems may not be realized. To that end, it is not a simple matter to quantify benefits from detection and surveillance alone, but instead to understand the benefits realized from traffic management strategies and ITS technologies that rely on detection and surveillance. Some benefits of particular importance are noted in Table 9-11.

Table 9-11
Benefits of Detection and Surveillance

BENEFIT
• Reduction in delay and congestion related to early detection and verification of incidents. • Reduction in secondary accidents as a result of early incident detection. • Reduction in capital (e.g., salt) and recurring (e.g., plow crews) costs associated with snow and ice removal with the use of Remote Weather Information Sensor technology. • Improved traveler information.

The information collected through the monitoring effort is valuable for post-event activities. After the event, the information gathered and/or observed can be used as part of the program or event evaluation. The data collected provides: (1) input into estimating the benefits of the traffic management plan and operation and (2) input into planning for future planned special events. An example of some statistics or measures that can be obtained from traffic monitoring on the day-of-event, and can commonly be used to evaluate the effectiveness of the event traffic management plan and operation includes:

- Reduction in delay
- Change in mode
- Increase in transit ridership
- Reduction of travel time
- Increase in travel speed
- Reduction in loaded cycle lengths at signalized intersections

In summary, most of the benefits realized during planned special events results in some way from the real-time information provided by traffic monitoring.

Performance Evaluation Data

Performance measures provide the basis for identifying the location and severity of problems (such as congestion and delay), and for evaluating the effectiveness of the implemented planned special event management strategies. Table 9-12 indicates uses of this monitoring information. In essence, performance measures are used to measure how the transportation system, and therefore the traffic management plan, performs with respect to the adopted goals and objectives, both for ongoing management and operations of the special event and the evaluation of future options.

Table 9-12
Traffic Monitoring Information Uses

USE
• Track changes in system performance during the event. • Identify locations or corridors with poor performance. • Identify potential causes and associated remedies (i.e., contingency plans). • Identify specific areas that require improvement/enhancements for future events. • Provide information to decision-makers and the public. • Provide input to post-event evaluation.

Most measures for planned special event management are congestion-based and are measures that can be quickly and efficiently assessed. Table 9-13 indicates key performance evaluation measures. Certainly other non-transportation measures are important to successful planned special event management; however, these are neither accurate nor timely enough to allow for day-of-event management.

Table 9-13
Performance Evaluation Measures

MEASURE
• Parking occupancy and turnover rate
• Arrival and departure service rate at parking area access points
• Time to clear parking lots
• Vehicle delay at intersections
• Queue length
• Travel time and delay on freeways and streets
• Traffic volume to capacity ratio
• Traffic speed
• Number and location of crashes and other incidents
• Traffic incident clearance time

Table 9-14 lists some of the reasons that agencies have instituted performance measures and the associated monitoring and evaluation processes.

Table 9-14
Reasons for Traffic Monitoring and Evaluation

REASON
• Provide better information about the transportation system to the public and decision makers (in part due, no doubt, to a greater expectation for accountability of all government agencies).
• Improve management access to relevant performance data.
• Improve agency efficiency and effectiveness, particularly where demands on the transportation agency have increased while available resources have become more limited.

In managing travel for planned special events, a direct relationship exists between the performance measures selected and the data needed in the performance measurement process. The data and information used in decision-making must be of high quality because the remedies have to be performed immediately. They must originate from reliable, consistent sources and meet the needs of the decision makers. Moreover, the decision makers must have confidence in the information, or it will not be used.

The most common data problems are acquiring the required information in the exact form desired, and in ascertaining the quality of the data. The ''garbage in, garbage out'' concept applies to the data used in a performance measurement system. If the data gathered are highly uncertain, then the conclusions drawn by converting those data into performance measures also will be highly uncertain and will have reduced value to interested stakeholders. For this reason, great care needs to be taken in data collection. In reality, however, some things either cannot be measured accurately or cannot be measured accurately at an acceptable cost and in an acceptable timeframe. Transportation agencies need to consider the uncertainty introduced by inaccurate data when taking action based on their system of performance measures, especially in planned special event management, where the modifications have immediate, and possibly disastrous, results.

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CHAPTER TEN
POST-EVENT ACTIVITIES

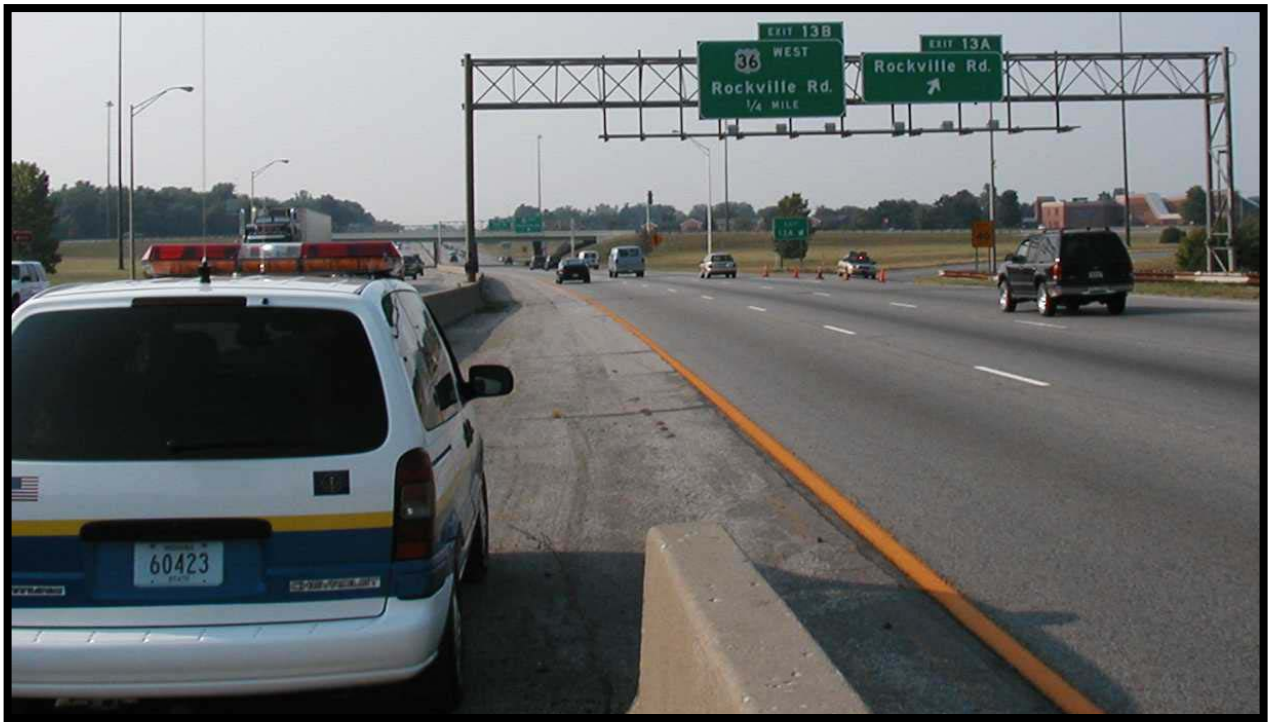

Figure 10-1
Field Observation of Traffic Management Plan Implementation

PURPOSE

This chapter covers the fifth and final phase, post-event activities, of managing travel for planned special events. It identifies pertinent activities that should be included in the evaluation of local and regional traffic operations for planned special events. This chapter presents an *evaluation framework* that describes advance planning considerations and the importance of evaluation in managing travel for planned special events, particularly the integration of data and findings into future planning activities for all planned special events in a region. This chapter also examines the three primary products of the post-event activities phase: *participant evaluation, post-event debriefing,* and *post-event report*.

INTRODUCTION

The last event patron has left the venue site, the command post is closed, and traffic has once again returned to normal. The traffic management team is finally finished with this planned special event…well, not really. Now comes the final phase of managing travel for planned special events, where participating stakeholders and volunteers can look back on what took place and evaluate what happened. While post-event evaluation may mark the final stakeholder activity for this special event, it should be consid-

ered as the first step in planning for the next planned special event. The program planning phase utilizes lessons learned and evaluation results from one planned special event to develop products, such as policies and regulations and permanent infrastructure deployment, for improving travel management for all planned special events occurring in a region.

No matter how thorough the traffic management plan, chances are excellent not everything happened as expected. Maybe it was an oversight or an unexpected glitch. Perhaps some elements worked better than expected, and it turns out that all the resources allocated were not needed. Whatever the case, the evaluation phase is where the plan should be compared with what actually happened and appropriate decisions be made as to what to do differently the next time. Even if the same planned special event was handled dozens of times previously, there are adjustments that can be made based on the most recent experience.

EVALUATION FRAMEWORK

Overview

The first steps in the evaluation of the traffic management plan implemented for the planned special event take place during the event operations planning phase. Knowing ahead of time that a post-event evaluation will occur allows participants to make provisions for the review. In particular, this means collecting data during the event, which can be used as part of the review process. At a minimum, this would include data indicating how the system performed and a log of what took place during the event. For example, Figure 10-2 shows technicians installing an electronic vehicle counter on an exit lane serving a parking area at a fair. Figure 10-3 shows a traffic management team member maintaining a log of freeway service patrol motorist assists during the day-of-event. Data collection activities also include surveying of event patrons and the public to get their perspective on how well elements of the traffic management plan worked.

Figure 10-2
Electronic Vehicle Counter Installation(1)

Figure 10-3
Maintenance of Freeway Service Patrol Assist Log

Table 10-1 summarizes key post-event activities.

Table 10-1
Key Post-Event Activities

ACTION
• Review measures of effectiveness identified in event operations planning phase.
• Compile agency measures of effectiveness.
• Compile performance evaluation data.
• Conduct stakeholder participant debriefing.
• Conduct event patron survey.
• Conduct public survey.
• Conduct a post-event debriefing meeting.
• Prepare a post-event report.

Measures of Effectiveness

Measures of effectiveness (MOEs) represent quantitative measures that give some insight into how effectively a unit is performing. MOEs are measures of activity that, while not reflecting performance directly, show workload and trends. To evaluate how well the traffic management plan worked, some form of measurement is necessary. In addition to telling stakeholders how effective their plan was, the measurements provide transportation professionals the means to demonstrate to others, including the media and elected officials, how well the plan may have worked.

There are two areas of effectiveness that should be measured, *internal* and *external*:

- Internal measures are actions taken by the traffic management team that may not be apparent to the public. For example, while the public would note a traffic incident being cleared, they would not be aware of the total number of traffic incidents handled.
- Examples of internal data, which can be measured, are indicated in Table 10-2.
- Internal measures are beneficial to stakeholders in helping them evaluate traffic management team activity.

Table 10-2
Internal Measures of Effectiveness

MEASURE
• Number of messages displayed on changeable message signs
• Number of messages broadcast on highway advisory radio
• Number of traffic incidents handled
• Number of messages transmitted between stakeholders
• Number of traffic signal timing changes
• Number of times a ramp(s) was closed and time/duration of closure(s)

- External measures are readily identifiable by the public during a planned special event. The volume of traffic on primary and alternate routes represent two examples.
- External measures are clearly experienced by most spectators attending a special event and are factors most likely to be noted by the public.
- External measures are likely to be viewed as more important by those outside the traffic management team, such as transportation system users and community interest stakeholders.
- Table 10-3 presents a list of external measures.

Table 10-3
External Measures of Effectiveness

MEASURE
• Volume of traffic on major routes
• Volume of traffic on alternate routes
• Volume of traffic entering and exiting the site and parking areas
• Hours of delay
• Number of event patrons and participants utilizing transit to and from the event
• Travel times
• Modal split
• Average vehicle occupancy

- Stakeholders may measure hours of delay by predefining what is considered congestion and noting how long the congestion lasts.
- While external measures provide hard statistics to demonstrate the plan's effectiveness, softer measures may also be beneficial. A survey of attendees may show how effective they perceived the traffic management plan. Their level of satisfaction with ease of access, quality of traveler information, and other activities can provide insights into how the users of the system view the effectiveness of the plan that was implemented.

Before deciding what to measure, it is important to decide how to evaluate the traffic management plan and the performance of the traffic management team. This decision may be driven, in part, by difficulties experienced during previous planned special events, political considerations, or a need to demonstrate the value of particular tools used during the event.

Integration with Program Planning Process

The evaluation must be more than an afterthought to gain the maximum benefit from it. As part of the program planning process, the evaluation should be considered from the initiation of the process through its conclusion. If the evaluation is being done for the first time, those who are putting the plan together have to look at the goals and then design the evaluation to measure whether the goals have been met.

If previous evaluations have been done, even if they were done for another event, the results of those evaluations should be examined before the traffic management plan is designed. In the case of an unrelated event, there may be some lessons learned that could be applied to this new event. If this is a recurring event, previous evaluations would have more specific insights that can be applied.

Since evaluation will be taking place throughout the planning process and during the event itself, it is important that the evaluation steps, goals and objectives be established during the program planning phase or early in the event operations planning phase for a specific planned special event.

Finally, as the event concludes, it is also important that a mechanism be created to take what is learned in the evaluation of a specific planned special event and put it in a form that allows the evaluation results to be applied to future events.

Application to Future Events

Whether the event is a one-time only happening or an annual occurrence, what has been learned through the evaluation can contribute toward proactively improving travel management for all planned special events occurring in a region.

To be beneficial for future planned special events, the results of the evaluation should be documented and made accessible. In the case of a one-time only event, the evaluation may show both general and specific insights, which can be used for other future planned special events. These could include areas such as traveler information, interagency communications, and the planning process itself.

For recurring events, a file providing the cumulative benefit of lessons learned will help sharpen the traffic management plan developed for each new occurrence. It is also important to remember that with recur-

ring events, slight changes in circumstances will require modifications to the plan.

PARTICIPANT EVALUATION 

Stakeholder Debriefing

At the conclusion of the planned special event, a debriefing session should be held. The stakeholder debriefing is an opportunity to bring together those involved and impacted by the planned special event. In it, these individuals, and the groups they represent, can compare what the plan called for and what actually took place. They can also examine areas the plan may not have addressed but turned out to be issues in hindsight. All of those who were involved in creating the traffic management plan, as well as key people who played a role during the event itself, should be present for this session. This includes stakeholders forming the event planning team and traffic management team. Table 10-4 lists elements of a stakeholder debriefing.

Table 10-4
Elements of a Stakeholder Debriefing

ELEMENT
• Introductions of individuals and the roles they played (if not obvious)
• Explanation that the debriefing is not designed to find blame for anything which may have gone wrong, but to identify areas of improvement for future planned special events
• Distribution of a chronology of the special event, preferably one which melds individual agencies' own chronologies
• Review of the timeline of events
• Discussion of other areas of concern
• Next steps to incorporate lessons learned

Stakeholders include anyone who had a role or was affected by the planned special event. This certainly includes the transportation and public safety professionals who developed the plan and were involved in its execution. However, other stakeholders also have a strong interest, even if they had no part in creating the plan. For example, businesses that may have been affected by the special event, due to closed roadways limiting access, are stakeholders with a strong financial stake in the event.

The debriefing process should involve those directly involved in traffic and parking management during the event. This includes traffic management team members stationed at the command post, at the transportation management centers (TMC), and in the field. While they may not be present at the debriefing session, the viewpoints of other stakeholders should also be considered during the debriefing process. Figure 10-4 highlights Indiana State Police debriefing protocol for officers in-charge (OIC) of traffic control during the Brickyard 400 auto race.

The debriefing should not be viewed as a "finger-pointing" or "blame" session. If it is perceived that way, stakeholders will tend not to be frank about any of their own shortcomings and will more likely focus on defending themselves. To ensure involvement of all relevant stakeholders and to encourage their candid comments, it should be made clear that the debriefing session is not a time to blame anyone for something which may have gone wrong during the event.

A log or chronology of what took place during the event should be used to guide the discussion. Ideally, this log will incorporate the activities of all stakeholders so the events can be seen in the light of other actions that took place on the day-of-event. This log may be kept by a representative at the command post or at the TMC. If a master log is not kept, individual agencies can share their own chronologies before the

The identified O.I.C. (or first name on detail list) will be in charge of the detail and responsible for entire operation of detail. This person will be responsible for forwarding to the appropriate Zone Commander, not later than five (5) days following the detail, a Supplemental Incident Report covering each day of Qualifications and Race Day, containing the following information.

(1) Location by number and zone.
(2) List each unit assigned to the location by name, P.E., time spent on detail and travel time.
(3) Heavy traffic flow times at location.
(4) Comment on how location operated.
(5) Any persons arrested by personnel on your detail and charges.
(6) Any recommendations you feel will improve the operation of this location. Use diagram if needed.

Figure 10-4
Indiana State Police Debriefing Protocol for Brickyard 400[2]

meeting and these can then be merged into a single document. During the event, end-of-day review meeting notes should be examined to focus on actual situations and modifications that were incorporated into the plan.

The evaluation will compare the plan with what actually took place. Actions, whether considered good or bad, that deviated from the plan should be noted. It is not enough to simply note what was different than expected, but *why* it differed from the plan. Stakeholders should also be candid about what they would do differently based on their experience during the event.

If the planned special event is a recurring one, lessons learned should be documented so that when a traffic management plan is developed for the next event occurrence, the plan addresses past lessons learned. Even if the event represents a one-time activity, the lessons learned should still be documented. Many of the lessons may have application for the next planned special event and can be used in developing traffic management plans for similar planned special events or future events occurring at the same venue.

Patron Survey

Although the goal is to keep traffic moving on all of the transportation facilities, the patrons are the ultimate customers of everyone involved in the traffic management of the planned special event. It is largely for their benefit the traffic management plan was created in the first place, and they are the ones likely to suffer the greatest consequences if the plan does not work. Therefore, the viewpoint of event patrons is needed if a credible evaluation of the plan is to be done.

It is impossible to question everyone who attended the event, but a survey of attendees will give insight into the patrons' opinions. Unless measuring statistics for use in future event travel forecasting, it is not necessary that a scientific survey be done either. What is important is that a cross-section of patrons be surveyed in order to identify common threads. For example, if a significant number of patrons say traveler information was

inaccurate, it will become clear that aspect of the plan needs to be reexamined.

As shown in Table 10-5, the patron survey can take several forms. Appendix D contains an Internet-based event patron evaluation survey for those attending the 2003 Fair Saint Louis festival. The patron survey probably will not be able to identify problems in great detail, but combined with record keeping by the participating stakeholders, the survey should be able to focus on where problems occurred.

Table 10-5
Types of Event Patron Surveys

TYPE
• Comment cards event patrons can fill-out
• Surveyors who question attendees
• Solicited and unsolicited e-mailed comments

The survey should be brief in order to encourage a response. Yes or no type questions are easily answered. Sample questions for possible inclusion in a patron survey include:

- Were you aware of any special travel information before the event?
- Did you find information provided en-route to the event (e.g., via signs, radio) helpful?
- Did you experience any unexpected problems approaching the venue?
- Do you have any suggestions or other comments you wish to offer?

Public Survey

The public survey takes in a wider audience than the patrons. This includes those who may have been impacted by the planned special event even though they did not attend the event. Since this is a larger and more diverse group of stakeholders, it may be more difficult to identify and survey them.

Methods for reaching the public include surveys in rest areas along alternate routes and approach routes to the event, solicitations via websites, and comments provided by phone and mail. Surveys may be mailed to homeowners and businesses in the area affected by the special event to solicit their opinions. Sample questions for possible inclusion in public survey include:

- Were you aware of the event before it took place?
- If you were aware of the event beforehand, would you have altered your plans based on that information?
- Did you change your plans or schedule as a result of the event?
- How would you evaluate the effectiveness of traffic management efforts for this event (poor, good, excellent)?
- Do you have any additional comments or suggestions based on your experience?

An effort must be made to collate all comments from widespread locations to be certain all input is considered. Specific outreach may be made to members of the public who were directly impacted by the event. Businesses, residents, and transit riders are a few of those who may have experienced impacts caused by the planned special event. Since these individuals can be found at easily identifiable locations, or perhaps actively participated in the review and comment of the traffic management plan during the event operations phase, it is easier to survey these stakeholders.

POST-EVENT DEBRIEFING

A post-event debriefing should be held to review what took place. The purpose of the debriefing is to: (1) examine what took place, (2) compare it to what was expected to happen, (3) identify what worked well, and (4) determine areas of improvement for future planned special events.

Meeting Organization

Ideally, the post-event debriefing should be planned during the event operations planning phase and before the event takes place. If that does not happen, the debriefing should still be held, but it may be more difficult to get full participation by all involved stakeholders.

The meeting should be scheduled at least a few days after the event, giving traffic management team members some time to absorb what took place during the event and an opportunity to put it into perspective. However, the meeting should not be delayed too long after the event so memories of what took place remain fresh.

The place and timing of the meeting should be such that maximum attendance is realized. Considerations should include: (1) the rotating schedules of those who may attend, (2) ease of access to the meeting location, and (3) potential conflicts with other events.

If there were significant interagency conflicts during the planning of the event, or during the event itself, a neutral location and moderator may improve dialogue during the meeting.

If these types of conflicts were not a problem, consideration should be given to having one of the traffic management team supervisors or incident commander lead the meeting. Whatever the case, the moderator should be skilled in involving all the participants and in digging into responses to get to the root of any stated problems.

If the traffic management plan included a transportation management center, there may also be some advantages to holding the meeting at the TMC. Figure 10-5 shows a meeting room located inside a TMC. As indicted in the figure, there may be additional resources in the TMC which can be used, and having it available visually can help participants better understand what took place during the planned special event.

Figure 10-5
TMC Meeting Room

Meeting Agenda

It is important to remember that the post-event debriefing is not designed to be a time to blame individuals or agencies for what took place during the event. This should be reflected in the agenda developed for the meeting. It should clearly state the intended purpose of the meeting. This will help keep meeting attendees focused and provide added assurance that the meeting is designed to identify successes and lessons learned.

Stakeholders can agree on a general outline for the debriefing even before the event. This helps assure the debriefing covers top-

ics of interest to all participants and not designed to be biased against any stakeholder. Further details of the agenda can be filled in after the event and when problems requiring closer examination can be identified. Again, it would be beneficial if all participants had input into revising the agenda to make certain all concerns are addressed.

Table 10-6 lists the broad topic areas that should be covered in the post-event debriefing.

Table 10-6
Post-Event Debriefing Meeting
Agenda Topics

TOPIC AREA
• Purpose of meeting
• The planning process
• Interagency communications
• Traffic management in and around the venue
• Traffic management outside of the event site
• Traveler information, including media
• Lessons learned

Identification of Key Successes and Lessons Learned

The purpose of the post-event debriefing is not to just identify what could have been done better but to note what was successful. As has been the case from the start of the event operations planning process through the event itself, multiple viewpoints are helpful as stakeholders identify key successes and lessons learned. Depending upon perspective, one element of the plan may be viewed as a success by one party and seen as an area needing improvement by another.

Identifying these areas can be accomplished as each stakeholder individually reviews its actions leading up to and going through the event and as the stakeholders, as a group, review what took place.

It is helpful if participants are asked to identify, before the post-event debriefing, what they see as key successes and lessons learned. It may also prove beneficial if these notes are shared among the participants before the meeting to help facilitate discussion.

While identifying these points are very useful, it has little value unless there is some way to identify how to apply what is learned to the next planned special event. No one individual should be expected to serve as either the group's or their agency's corporate memory. The successes and lessons learned must be chronicled so that those stakeholders who are responsible for planning the next planned special event will be able to tap the wisdom of those who have done this before.

As an example, the following represents an excerpt, regarding traffic management and operations during Daytona Beach, FL Race Week (e.g., Daytona 500) and Bike Week, from the minutes of a regular, bi-monthly Volusia County (FL) Freeway Incident Management Team meeting:[3]

- *Race Week was February 14th to February 17th. Traffic was very heavy each day of the races. Friday the 15th had problems in Ormond Beach. There was an unexpected large outbound towards Ormond Beach. Saturday, Florida Highway Patrol, Ormond Beach PD, Daytona Beach PD, Volusia County Traffic Engineering, FDOT and Daytona Beach Traffic Engineering met to discuss traffic patterns and staffing for Ormond Beach so Friday's problems would not happen during the outbound of the Daytona 500 Race. Sunday's traffic was extremely heavy for the inbound. The free parking lot entrance on Williamson will need to be larger for next year. The*

traffic trying to enter this parking lot could not enter fast enough so, this area became grid locked. This area was grid locked from northbound Williamson to Beville, eastbound and westbound on Beville at Williamson further than the view of the traffic cameras. Capt. Duncan enforced a rolling roadblock on I-4 to stop traffic from entering this area. This gave traffic time to get into the parking lot. Video was collected of the new Pedestrian Overpass. This overpass was successfully used by thousands of race fans.

- *Bike Week was March 1st to March 10th. Port Orange reported problems at Nova Road and Dunlawton. Mr. Lester stated they went out to this location to see if anything could be done with the traffic signal to alleviate the traffic congestion. Unfortunately, the signal was at its maximum timing and nothing could be changed.*

POST-EVENT REPORT

Table 10-7 presents an outline of a typical post-event report.

Report Organization

A report that reviews the planned special event is necessary to document what was learned. By clearly outlining the material in the report, it becomes easier to identify the key successes and lessons learned. It also makes it easier to go back to the report and look at particular aspects of the traffic management plan implemented when planning the next planned special event.

Since the process of handling the planned special event follows a timeline, the easiest way to organize the report may involve reviewing what took place chronologically. An alternative method of organizing the report concerns dividing it by subject areas such as traffic management, traveler information, command center operation, and communications. Since some areas overlap, there should be references in the report to other sections, which may have application in multiple areas.

Table 10-7
Outline of Post-Event Report

REPORT ORGANIZATION
• Outline report topics. • Document products of the event operations planning phase. • Identify key successes. • Present lessons learned. • Identify improvements for future events. • Configure to serve as a working document for future special event planning. • Review chronologically what took place. • Summarize both positive and negative aspects. • Include all stakeholder viewpoints.
OPERATIONAL COST ANALYSIS

• Examine operational costs.
• Include staffing, overtime, and equipment for each involved agency.
• Identify potential cost savings.
  o Reallocation of personnel
  o Division of responsibilities
  o Use of technology
• Include total staffing, overtime, and equipment for all agencies.

QUALITATIVE EVALUATION
• Include survey of stakeholders. • Include survey of event patrons. • Include survey of public.
QUANTITATIVE EVALUATION

• Provide numerical picture of the event.
  o Costs
  o Hours saved
  o Traffic incidents handled
  o Passengers carried on various modes.
• Present cost/benefit analysis.

The report should summarize both positive and negative aspects. Remember, this is not designed to be a public relations piece to promote the handling of the planned special event but a working document to assist future special event planning. If differing per-

spectives are noted during the debriefing process and there is not consensus on how to address a particular situation, all stakeholder viewpoints should be documented.

Table 10-8 lists the elements that should be included in a post-event report. As with the post-event debriefing, the post-event report should not blame individuals or organizations for anything that did not go well. The report should provide a factual recounting of the special event, including planning the event itself and what took place during the post-event debriefing. If opinions are noted in the report, then the opinions should be segregated from the factual information and noted as opinions.

Table 10-8
Elements of a Post-Event Report

ELEMENT
• A copy of the original traffic management plan
• A combined chronology of the event, incorporating actions by all participants
• List of recommended improvements
• Statistical information (e.g., number of traffic incidents, number of CMS and HAR messages).
• Survey results
• General comments by participants

Operational Cost Analysis

Part of the evaluation process is to look at the operational costs of managing the planned special event. Expenses such as staffing, equipment and overtime should be noted by the agency incurring the expense.

This information should be broken down into categories that allow others to understand the costs and the specific efforts associated with the expenditures.

In the same way, operational decisions can be reviewed to identify areas that can be improved. Operational costs can also be reviewed with areas of potential cost saving identified. In some cases, these expenses may be in areas where the reallocation of personnel would result in reduced expenses or improved operations. In other areas, the use of technology may result in savings.

While individual stakeholders are responsible for gathering information on their own costs, there is also benefit in merging the figures of all agencies to have a better picture of total expenses for personnel and equipment. This may also provide opportunities to see how dividing responsibilities in different ways could result in cost savings. Among the costs that should be analyzed are overtime expenses, costs of deploying equipment, equipment rental costs, additional communications expenses, and expenses for public information efforts.

Qualitative Evaluation

The qualitative evaluation, while based on softer measures such as opinion and perspective, still provides a very valuable measure of the success in handling the planned special event. This is especially true when measuring patron and public views on the event. Quantitative measures may be easier to manage, but qualitative judgments may help determine the success of the plan. Even if the numbers show the plan was a success, if the qualitative evaluation shows significant dissatisfaction, it will be difficult to view the event in a positive light.

The qualitative evaluation is based on a number of factors, including the survey of the public and event patrons. Also important is the qualitative evaluation provided by those stakeholders who managed the event. If they view the exercise as a failure, it will be difficult to get them to fully commit to subsequent efforts for future planned special

events. Table 10-9 summarizes key topics of a qualitative evaluation.

Table 10-9
Key Topics of a Qualitative Evaluation

TOPIC
• Quality of pre-event information • Quality of day-of-event information • Direction provided to the event and at the venue • Traffic management at the site • Egress from the venue

Quantitative Evaluation

The quantitative evaluation provides a numerical picture of the event. Figures such as costs, hours saved, incidents handled, and passengers carried provide a view which can be compared with similar events and provide a metric to judge how well the traffic management plan worked. As the saying goes, what gets measured gets done. If that is the case, then involved stakeholders should identify, before the event, what they wish to measure. While computer programs allow any number of items to be tabulated and measured, a good understanding before the event will facilitate the measurement of the key areas identified.

The quantitative evaluation is very useful when conducting a cost/benefit analysis of activities for the planned special event. Knowing where the most benefit was realized for the costs incurred can help in the planning process to see if resources should be reallocated for the next event.

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1. *The Dutchess County Fair Traffic Plan*, New York State Department of Transportation, Presentation at the 2002 ITS New York Meeting, Saratoga Springs, Ny., June 5--7, 2002, 24 pp.

2. *Indiana State Police 2002 Brickyard Race Detail*, Indiana State Police, 2002.

3. "Minutes of the Volusia County Freeway Incident Management Team," Volusia County Freeway Incident Management Team, March 13, 2002.

CHAPTER ELEVEN
DISCRETE/RECURRING EVENT AT A PERMANENT VENUE

Figure 11-1
Discrete/Recurring Event at a Permanent Venue: Qualcomm Stadium in San Diego, CA

PURPOSE

In order to assist the user in planning for a particular planned special event, this chapter describes an advance planning and travel management process and considerations specific to a *discrete/recurring event at a permanent venue*. It summarizes recommended policies, guidelines, procedures, and resource applications that were previously discussed in the first ten chapters of this technical reference. This chapter presents these guidelines and procedures in tables, flowcharts, and checklists that can be followed to help guide the user through all the stages of a planned special event of this category for a particular locale. Although Chapter 3 presents all the steps necessary to manage travel for a planned special event, this chapter provides a roadmap to help guide the user through all five phases of managing travel for planned special events, identifying issues, analysis, and products applicable to discrete/recurring events at a permanent venue. To further guide readers, this chapter specifies references to data, special considerations, and best practices for this event category.

INTRODUCTION 

In order to guide the user, this chapter addresses four key topics, corresponding to five phases of managing travel for planned special events, including: (1) *event operations planning*, (2) *implementation and day-of-event activities*, (3) *post-event activities*, and (4) *program planning*. In planning for all planned special events in a region, the final section on program planning highlights issues to consider that evolve from and/or pertain to discrete/recurring events at a permanent venue. By following each one of the steps and procedures, the user will have identified and covered all the significant aspects that are necessary to result in successful management of travel for a planned special event with characteristics specific to a discrete/recurring event at a permanent venue.

A discrete/recurring event at a permanent venue occurs on a regular basis at a site zoned and designed specifically to accommodate planned special events. Table 11-1 indicates different types of planned special events classified as a discrete/recurring event at a permanent venue. This category includes events that occur in urban and metropolitan areas, and the rural event category includes discrete/recurring events at a permanent venue that take place in rural areas. Table 11-2 lists key characteristics of a discrete/recurring event at a permanent venue.

Table 11-1
Types of Discrete/Recurring Events at a Permanent Venue

EVENT TYPE
• Sporting and concert events at stadiums and arenas
• Concert events at amphitheaters

Table 11-2
Distinguishing Operating Characteristics of a Discrete/Recurring Event at a Permanent Venue

CHARACTERISTIC
• Specific starting and predictable ending times
• Known venue capacity
• Advance ticket sales
• Weekday event occurrences

Special Considerations

In light of the characteristics of a discrete/recurring event at a permanent venue, special considerations when planning such an event include:

- Permanent venues located in urban areas usually have exclusive off-street parking to accommodate capacity events, and good access exists between venue parking areas and freeway/arterial corridor traffic flow routes serving the venue.
- In metropolitan areas, permanent venues often feature high-capacity connections (e.g., transit) to the transportation system serving the region.
- Parking areas at many permanent venues exist immediately adjacent to the venue, creating a more self-contained site traffic circulation and pedestrian access environment similar to other major, permanent traffic generators (e.g., airports and regional shopping centers).
- These events generate high peak arrival rates because of event patrons': (1) urgency to arrive at the venue by a specific start time and (2) possession of a reserved seat ticket that does not require early arrival.
- Special events that have general admission seating or permit tailgating have lower, yet pronounced, peak arrival rates.
- Discrete/recurring events at a permanent venue end abruptly, thus creating high

peak pedestrian and traffic departure rates.

- The travel demand rate profile, over time, represents a distinguishing characteristic that warrants special consideration during advanced planning and day-of-event travel management.
- Event characteristics, such as known venue capacity and advance ticket sales, afford practitioners the opportunity to perform travel demand forecasts with greater precision and accuracy.
- Discrete/recurring events at a permanent venue allow the collection of transferable historical data that improves predictability in feasibility study traffic and parking analyses for future events held at a particular venue.
- Experience gained from each planned special event can be used to further improve the identification and mitigation of roadway capacity deficiencies.
- Weekday events place a high priority on prediction and stakeholder preparation because of potential impacts on commuter traffic and transit operations.

EVENT OPERATIONS PLANNING 

The level of stakeholder effort required under the event operations planning phase for a discrete/recurring event at a permanent venue depends on whether a venue traffic management plan already exists. The event planning team focuses either on developing a new plan or modifying an existing traffic management plan designed and implemented for past events at the subject venue. In the latter case, the event planning team should conduct a review of past, pertinent feasibility studies for each proposed event. This will help to identify special transportation characteristics of each event and identify similarities to previously held events. Attendance, time of occurrence, previous lessons learned, and other special circumstances should be considered during this review.

Figure 11-2 presents 31 steps in the event operations planning process for all planned special events. The flowchart covers development and integration of the phase's three primary products: feasibility study, traffic management plan, and travel demand management initiatives. Table 11-3 complements the flowchart by providing step-by-step guidance on issues and recommended analyses for a discrete/recurring event at a permanent venue. The table also presents reference information contained in this handbook that is specific to discrete/recurring events at a permanent venue. While all of the major handbook topics under event operations planning apply to a discrete/recurring event at a permanent venue, Table 11-3 indicates data, planning considerations, and agency example applications (e.g., via narratives or photos) within the context of this event category. In turn, practitioners can use example applications presented for a discrete/recurring event at a permanent venue to manage travel for other categories of planned special events.

It is important for the user to note that the planning process described herein applies to a single special event occurrence only. Feasibility study results and traffic management plan specifications vary for: (1) recurring events of the same type (e.g., all home games for a specific sports team) and (2) capacity events of different types held at the same venue (e.g., a sold-out sporting event versus sold-out concert at the same stadium). In the former case, practitioners should conduct an iterative event operations planning process in order to develop traffic

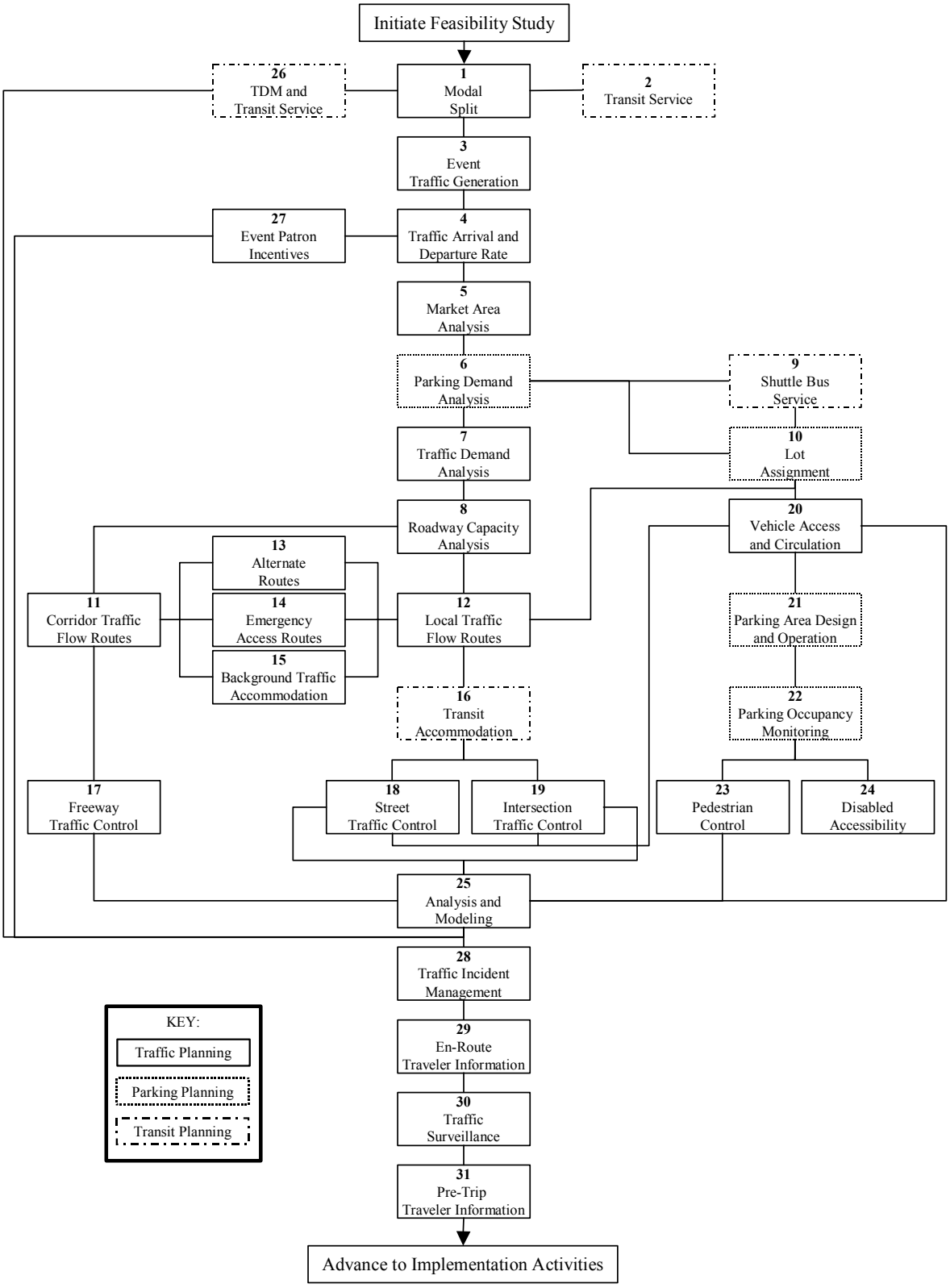

Figure 11-2
Event Operations Planning Process Flowchart

Table 11-3
Event Operations Planning Steps
Discrete/Recurring Event at a Permanent Venue

STEP NO.	STEP PAGE	EVENT-SPECIFIC ISSUES	EVENT-SPECIFIC REFERENCE INFORMATION TOPIC	PAGE
1	5-20	• Potential high level of express/charter bus service for sporting events. • Review of historical transit data.	• *Data:* Percentage of walking trips for on-campus college football games.	5-21
			• *Data:* Example modal split for various permanent venues; Table 5-12.	5-21
2	7-9	• Impact of weekday events on non-attendee transit users.	• *Example:* Express bus services.	7-11
			• *Example:* Charter bus service.	7-13
3	5-21	• Variation in vehicle occupancy by event type, event day/time, and venue location.	• *Data:* Vehicle occupancy factor; Table 5-14.	5-23
4	5-22	• Change in peak arrival rate by event type and day/time.	• *Data:* Traffic arrival rate characteristics; Table 5-15.	5-24
			• *Special consideration:* Traffic operations during event patron departure.	5-23
5	5-25	• Use of origin location analysis. • Larger market area for major concert and sporting events. • Attraction of non-home based trips for weekday events.	• *Data:* Estimate of non-home based trips for a downtown venue.	5-26
			• *Special consideration:* Recommended market area analysis methodology and considerations.	5-26
			• *Example:* Appendix E – Regional directional distribution.	5-25
6	5-27	• Very low turnover during event.		
7	5-29			
8	5-30	• Analysis of peak arrival and departure periods.		
9	6-32	• Design of service to expand and contract (e.g., number of buses operating) based on event patron arrival/departure rates throughout the day-of-event.	• *Special consideration:* Shuttle bus service design.	6-33
			• *Special consideration:* Shuttle bus service cost.	6-36
10	6-13	• Significant media parking requirement for major sporting events.		
11	6-38		• *Example:* Plan showing target points; Figure 6-30.	6-39
			• *Example:* Appendix I – Traffic flow maps.	6-47
12	6-38		• *Example:* Plan showing multiple local traffic flow routes; Figure 6-31.	6-39
			• *Example:* Appendix I – Traffic flow maps.	6-47
13	6-40			
14	6-41			
15	6-43	• Key consideration for downtown venues and venues adjacent to residential and business areas.		
16	6-45			
17	6-49		• *Example:* Temporary elimination of freeway weaving area; Figure 6-39.	6-53
			• *Example:* Prohibition of late freeway diverge; Figure 6-40.	6-53
			• *Example:* Remote traffic surveillance and management; Figure 6-41.	6-53
			• *Example:* Appendix K – Traffic control plans and maps.	6-59
18	6-51		• *Example:* Contraflow operation during event traffic egress; Figure 6-44.	6-54
			• *Example:* Appendix K – Traffic control plans and maps.	6-59
19	6-57		• *Example:* Elimination of competing intersection traffic flow; Figure 6-50.	6-57
			• *Example:* Achieving intersection turning movement lane balance; Figure 6-51.	6-57
			• *Example:* Roadblock of ingress route to facilitate egress; Figure 6-52.	6-58
			• *Example:* Intersection advance signing; Figure 6-53.	6-58

STEP		EVENT-SPECIFIC ISSUES	EVENT-SPECIFIC REFERENCE INFORMATION	
NO.	PAGE		TOPIC	PAGE
			• *Example:* Appendix J – Operation of centralized traffic signal system.	6-59
			• *Example:* Appendix K – Traffic control plans and maps.	6-59
20	6-16	• Vehicle cruising after event to pick-up event patrons.	• *Example:* En-route information dissemination on site access and parking; Figure 6-6.	6-14
			• *Example:* Temporary parking area identification landmark; Figure 6-8.	6-15
			• *Example:* Implementation of lane channelization on a parking area access road; Figure 6-10.	6-18
			• *Example:* Strategy for eliminating taxi/limo cruising at the end of an event.	6-19
			• *Example:* Appendix H – Site and parking maps; Figures 6-16 and 6-17.	6-25, 6-27
21	6-20	• Key consideration for event ingress operations.	• *Special consideration:* Permanent venue gate and queue storage lanes; Figure 6-13.	6-21
22	6-23			
23	6-28	• Pedestrian overcrowding near venue.	• *Special consideration:* Pedestrian arrival and departure rates.	6-27
			• *Example:* Pedestrian traffic monitoring via closed-circuit television; Figure 6-21.	6-29
24	6-32			
25	6-9	• Analysis of peak ingress and egress travel periods.		
26	7-2 to 7-14	• High applicability of HOV incentives and express/charter bus service to this event category.	• *Example:* High occupancy vehicle incentives; Figure 7-3.	7-3, 7-5
			• *Example:* Transit service marketing.	7-13
27	7-6	• Particularly applicable to managing event arrival and departure rate.	• *Special consideration:* Recommended event patron incentives.	7-6
			• *Example:* Survey on event patron incentives; Figure 7-4.	7-7
28	6-72		• *Example:* Public information safety campaign.	6-73
			• *Example:* Highway advisory radio traveler safety message; Figure 6-61.	6-74
29	6-61		• *Example:* Permanent changeable message sign over stadium access road; Figure 6-56.	6-64
30	6-70			
31	7-14	• Dissemination of traveler information through event and venue websites. • Dissemination of transportation guide with advance ticket mailings.	• *Example:* Appendix L – Public agency and event-specific websites.	7-17
			• *Example:* Telephone information systems; Figure 7-9.	7-19
			• *Example:* Public information campaign.	7-19
			• *Example:* Appendix M - Venue transportation guides.	7-21
			• *Example:* Television travel report; Figure 7-12.	7-22

management plans for a range of future event scenarios, varying by characteristics such as attendance and time of occurrence. Example scenarios include expected high-attendance events because of special promotions or circumstances and weeknight football games versus traditional weekend games. In the latter case, different event types have dissimilar event operation characteristics such as market area, audience accommodation, and time of occurrence. Available transportation services and stakeholder resources may vary from one capacity event to another. For instance, an exclu-

sive express bus service between area park-and-ride lots and a stadium may operate for Sunday football games but not for a concert at the same facility because of resource constraints.

The flowchart in Figure 11-2 represents a suggested order of event operations planning activities. However, as noted below, the event planning team can modify activities to create a dynamic and more effective planning process tailored to the scope of a specific planned special event:

- Based on lessons learned from past special events at a particular permanent venue, stakeholders may program new infrastructure or adopt new policies (e.g., parking restrictions) early in the event operations planning process.
- Links between process steps are two-way as stakeholders evaluate alternative strategies and/or integrate traffic management plan components.
- The event planning team can develop different traffic management plan components concurrently.

The event operations planning process references information and concepts contained in the advance planning section of this handbook, and it directs the user to recommended guidelines, procedures, strategies, and resource applications for managing travel for a specific planned special event. When following the process, practitioners should review:

- Important advance planning considerations and external factors, summarized in Chapter 5, that influence planning activities. For instance, under risk assessment, scenarios relating to fan celebrations and excessive overcrowding may warrant consideration if planning for a major sporting or concert event.
- Traffic management plan components in Chapter 6 that provide an overview of various principles driving plan development in addition to a contingency plan checklist.

IMPLEMENTATION AND DAY-OF-EVENT ACTIVITIES

The traffic management team that manages travel for a discrete/recurring event at a permanent venue usually has familiarity with traffic patterns and potential flow breakdown points in the vicinity of the site, primarily based on their past experience on previously held special events at the same venue. Hence, stakeholder development of implementation plan details focus on transportation operation successes and lessons learned for previous, similar events at the subject venue. Special events regularly occur at stadium, arena, and amphitheater venues. Involved traffic operations and law enforcement personnel, for instance, maintain a level of preparedness akin to that of traffic incident responders.

Table 11-4 presents a checklist of implementation and day-of-event activities for stakeholders to consider regarding any discrete/recurring event at a permanent venue. As indicated in the table, the event planning team must determine, based on various event operations characteristics (e.g., event type, event location, event time of occurrence, attendance, market area, etc.) and other external factors, what unique set of activities apply in handling a specific special event. The table facilitates fast access to handbook sections providing detailed guidance, including recommended strategies, protocol, and resource applications, required by users to plan and execute these activities.

Table 11-4
Checklist of Implementation and Day-of-Event Activities for Discrete/Recurring Events at a Permanent Venue

HANDBOOK PAGE	ACTION	APPLIES ☑
8-2	• Develop an implementation plan.	☐
8-6	• Conduct a stakeholder simulation exercise(s).	☐
8-8	• Test equipment resources slated for use on the day-of-event.	☐
8-9	• Recruit and train volunteers to fulfill personnel resource needs.	☐
9-2	• Implement a traffic management team management process.	☐
9-4	• Designate a multi-agency command post.	☐
9-6	• Conduct traffic management plan evaluation(s) during the day-of-event.	☐
9-6	• Establish protocol for traffic management team officials to consider and implement changes to the traffic management plan to accommodate real-time traffic conditions.	☐
9-8	• Establish interagency communication protocol.	☐
9-9	• Review communication equipment compatibility.	☐
9-10	• Use the media to communicate with event patrons and other transportation users.	☐
9-12	• Perform traffic monitoring on the day-of-event.	☐

Some distinguishing considerations of this event category during the day-of-event activities phase include:

- Because of the numerous planned special events held annually at a permanent venue, stakeholders typically have a set location for an on-site command post. For larger venues in metropolitan areas, the command post may reside inside the venue, contain permanently installed equipment (e.g., computer and communication connections, video monitors, etc.), and function as a satellite transportation management center.
- Interagency communication structure and protocol is generally well established and understood by all participating personnel.
- Traffic advisory services often monitor special events at permanent venues and disseminate traveler information accordingly, and the media provides significant coverage of major sporting events that usually includes traveler information and transportation system operations monitoring. The traffic management team may interact with these information providers on the day-of-event.
- The collection and evaluation of transportation system performance data proves valuable in guiding decision-making for future discrete/recurring events at a permanent venue. Stakeholders can archive raw data for use in future feasibility studies, and various evaluation measures can identify specific areas that require improvement for future, similar events at the subject venue. The traffic management team must exercise great care in collecting performance evaluation data in order to ensure data quality and consistency.

POST-EVENT ACTIVITIES

Since a discrete/recurring event at a permanent venue has the benefit of numerous events having been held at the site, it is usually not necessary to conduct all post-event activities normally required for other event categories. Table 11-5 presents a checklist of post-event activities applicable to any discrete/recurring event at a permanent venue. Certain special events of this category (e.g., new event type at venue, statewide/national market area, etc.) that present a challenging and potentially recurring travel management scenario for stakeholders warrant most, if not all, activities listed in the table. The post-event activities section of this handbook provides detailed information on common techniques, special considerations, and recommended protocol that facilitate the activities listed in Table 11-5.

Some distinguishing considerations of this event category during the post-event activities phase include:

- Post-event debriefings represent a common and recommended stakeholder activity regarding discrete/recurring events at a permanent venue.
  - On a regional level, such meetings may coincide with a regular traffic incident management team meeting.
  - With major discrete/recurring events (e.g., capacity or near-capacity) often regularly occurring at permanent venues, the event planning team and traffic management team may use a post-event debriefing as a basis to update a traffic management plan and travel demand management initiatives for future planned special events at the venue.

Table 11-5
Checklist of Post-Event Activities for Discrete/Recurring Events at a Permanent Venue

HANDBOOK PAGE	ACTION	APPLIES ☑
10-2	• Review measures of effectiveness identified in event operations planning phase.	☐
10-3	• Compile agency measures of effectiveness.	☐
9-14	• Compile performance evaluation data.	☐
10-5	• Conduct stakeholder participant debriefing.	☐
10-6	• Conduct event patron survey.	☐
10-7	• Conduct public survey.	☐
10-7	• Conduct a post-event debriefing meeting.	☐
10-10	• Prepare a post-event report.	☐

- Public surveys warrant strong consideration for special events under this category as event performance evaluation data fails to assess all community impacts.
  - Though not necessary for every event occurrence, stakeholders may conduct a public survey: (1) after the first of a series of recurring special events (e.g., sports season), (2) after receiving negative feedback through community interest stakeholders, or (3) after a specified period of time (e.g., annually or every few years) for all events held at a particular permanent venue.
  - Survey results alert special event stakeholders of impacts to affected residents and businesses, in addition to non-attendee transportation system users, that may continue to occur with each successive major special event at a particular permanent venue. As a result, stakeholders can develop and implement appropriate strategies (e.g., enforcement, etc.) to mitigate the identified impact(s) for future planned special events. Traffic management team efforts also would include monitoring known community impacts on the future day-of-event followed by a post-event evaluation.

PROGRAM PLANNING

Program planning activities involve the development of policies, programs, and initiatives that facilitate improved planning and management of travel for future planned special events. Program planning activities for all planned special events in a region have a high level of applicability to discrete/recurring events at a permanent venue. Stakeholders that have a consistent role in managing travel for planned special events at a particular permanent venue can address recurring needs and improve the planning process for future events through various regional planned special event program initiatives.

Table 11-6 summarizes program planning activities for discrete/recurring events at a permanent venue.

Some distinguishing considerations of this event category during the program planning phase include:

- The fixed location of major planned special event venues allows for the easy identification of stakeholder representatives involved in regular planning and day-of-event travel management for special events at these venues. Under a regional planned special events program framework, these representatives collaborate as a task force, working to: (1) strengthen interagency coordination for future special events, (2) identify needs relative to minimizing community impacts and improving transportation system operations during venue events. The latter involves proposing new policies, regulations, and infrastructure deployments to support future event-specific traffic management plans and travel demand management initiatives.
- Permanent infrastructure deployments prove cost-effective at permanent venues hosting numerous planned special events or multiple major events in a calendar year. As indicated in Table 11-6, infrastructure deployment also includes new transportation services designed to increase transportation system capacity during a planned special event. For instance, a transit agency may design and

market an express bus service for an entire sports season.

- The occurrence of major discrete/recurring events at a permanent venue (e.g., roving sports championship events, auto races, other capacity events, etc.) often serve as a platform for stakeholders to assess new services and infrastructure proposed for a single, major special event in the context of supporting: (1) all special planned special events in a region and (2) day-to-day transportation system operations. The foreknowledge of planned special events allow stakeholders to work with transportation agency administrators in order to incorporate pertinent planned special events initiatives in agency budgets and/or transportation improvement programs.

Table 11-6
Program Planning Activities for Discrete/Recurring Events at a Permanent Venue

PRODUCT	TOPIC	PAGE NO.
Institutional frameworks	• Creation of a regional transportation committee on planned special events (e.g., oversight team).	2-15 4-2 5-3
	• Creation of a transportation operations task force for a specific permanent venue.	5-3
	• Development of a joint operations policy.	5-15
Policies and regulations	• Traffic and parking restrictions.	5-10
	• Public-private towing agreements.	5-16
	• Public information safety campaign.	6-73
	• High occupancy vehicle incentives.	7-3
Infrastructure deployment	• Advanced parking management system.	6-15
	• Electronic fee collection system.	6-22
	• Planned alternate route for diverting background traffic around a venue.	6-40
	• Portable traffic management system.	6-56
	• Express, charter, or shuttle bus service.	6-32 7-11 7-12
	• Telephone information systems.	7-17
	• Kiosks.	7-21

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CHAPTER TWELVE
CONTINUOUS EVENT

Figure 12-1
Continuous Event: Summerfest Music Festival in Milwaukee, WI
(Photo courtesy of the Wisconsin DOT.)

PURPOSE

In order to assist the user in planning for a particular planned special event, this chapter describes an advance planning and travel management process and considerations specific to a *continuous event*. It summarizes recommended policies, guidelines, procedures, and resource applications that were previously discussed in the first ten chapters of this technical reference. This chapter presents these guidelines and procedures in tables, flowcharts, and checklists that can be followed to help guide the user through all the stages of a planned special event of this category for a particular locale. Although Chapter 3 presents all the steps necessary to manage travel for a planned special event, this chapter provides a roadmap to help guide the user through all five phases of managing travel for planned special events, identifying issues, analysis, and products applicable to continuous events. To further guide readers, this chapter specifies references to data, special considerations, and best practices relating to this event category.

INTRODUCTION

In order to guide the user, this chapter addresses four key topics, corresponding to five phases of managing travel for planned special events, including: (1) *event opera-*

tions planning, (2) *implementation and day-of-event activities*, (3) *post-event activities*, and (4) *program planning*. The final section on program planning highlights issues to consider, that evolve from and/or pertain to continuous events, in planning for all planned special events within a region or jurisdiction. By following each one of the steps and procedures, the user will have identified and covered all the significant aspects that are necessary to result in successful management of travel for a planned special event with characteristics specific to a continuous event.

Table 12-1 indicates different types of planned special events classified as a continuous event. This category includes events that occur in urban and metropolitan areas, and the rural event category includes continuous events that take place in rural areas. Aside from conventions and state/county fairs, many continuous events take place at a temporary venue, a park, or other large open space. These venues host planned special events on a less frequent basis than permanent multi-use venues, and planned special event permitting typically governs whether a temporary venue can adequately handle the transportation impact of a particular continuous event. Table 12-2 lists key characteristics of a continuous event.

Table 12-1
Types of Continuous Events

EVENT TYPE
• Fairs
• Festivals
• Conventions and expos
• Air and automobile shows

Table 12-2
Distinguishing Operating Characteristics of a Continuous Event

CHARACTERISTIC
• Occurrence often over multiple days
• Arrival and departure of event patrons throughout the event day
• Typically little or no advance ticket sales
• Capacity of venue not always known
• Occurrence sometimes at temporary venues

Special Considerations

In light of the characteristics of a continuous event, special considerations when planning such an event include:

- Daily attendance, a key input in the travel forecast analysis process, is often difficult to estimate, and day-of-event weather conditions may significantly affect it.
- The traffic generation characteristics and market area of different continuous events may vary considerably, thus limiting the transfer of historical data between non-identical special events.
- Most events do not have an attendance capacity or defined "sell-out."
- Venues may have limited access to transit stations and adjacent high-capacity arterial roadways and freeways.
- High attendance events in downtown areas require extensive planning for parking and travel demand management.
- Major continuous events typically generate trips from a multi-county region.
- Potential weather impacts require the consideration of a wide range of contingency plans relative to site access, parking, pedestrian access, traffic control, and traffic incident management.
- Continuous events held at temporary venues may significantly impact nearby neighborhood residents and businesses.

EVENT OPERATIONS PLANNING 

Because of the contrasting characteristics of different continuous events and the respective venues hosting these events, the event planning team should develop (1) a feasibility study, (2) a traffic management plan, and (3) travel demand management initiatives (as necessary) in the event operations planning phase. The stakeholder composition of an event planning team varies by event, as some continuous events represent community or not-for-profit events while others involve commercial dealings. Recurring continuous events, such as an annual fair or air show, permit stakeholders to reference a past feasibility study and traffic management plan, coupled with operations successes and lessons learned, when conducting advance planning activities for a future event. However, due to the significant time between recurring continuous events, the event planning team must anticipate (1) changes in the operations characteristics of a future event, (2) modifications to the transportation system serving the event, and (3) changes in the community (e.g., land use, socioeconomic, regulations, etc.).

Figure 12-2 presents 31 steps in the event operations planning process for all planned special events. The flowchart covers development and integration of the phase's aforementioned three products. Table 12-3 complements the flowchart by providing step-by-step guidance on issues and recommended analyses for a continuous event. The table also presents reference information contained in this handbook that is specific to continuous events. While all of the major handbook topics under event operations planning apply to a continuous event, Table 12-3 indicates data, planning considerations, and agency example applications (e.g., via narratives or photos) within the context of this event category. In turn, practitioners can use example applications presented for a continuous event to manage travel for other categories of planned special events.

The flowchart in Figure 12-2 represents a suggested order of event operations planning activities. However, as noted below, the event planning team can modify activities to create a dynamic and more effective planning process tailored to the scope of a specific planned special event:

- A jurisdiction planned special event permit process and requirements will scope, schedule, and direct event operations planning activities for continuous events.
- Links between process steps are two-way as stakeholders evaluate alternative strategies and/or integrate traffic management plan components.
- The event planning team can develop different traffic management plan components concurrently.

The event operations planning process references information and concepts contained in the advance planning section of this handbook, and it directs the user to recommended guidelines, procedures, strategies, and resource applications for managing travel for a specific planned special event. When following the process, practitioners should review:

- Advance planning and travel management process and considerations provided in Chapter 11, as appropriate, for continuous events that occur at a permanent venue (e.g., stadium, arena, amphitheater, and convention center).

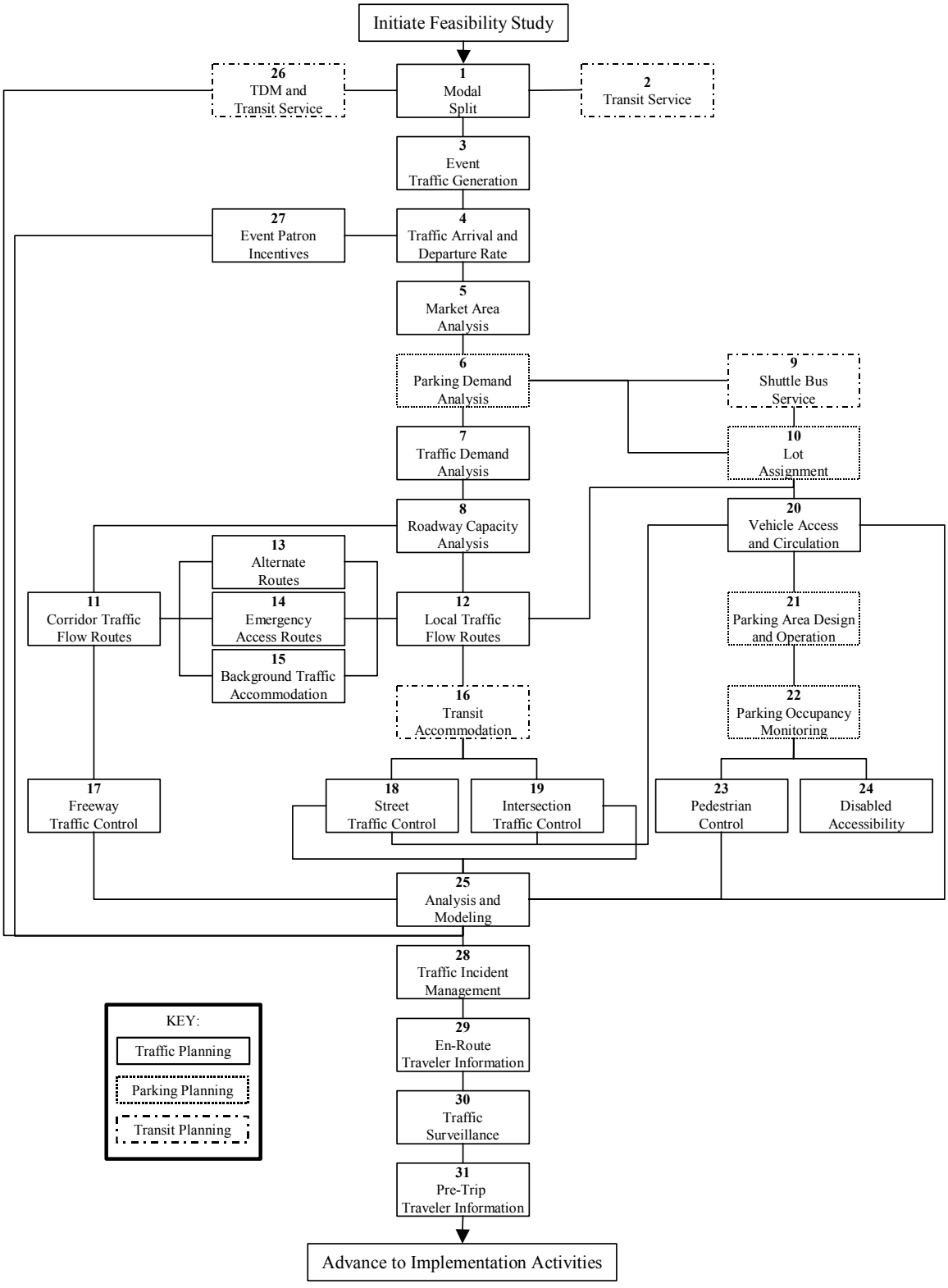

Figure 12-2
Event Operations Planning Process Flowchart

Table 12-3
Event Operations Planning Steps
Continuous Event

STEP		EVENT-SPECIFIC ISSUES	EVENT-SPECIFIC REFERENCE INFORMATION	
NO.	PAGE		TOPIC	PAGE
1	5-20		• *Example:* Appendix D – Internet-based event patron evaluation survey.	5-21
2	7-9	• Potential financial incentive for transit service to provide express/charter service.		
3	5-21	• Variation in daily attendance on each day of a multi-day event. • Impact of weather on attendance (if open-air venue).	• *Data:* Daily attendance split for multi-day continuous events. • *Data:* Vehicle occupancy factor; Table 5-14. • *Special consideration:* Estimating daily attendance.	5-22 5-23 5-22
4	5-22	• Peak rates may increase if event features headline entertainment. • Impact of weather on time of arrival and/or departure (if open-air venue).	• *Data:* Traffic arrival rate characteristics; Table 5-15. • *Special consideration:* Using historical data to estimate traffic arrival rate.	5-24 5-24
5	5-25	• Use of travel time or distance analysis if no advance ticket sales. • Market area includes the community or region the event is staged for.	• *Special consideration:* Recommended market area analysis methodology. • *Special consideration:* Market area analysis.	5-25 5-25
6	5-27	• Continuous turnover during event. • Use of off-site parking areas.	• *Special consideration:* Parking demand analysis. • *Example:* Designated event off-site parking area; Figure 5-11.	5-27 5-29
7	5-29	• Analysis of conditions prior to, during, and after event.		
8	5-30	• Possible composite traffic volume peak during the event.		
9	6-32	• Design of service to operate throughout the event. • Increased round-trip travel time if loading occurs both at parking areas and at venue.	• *Special consideration:* Shuttle bus service cost.	6-36
10	6-13	• Secure of lease or agreement for off-site lots.		
11	6-38			
12	6-38	• Consideration of ingress and egress operations during the event.		
13	6-40			
14	6-41			
15	6-43		• *Example:* Accommodation of traffic destined to major generators; Figure 6-35.	6-44
16	6-45			
17	6-49			
18	6-51			
19	6-57			
20	6-16	• Two-way traffic during event.		
21	6-20	• Potential use of unpaved parking areas.		
22	6-23	• Variation of parking occupancy during the event.		
23	6-28	• Two-way pedestrian traffic during event.	• *Special consideration:* Pedestrian traffic. • *Example:* Pedestrian access route and emergency access route; Figure 6-22. • *Example:* Road closure adjacent to event venue; Figure 6-24. • *Example:* Staffed mid-block pedestrian crossing; Figure 6-25.	6-27 6-30 6-31 6-31
24	6-32	• Strong consideration for temporary venues.	• *Special consideration:* Disabled parking spaces. • *Example:* Special event disabled parking area access point; Figure 6-26.	6-32 6-32

STEP		EVENT-SPECIFIC ISSUES	EVENT-SPECIFIC REFERENCE INFORMATION	
NO.	PAGE		TOPIC	PAGE
25	6-9	• Analysis of peak period during event as well as peak ingress and egress. • Consideration of detailed analysis (e.g., table-top exercises) for temporary venues.		
26	7-2 to 7-14	• High applicability of HOV incentives, bicyclist accommodation, public transit incentives, and express/charter bus service to this event category.	• *Example:* High occupancy vehicle incentive; Figure 7-2.	7-5
			• *Example:* Bicycle parking area; Figure 7-6.	7-8
			• *Example:* Express bus service.	7-12
27	7-6			
28	6-72			
29	6-61	• Emphasis on portable roadside traveler information devices for temporary venues.		
30	6-70	• Emphasis on portable closed-circuit television, field observation, and/or aerial observation for temporary venues.		
31	7-14	• Key step for infrequent events.	• *Example:* Traffic information dissemination via public agency website; Figure 7-7.	7-16
			• *Example:* Appendix L - Event-specific website.	7-17

- Important advance planning considerations and external factors, summarized in Chapter 5, that influence planning activities. For instance, effective and rapid stakeholder review of event operations planning products requires: (1) an annotated planning timeline, (2) a review process, and (3) performance standards.
- Traffic management plan components in Chapter 6 that provide an overview of various principles driving plan development in addition to a contingency plan checklist.

IMPLEMENTATION AND DAY-OF-EVENT ACTIVITIES

Implementation activities represent an essential phase in advance planning for continuous events. The traffic management team involves new interagency relationships, and it requires an event-specific implementation plan to communicate specifics of the new traffic management plan prepared by the event planning team. Because particular continuous event types occur infrequently, stakeholder simulation exercises prove valuable in assisting traffic management team personnel understand the roles and responsibilities of participating stakeholders in addition to the actions taken on the day-of-event. Equipment testing marks another key consideration. These intensive stakeholder activities reflect the typical unfamiliarity with managing travel for a continuous event coupled with the fact that transportation management activities, on the order required for a planned special event, may not regularly take place in the vicinity of the event venue.

Table 12-4 presents a checklist of implementation and day-of-event activities for stakeholders to consider regarding any continuous event. As indicated in the table, the event planning team must determine, based on various event operations characteristics (e.g., event type, event location, event time of occurrence, attendance, market area, etc.) and other external factors, what unique set of activities apply in handling a specific special event. The table facilitates fast access to handbook

Table 12-4
Checklist of Implementation and Day-of-Event Activities for Continuous Events

HANDBOOK PAGE	ACTION	APPLIES ☑
8-2	• Develop an implementation plan.	☐
8-6	• Conduct a stakeholder simulation exercise(s).	☐
8-8	• Test equipment resources slated for use on the day-of-event.	☐
8-9	• Recruit and train volunteers to fulfill personnel resource needs.	☐
9-2	• Implement a traffic management team management process.	☐
9-4	• Designate a multi-agency command post.	☐
9-6	• Conduct a traffic management plan evaluation(s) during the day-of-event.	☐
9-6	• Establish protocol for traffic management team officials to consider and implement changes to the traffic management plan to accommodate real-time traffic conditions.	☐
9-8	• Establish interagency communication protocol.	☐
9-9	• Review communication equipment compatibility.	☐
9-10	• Use the media to communicate with event patrons and other transportation users.	☐
9-12	• Perform traffic monitoring on the day-of-event.	☐

sections providing detailed guidance, including recommended strategies, protocol, and resource applications, required by users to plan and execute these activities.

Some distinguishing considerations of this event category during the day-of-event activities phase include:

- The scope and duration of continuous events, especially those that occur over multiple days, demand a significant level of personnel resources. Supplementing traffic management team personnel with temporary staff and volunteers may represent a necessary action to meet daily staffing requirements. However, many volunteers have no past experience in tasks associated with traffic and pedestrian control and parking operations. As a result, volunteer training becomes paramount to the success of day-of-event operations. Chapter 8 contains checklists and relevant considerations for assessing personnel resource needs and using volunteers on the day-of-event. The chapter also specifies volunteer training activities and summarizes basic functions required of all volunteers.
- The traffic management team likely includes stakeholder representatives involved in managing travel for a particular continuous event type for the first time. To ensure successful traffic management plan deployment, the traffic management team must adopt a formal management process and establish an interagency communication structure and protocol to support day-of-event operations.
- Other essential team management considerations involve (1) the designation of an Incident Commander for the planned special event and (2) the set up of a temporary, multi-agency command post at or near the event venue.

- Traffic management team officials should anticipate enacting modifications to the traffic management plan throughout the duration of the continuous event.
- Surveillance information and performance evaluation data define transportation operation conditions and, thus, influence decision-making at a day-of-event briefing.
- Multi-day continuous events should include: (1) a traffic management team meeting at the end of each day's activities to review the traffic management plan and team performance and/or (2) a traffic management team meeting before the start of the next event day.
- The collection and evaluation of transportation system performance data proves valuable in guiding decision-making not only on the day-of-event but also for recurring continuous events. Stakeholders can archive raw data for use in future feasibility studies, and various evaluation measures can identify specific areas that require improvement for future, similar events at the subject venue.
- The traffic management team must exercise great care in collecting performance evaluation data in order to ensure data quality and consistency.

POST-EVENT ACTIVITIES

All of the primary products of this phase (e.g., participant evaluation, post-event debriefing, and post-event report) have a high level of applicability to continuous events. Given the infrequent occurrence of continuous events coupled with the scarcity of travel forecast data, post-event activity results represent a key resource in planning for future continuous events in a region.

Table 12-5 presents a checklist of post-event activities for continuous events. The post-event activities section of this handbook provides detailed information on common techniques, special considerations, and recommended protocol that facilitate the activities listed in the table.

Table 12-5
Checklist of Post-Event Activities for Continuous Events

HANDBOOK PAGE	ACTION	APPLIES ☑
10-2	• Review measures of effectiveness identified in event operations planning phase.	☐
10-3	• Compile agency measures of effectiveness.	☐
9-14	• Compile performance evaluation data.	☐
10-5	• Conduct stakeholder participant debriefing.	☐
10-6	• Conduct event patron survey.	☐
10-7	• Conduct public survey.	☐
10-7	• Conduct a post-event debriefing meeting.	☐
10-10	• Prepare a post-event report.	☐

Some distinguishing considerations of this event category during the post-event activities phase include:

- In regard to participant evaluation, continuous event patron travel surveys yield important information and statistics that can assist practitioners in (1) improving the accuracy of future continuous event travel forecasts and (2) developing travel demand management incentives (e.g., public transit incentives and express/charter bus services) for similar events.
- Periodic public surveys warrant consideration for special events under this category as event performance evaluation data fails to assess all community impacts. Survey results alert special event stakeholders of impacts to affected residents and businesses, in addition to non-attendee transportation system users, that may continue to occur with each successive special event at a particular venue location. As a result, stakeholders can develop and implement appropriate strategies (e.g., enforcement, etc.) to mitigate the identified impact(s) for future planned special events.
- Post-event debriefings represent a common and recommended stakeholder activity for continuous events.
    - On a regional level, such meetings may coincide with a regular traffic incident management team meeting.
    - A key aspect of a post-event debriefing for continuous events involves preparing detailed meeting minutes that include the identification of key successes and lessons learned.
    - Considering the potential significant time between similar event types, stakeholders must chronicle participant survey results and debriefing meetings so that those stakeholders charged with managing travel for future continuous events can tap the wisdom of past participants.
- The occurrence of a major, recurring continuous event warrants development of a post-event report. In turn, the report can serve as a working document to assist in advance planning for the next (year's) event.
- A post-event report for a recurring continuous event should include an operational cost analysis to assist stakeholders in identifying potential cost-saving resource deployment strategies for the next event occurrence.

PROGRAM PLANNING

Program planning activities involve the development of policies, programs, and initiatives that facilitate improved planning and management of travel for future planned special events.

Program planning for continuous events include activities, as summarized in Table 12-6, on both a regional and local level.

Some distinguishing considerations of this event category during the program planning phase include:

- A regional transportation committee on planned special events considers the planning and resource requirements of continuous events in connection with managing all planned special events in a region. A primary committee focus concerns facilitating interagency coordination and collaboration. For instance, a task force may exist for a specific large-scale, recurring continuous event that works throughout the year to integrate past event successes and lessons learned into future event planning.

Table 12-6
Program Planning Activities for Continuous Events

PRODUCT	TOPIC	PAGE NO.
Institutional frameworks	• Creation of a regional transportation committee on planned special events (e.g., oversight team).	2-15 4-2 5-3
	• Development of a formal planned special event permit program.	4-10
	• Creation of a transportation operations task force for a recurring continuous event.	5-3
	• Development of a joint operations policy.	5-15
Policies and regulations	• Traffic and parking restrictions.	5-10
	• Public-private towing agreements.	5-16
Infrastructure deployment	• Planned alternate route for diverting background traffic around a venue.	6-40
	• Portable traffic management system.	6-56
	• Express, charter or shuttle bus service.	6-32 7-11 7-12
	• Telephone information systems.	7-17
	• Public information campaign.	7-19

- Two or more stakeholders, representing multiple jurisdictions and/or disciplines, may establish a joint operations policy for managing travel for all planned special events in a region.
- Because continuous events occur infrequently and occasionally at temporary venues, an infrastructure needs assessment on the program planning level should focus on equipment and technology applications transferable to managing all planned special events in a region and/or day-to-day transportation system operations.
- A planned special event permit program proves particularly effective for continuous events that, because of such characteristics as event attendance and event location, may (1) conflict with municipal or state guidelines and regulations and (2) impact transportation operations and the community. The program specifies a permit process, coupled with supporting restrictions and requirements, that allows stakeholders to plan and assess all types of continuous events within a common framework. A section on program planning for local planned special events in Chapter 4 provides complete and in-depth coverage on developing a permit program applicable to continuous events.
- Funding represents a key public agency consideration for continuous events in the program planning phase.
  - Commercial events may involve event organizers and participants from outside the community hosting the event.
  - Prior to initiating event operations planning activities for a specific continuous event, stakeholders should establish a funding mechanism for recovering costs incurred in providing services during the event operations planning phase and resources on the day-of-event.
  - Funding often represents a requirement of a comprehensive planned special event permit program.

CHAPTER THIRTEEN
STREET USE EVENT

Figure 13-1
Street Use Event: New York City Cycling Championship

PURPOSE

In order to assist the user in planning for a particular planned special event, this chapter describes an advance planning and travel management process and considerations specific to a *street use event*. It summarizes recommended policies, guidelines, procedures, and resource applications that were previously discussed in the first ten chapters of this technical reference. This chapter presents these guidelines and procedures in tables, flowcharts, and checklists that can be followed to help guide the user through all the stages of a planned special event of this category for a particular locale. Although Chapter 3 presents all the steps necessary to manage travel for a planned special event, this chapter provides a roadmap to help guide the user through all five phases of managing travel for planned special events, identifying issues, analysis, and products applicable to street use events. To further guide readers, this chapter specifies references to special considerations and best practices relating to this event category.

INTRODUCTION

In order to guide the user, this chapter addresses four key topics, corresponding to five phases of managing travel for planned special events, including: (1) *event operations planning*, (2) *implementation and day-of-event activities*, (3) *post-event activities*, and (4) *program planning*. In planning for

all planned special events in a region, the final section on program planning highlights issues to consider that evolve from and/or pertain to street use events. By following each one of the steps and procedures, the user will have identified and covered all the significant aspects that are necessary to result in successful management of travel for a planned special event with characteristics specific to a street use event.

A street use event occurs on a street requiring temporary closure. Table 13-1 indicates different types of planned special events classified as a street use event. This category includes events that occur in rural, urban, and metropolitan areas. Street use events generally occur in a city or downtown central business district; however, race events, motorcycle rallies, and dignitary motorcades may necessitate temporary closure of arterial streets or, to accommodate a motorcade, limited-access highways. Planned special event permitting guidelines and restrictions typically (1) influence event operations characteristics (e.g., location, street use event route, time of occurrence, etc.) and (2) govern whether a traffic management plan can mitigate the transportation impact of a particular street use event. Table 13-2 lists key characteristics of a street use event.

Table 13-1
Types of Street Use Events

EVENT TYPE
• Parades
• Marathons
• Bicycle races
• Grand Prix auto races
• Motorcycle rallies
• Dignitary motorcades

Table 13-2
Distinguishing Operating Characteristics of a Street Use Event

CHARACTERISTIC
• Occurrence on a roadway requiring temporary closure
• Specific starting and predictable ending times
• Capacity of spectator viewing area not known
• Spectators not charged or ticketed
• Dedicated parking facilities not available

Special Considerations

In light of the characteristics of a street use event, special considerations when planning such an event include:

- Daily attendance, a key input in the travel forecast analysis process, is often difficult to estimate, and day-of-event weather conditions significantly affect it.
- The entire parade or race route represents the event venue.
- Parking areas and traffic flow routes serve an expanded site area.
- Race events or motorcycle rallies often require the temporary closure of roadways over a significant distance.
- Spectator viewing areas may have limited access to transit stations and adjacent high-capacity arterial roadways and freeways.
- High attendance events in downtown areas require extensive planning for parking and travel demand management.
- Major street use events typically generate trips from a multi-county region.
- These events impact parking and access required by nearby neighborhood residents and businesses.
- Temporary road closures, required to stage the event, impact background traffic and transit flow in addition to emergency vehicle access and other local services.

EVENT OPERATIONS PLANNING 

Since street use events take place on the roadway system and different event types have contrasting characteristics (e.g., parades versus road races), the event planning team should develop: (1) a feasibility study, (2) a traffic management plan, and (3) travel demand management initiatives (as necessary) in the event operations planning phase. The stakeholder composition of an event planning team varies by event, as most parades represent community events while road races and motorcycle rallies may involve commercial dealings. In regard to a community-sponsored special event, transportation and/or law enforcement agencies usually bear the responsibility of developing all of the necessary event planning phase products. These stakeholders guide the planning process for commercial street use events as well. Jurisdictions may mandate that private event organizers use a standard route and adhere to numerous guidelines and regulations (e.g., see the street use event checklist contained in Appendix A) developed by public agencies, in the program planning phase, as part of a greater permit program for all planned special events.

Recurring street use events, such as an annual holiday parade, allow stakeholders to reference a past feasibility study and traffic management plan, coupled with operations successes and lessons learned, when conducting advance planning activities for a future event. However, due to the significant time between recurring street use events, the event planning team must anticipate (1) changes in the operations characteristics of a future event, (2) modifications to the transportation system serving the event, and (3) changes in the community (e.g., land use, socioeconomic, regulations, etc.).

Figure 13-2 presents 31 steps in the event operations planning process for all planned special events. The flowchart covers development and integration of the phase's aforementioned three products. Table 13-3 complements the flowchart by providing step-by-step guidance on issues and recommended analyses for a street use event. The table also presents reference information contained in this handbook that is specific to street use events. While all of the major handbook topics under event operations planning apply to a street use event, Table 13-3 indicates planning considerations and agency example applications (e.g., via narratives or photos) within the context of this event category. In turn, practitioners can use example applications presented for a street use event to manage travel for other categories of planned special events.

The flowchart in Figure 13-2 represents a suggested order of event operations planning activities. However, as noted below, the event planning team can modify activities to create a dynamic and more effective planning process tailored to the scope of a specific planned special event:

- A jurisdiction planned special event permit process and requirements will scope, schedule, and direct event operations planning activities for street use events.
- The event planning team should plan an event route, spectator traffic flow routes, and background traffic accommodation strategies early in the event operations planning phase, referencing guidelines and tactics for developing a traffic flow plan (Steps 11 through 16).
- Links between process steps are two-way as stakeholders evaluate alternative strategies and/or integrate traffic management plan components.

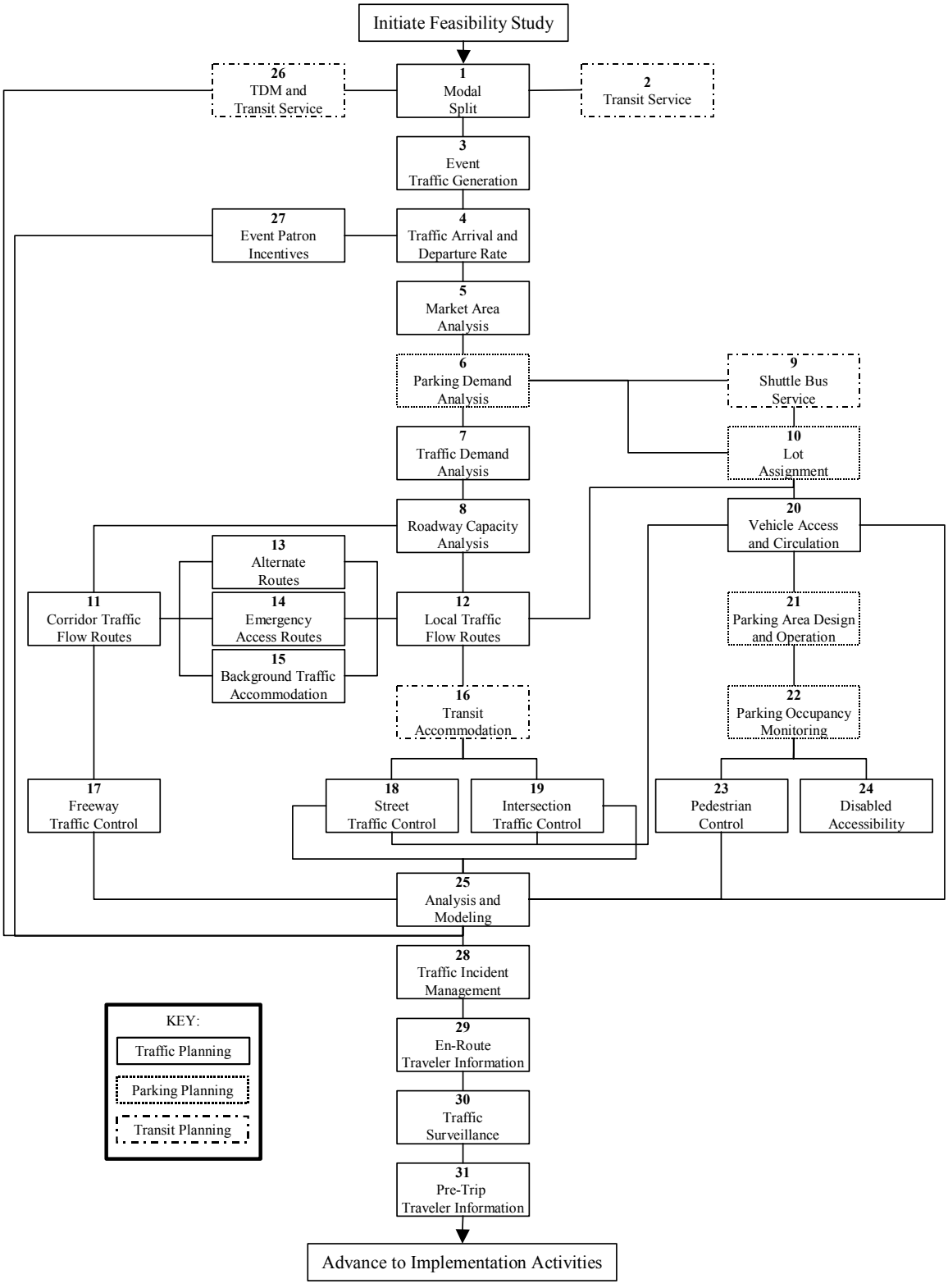

Figure 13-2
Event Operations Planning Process Flowchart

Table 13-3
Event Operations Planning Steps
Street Use Event

STEP NO.	STEP PAGE	EVENT-SPECIFIC ISSUES	EVENT-SPECIFIC REFERENCE INFORMATION TOPIC	PAGE
1	5-20			
2	7-9			
3	5-21	• Impact of weather on attendance. • Difficult to estimate attendance. • Lack of historical traffic generation data.	• *Special consideration:* Estimating attendance.	5-22
4	5-22	• Impact of weather on time of arrival and/or departure.	• *Special consideration:* Using historical data to estimate traffic arrival rate.	5-24
5	5-25	• Use of travel time or distance analysis. • Market area includes the community or region the event is staged for.	• *Special consideration:* Recommended market area analysis methodology. • *Special consideration:* Market area analysis.	5-25 5-25
6	5-27	• Low turnover during event. • Exclusive use of off-site parking areas. • Self-parking.	• *Special consideration:* Parking demand analysis.	5-27
7	5-29	• Requirement of road closures to stage the event. • Utility (e.g., attractiveness) of individual parking areas vary.		
8	5-30	• Use of computer traffic simulation model to measure the full impact of road closures on operations across a network of streets.		
9	6-32	• Design of service to expand and contract (e.g., number of buses operating) based on event patron arrival/departure rates throughout the day-of-event.		
10	6-13			
11	6-38			
12	6-38		• *Special consideration:* Road closure impact checklist; Table 6-22 • *Special consideration:* Parade staging area; Figure 6-29	6-38 6-38
13	6-40	• Consideration for road closures required to stage the event.	• *Special consideration:* Personnel resources for alternate route plan deployment; Figure 6-33.	6-43
14	6-41	• Ambulances or first-aid stations staged at various locations for a street race.	• *Special consideration:* Emergency access lanes.	6-43
15	6-43	• Key consideration for this event category.	• *Special consideration:* Pre-trip traveler information; Table 6-27.	6-45
16	6-45			
17	6-49		• *Example:* Appendix K – Street control plan and equipment location plan.	6-59
18	6-51		• *Example:* Appendix K – Street control plan and equipment location plan.	6-59
19	6-57		• *Special consideration:* Intersection traffic control along the event route. • *Example:* Appendix K – Street control plan and equipment location plan.	6-58 6-59
20	6-16	• Circulation problems due to lack of dedicated parking facilities.		
21	6-20	• Consideration only for privately operated parking areas.		
22	6-23	• Coordination with private parking area operators.		
23	6-28	• High volume of pedestrian traffic and continuous circulation around the venue perimeter.	• *Special consideration:* Pedestrian traffic.	6-27
24	6-32	• Strong consideration for this event category.	• *Special consideration:* Disabled parking spaces.	6-32
25	6-9	• Consideration of detailed analysis (e.g., tabletop exercises) and modeling.		

STEP		EVENT-SPECIFIC ISSUES	EVENT-SPECIFIC REFERENCE INFORMATION	
NO.	PAGE		TOPIC	PAGE
26	7-2 to 7-14	• High applicability of bicyclist accommodation, public transit incentives, and event/charter bus service to this event category. • Applicability of local travel demand management to downtown events.		
27	7-6	• Particularly applicable to managing event departure rate.		
28	6-72			
29	6-61	• Emphasis on portable closed-circuit television, field observation, and/or aerial observation.		
30	6-70			
31	7-14	• Key step for infrequent events.		

- The event planning team can develop different traffic management plan components concurrently.

The event operations planning process references information and concepts contained in the advance planning section of this handbook, and it directs the user to recommended guidelines, procedures, strategies, and resource applications for managing travel for a specific planned special event. When following the process, practitioners should review:

- Important advance planning considerations and external factors, summarized in Chapter 5, that influence planning activities. For instance, effective and rapid stakeholder review of event operations planning products requires: (1) an annotated planning timeline, (2) a review process, and (3) performance standards. Under risk assessment, scenarios relating to unplanned demonstrations or event patron violence may warrant consideration for a particular special event if law enforcement intelligence reports indicate such potential.
- Section on "Special Considerations" in Chapter 6 with regard to controlling traffic during a dignitary motorcade.
- Traffic management plan components in Chapter 6 that provide an overview of various principles driving plan development in addition to a contingency plan checklist.

IMPLEMENTATION AND DAY-OF-EVENT ACTIVITIES

Implementation activities represent an essential phase in advance planning for street use events. The traffic management team may involve new interagency relationships, and it requires an event-specific implementation plan to communicate specifics of the new traffic management plan prepared by the event planning team. Because particular street use event types occur infrequently, stakeholder simulation exercises prove valuable in assisting traffic management team personnel understand the roles and responsibilities of participating stakeholders in addition to the actions taken on the day-of-event. Equipment testing marks another key consideration as day-of-event operations at and in the vicinity of the event site usually depend on portable equipment for traffic control, surveillance, and dissemination of en-route traveler information. These intensive stakeholder activities reflect the typical unfamiliarity with managing travel for a street use event coupled with the fact that transportation management activities, on the order required for a planned special event,

may not regularly take place in the vicinity of the event site.

Table 13-4 presents a checklist of implementation and day-of-event activities for stakeholders to consider regarding any street use event. As indicated in the table, the event planning team must determine, based on various event operations characteristics (e.g., event type, event location, event time of occurrence, attendance, market area, etc.) and other external factors, what unique set of activities apply in handling a specific special event. The table facilitates fast access to handbook sections providing detailed guidance, including recommended strategies, protocol, and resource applications, required by users to plan and execute these activities.

Some distinguishing considerations of this event category during the day-of-event activities phase include:

- Street use events demand the use of experienced personnel in the field on the day-of-event. Law enforcement officers or other personnel properly trained in traffic control should (1) direct traffic at intersections adjacent to closed streets and (2) control pedestrian crossing locations.
- Supplementing traffic management team personnel with temporary staff and volunteers may represent a necessary action to meet staffing requirements. Competent adult volunteers can monitor barricade placement and minor intersection/driveway approaches. Many volunteers have no past experience in tasks associated with traffic and pedestrian control and parking operations. As a result, volunteer training becomes paramount to the success of day-of-event operations. Chapter 8 contains checklists and relevant considerations for assessing personnel resource needs and using volunteers on the day-of-event. The chapter also specifies volunteer training activities and summarizes basic functions required of all volunteers.

Table 13-4
Checklist of Implementation and Day-of-Event Activities for Street Use Events

HANDBOOK PAGE	ACTION	APPLIES ☑
8-2	• Develop an implementation plan.	☐
8-6	• Conduct a stakeholder simulation exercise(s).	☐
8-8	• Test equipment resources slated for use on the day-of-event.	☐
8-9	• Recruit and train volunteers to fulfill personnel resource needs.	☐
9-2	• Implement a traffic management team management process.	☐
9-4	• Designate a multi-agency command post.	☐
9-6	• Conduct a traffic management plan evaluation(s) during the day-of-event.	☐
9-6	• Establish protocol for traffic management team officials to consider and implement changes to the traffic management plan to accommodate real-time traffic conditions.	☐
9-8	• Establish interagency communication protocol.	☐
9-9	• Review communication equipment compatibility.	☐
9-10	• Use the media to communicate with event patrons and other transportation users.	☐
9-12	• Perform traffic monitoring on the day-of-event.	☐

- The traffic management team likely includes stakeholder representatives involved in managing travel for a particular street use event type for the first time. To ensure successful traffic management plan deployment, the traffic management team must adopt a formal management process and establish an interagency communication structure and protocol to support day-of-event operations.
- Other essential team management considerations involve (1) the designation of an Incident Commander for the planned special event and (2) the set up of a temporary, multi-agency command post at or near the event site.
- Traffic management team officials should anticipate enacting modifications to the traffic management plan during the street use event.
- Surveillance information and performance evaluation data define transportation operation conditions and, thus, influence decision-making at a day-of-event briefing.
- Due to the challenge of estimating event-generated traffic in the event feasibility study, day-of-event briefings should occur at frequent intervals during event ingress operations. Moreover, traffic management team officials should conduct an expanded briefing prior to the end of the event in order to reassess the traffic management and implementation plan for egress operations, taking into consideration traffic and pedestrian demand observed during ingress in addition to traffic and transit operations on alternate routes.
- The collection and evaluation of transportation system performance data proves valuable in guiding decision-making not only on the day-of-event but also for recurring street use events (e.g., annual parades or street races). Stakeholders can archive raw data for use in future feasibility studies, and various evaluation measures can identify specific areas that require improvement for future, similar events using the same route.
- The traffic management team must exercise great care in collecting performance evaluation data in order to ensure data quality and consistency.

POST-EVENT ACTIVITIES

All of the primary products of this phase, particularly participant evaluations and post-event debriefings, apply to evaluating transportation operations for street use events. Given the infrequent occurrence of street use events coupled with the scarcity of travel forecast data, post-event activity results represent a key resource in planning for future street use events in a region.

Table 13-5 presents a checklist of post-event activities for street use events. The post-event activities section of this handbook provides detailed information on common techniques, special considerations, and recommended protocol that facilitate the activities listed in the table.

Some distinguishing considerations of this event category during the post-event activities phase include:

- In regard to participant evaluation, street use event patron travel surveys yield important information and statistics that can assist practitioners in (1) improving the accuracy of future street use event travel forecasts and (2) developing travel demand management incentives (e.g., public transit incentives and express/charter bus services) for similar events.

Table 13-5
Checklist of Post-Event Activities for Street Use Events

HANDBOOK PAGE	ACTION	APPLIES ☑
10-2	• Review measures of effectiveness identified in event operations planning phase.	☐
10-3	• Compile agency measures of effectiveness.	☐
9-14	• Compile performance evaluation data.	☐
10-5	• Conduct stakeholder participant debriefing.	☐
10-6	• Conduct event patron survey.	☐
10-7	• Conduct public survey.	☐
10-7	• Conduct a post-event debriefing meeting.	☐
10-10	• Prepare a post-event report.	☐

- Periodic public surveys warrant consideration for special events under this category as event performance evaluation data fails to assess all community impacts. Survey results alert special event stakeholders of impacts to affected residents and businesses, in addition to non-attendee transportation system users, that may continue to occur with each successive special event on a particular route. As a result, stakeholders can develop and implement appropriate strategies (e.g., create/revise a standard street use event route, revise alternate route plans, etc.) and regulations to mitigate the identified impact(s) for future planned special events.
- Post-event debriefings represent a common and recommended stakeholder activity for street use events.
  - On a regional level, such meetings may coincide with a regular traffic incident management team meeting.
  - A key aspect of a post-event debriefing for street use events involves preparing detailed meeting minutes that include the identification of key successes and lessons learned. In turn, findings may refine special event permit program provisions for future street use events.
  - Considering the potential significant time between similar event types, stakeholders must chronicle participant survey results and debriefing meetings so that those stakeholders charged with managing travel for future street use events can tap the wisdom of past participants.
- The occurrence of a major, recurring street use event warrants development or update of a post-event report. In turn, the report can serve as a working document to assist in advance planning for the next (year's) event.
- A post-event report for a recurring street use event should include an operational cost analysis to assist stakeholders in identifying potential cost-saving resource deployment strategies for the next event occurrence.

PROGRAM PLANNING

Program planning activities involve the development of policies, programs, and initiatives that facilitate improved planning and management of travel for future planned special events.

Program planning for street use events include activities, as summarized in Table 13-6, on both a regional and local level.

Some distinguishing considerations of this event category during the program planning phase include:

- A regional transportation committee on planned special events considers the planning and resource requirements of street use events in connection with managing all planned special events in a region. A primary committee focus concerns facilitating interagency coordination and collaboration. For instance, a task force may exist for a specific large-scale, recurring street use event that works throughout the year to integrate past event successes and lessons learned into future event planning.
- Two or more stakeholders, representing multiple jurisdictions and/or disciplines, may establish a joint operations policy for managing travel for all planned special events in a region.
- Stakeholders may develop a standard route for all street use events of a certain type (e.g., parades, street races, etc.) that occur within a region or jurisdiction in order to create a more efficient event operations planning process for future street use events.
- Because street use events occur infrequently and on the roadway system, an infrastructure needs assessment on the program planning level should focus on equipment and technology applications transferable to managing all planned special events in a region and/or day-to-day transportation system operations.

Table 13-6
Program Planning Activities for Street Use Events

PRODUCT	TOPIC	PAGE NO.
Institutional frameworks	• Creation of a regional transportation committee on planned special events (e.g., oversight team).	2-15 4-2 5-3
	• Development of a formal planned special event permit program.	4-10
	• Creation of a transportation operations task force for a recurring street use event.	5-3
	• Development of a joint operations policy.	5-15
Policies and regulations	• Traffic and parking restrictions.	5-10
	• Standard street use event routes.	5-15
	• Public-private towing agreements.	5-16
Infrastructure deployment	• Planned alternate route for diverting background traffic around a venue.	6-40
	• Portable traffic management system.	6-56
	• Express, charter or shuttle bus service.	6-32 7-11 7-12
	• Telephone information systems.	7-17
	• Public information campaign.	7-19

- A planned special event permit program proves particularly effective for street use events that, because of such characteristics as event attendance, event time of occurrence, and event location (e.g., route), may (1) conflict with municipal or state guidelines and regulations and (2) impact transportation operations and the community. The program specifies a permit process, coupled with supporting restrictions and requirements, that allows stakeholders to plan and assess all types of street use events within a common framework. For instance, stakeholder review of a proposed event route represents one step in the permit process in addition to a key decision criteria for rendering permit application approval. A section on program planning for local planned special events in Chapter 4 provides complete and in-depth coverage on developing a permit program applicable to street use events.
- Funding represents a key public agency consideration for street use events in the program planning phase.
    - Commercial events may involve event organizers and participants from outside the community hosting the event.
    - Prior to initiating event operations planning activities for a specific street use event, stakeholders should establish a funding mechanism for recovering costs incurred in providing services during the event operations planning phase and resources (e.g., namely personnel for traffic control) on the day-of-event.
    - Funding often represents a requirement of a comprehensive planned special event permit program.

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CHAPTER FOURTEEN
REGIONAL/MULTI-VENUE EVENT

Figure 14-1
Regional/Multi-Venue Event: Bradley Center, U.S. Cellular Arena,
and Midwest Airlines Center (convention center) Adjacent to 4th Street in Milwaukee, WI

PURPOSE

In order to assist the user in planning for a particular planned special event, this chapter describes an advance planning and travel management process and considerations specific to a *regional/multi-venue event*. It summarizes recommended policies, guidelines, procedures, and resource applications that were previously discussed in the first ten chapters of this technical reference. This chapter presents these guidelines and procedures in tables, flowcharts, and checklists that can be followed to help guide the user through all the stages of a planned special event of this category for a particular locale. Although Chapter 3 presents all the steps necessary to manage travel for a planned special event, this chapter provides a roadmap to help guide the user through all five phases of managing travel for planned special events, identifying issues, analysis, and products applicable to regional/multi-venue events. To further guide readers, this chapter specifies references to special considerations and best practices relating to this event category.

INTRODUCTION

In order to guide the user, this chapter addresses four key topics, corresponding to five phases of managing travel for planned special events, including: (1) *event opera-*

tions planning, (2) *implementation and day-of-event activities*, (3) *post-event activities*, and (4) *program planning*. In planning for all planned special events in a region, the final section on program planning highlights issues to consider that evolve from and/or pertain to regional/multi-venue events. By following each one of the steps and procedures, the user will have identified and covered all the significant aspects that are necessary to result in successful management of travel for a planned special event with characteristics specific to a regional/multi-venue event.

A regional/multi-venue event refers to multiple planned special events that occur within a region at or near the same time. Individual events may differ by classification category. Table 14-1 indicates different types of planned special events classified as a regional/multi-venue event. Concurrent planned special events require consideration as a regional/multi-venue event if traffic generated by different, competing special events use the same traffic flow routes (e.g., freeway/arterial corridors, local streets) or parking areas over the same time frame. As a result, stakeholders involved in planning and managing individual special events must, as a group, forecast and mitigate the global impact of concurrent special events on transportation system operations. Table 14-2 lists key characteristics of a regional/multi-venue event.

Table 14-1
Types of Regional/Multi-Venue Events

EVENT TYPE
• Occurrence of a single-theme event requiring multiple venues to stage the event • Occurrence of a downtown parade or festival in the vicinity of a downtown fixed venue also hosting a special event • Occurrence of special events at two fixed venues in a region at or near the same time

Table 14-2
Distinguishing Operating Characteristics of a Regional/Multi-Venue Event

CHARACTERISTIC
• Occurrence of events at multiple venues and at or near the same time • Events having a time specific duration, a continuous duration, or both • Overall capacity generally not known if continuous events or street use events are involved

Special Considerations

In light of the characteristics of a regional/multi-venue event, special considerations when planning such an event include:

- Traffic flow routes to/from different events may use the same road segments, and predominant traffic demand occurs in the same or opposite directions.
- Traffic flow routes that serve different special event venues may intersect.
- Overflow parking areas typically reserved for a recurring special event or permanent venue may be required to accommodate demand from nearby concurrent events.
- Ingress and egress operations for concurrent events may occur at the same time.
- Event patrons and participants may travel from one planned special event to another.
- Traffic control and traveler information for different special events can confuse event patrons.

EVENT OPERATIONS PLANNING 

Planned regional/multi-venue events include, for example, multi-day sporting games (e.g., Olympic style) that require multiple venues to stage various events and major fireworks displays in areas offering

several vantage points (e.g., parks, etc.) spread out over a large area. Other regional/multi-venue events evolve as a result of individual planned special events slated to occur within a region at or near the same time. These events involve any combination of discrete/recurring events at a permanent venue, continuous events, and street use events. As a result, the collective regional/multi-venue event often represents a one-time occurrence, particularly if one or more individual events involve a sporting or concert event. Concurrent events may span one day or multiple days.

The scope and infrequent occurrence of a regional/multi-venue event generally requires the event planning team(s) to develop: (1) a feasibility study, (2) a traffic management plan, and (3) travel demand management initiatives (as necessary) in the event operations planning phase. The overall event operations planning approach for a regional/multi-venue event remains the same for all event types. That is, the event planning team should first develop preliminary event operations products on a venue-by-venue basis and then combine and evaluate venue-specific findings and recommended mitigation actions for the regional/multi-venue event. The latter step helps to determine: (1) additional transportation system capacity constraints not identified in individual event/venue analyses, (2) potential conflicts in event/venue traffic management plan provisions, and (3) additional mitigation measures designed to improve transportation operations for the overall regional/multi-venue event.

A regional/multi-venue event places an emphasis on interagency coordination and collaboration. Each venue event may involve a distinct group of planning and operations stakeholders if individual events within a region do not relate to each other. Event operations planning for a regional/multi-venue event requires input and participation by all involved stakeholder groups. Public agency stakeholders responsible for the planning or approval of individual venue events should facilitate interaction between event planning teams and ensure mitigation of transportation and community impacts from the composite regional/multi-venue event.

Figure 14-2 presents 31 steps in the event operations planning process for all planned special events. The flowchart covers development and integration of the phase's aforementioned three products. Table 14-3 complements the flowchart by providing step-by-step guidance on issues and recommended analyses for a regional/multi-venue event. The table also presents reference information contained in this handbook that is specific to regional/multi-venue events. While all of the major handbook topics under event operations planning apply to a regional/multi-venue event, Table 14-3 indicates planning considerations and agency example applications (e.g., via narratives or figures) within the context of this event category. In turn, practitioners can use example applications presented for a regional/multi-venue event to manage travel for other categories of planned special events.

The flowchart in Figure 14-2 represents a suggested order of event operations planning activities. However, as noted below, the event planning team can modify activities to create a dynamic and more effective planning process tailored to the scope of a specific planned special event:

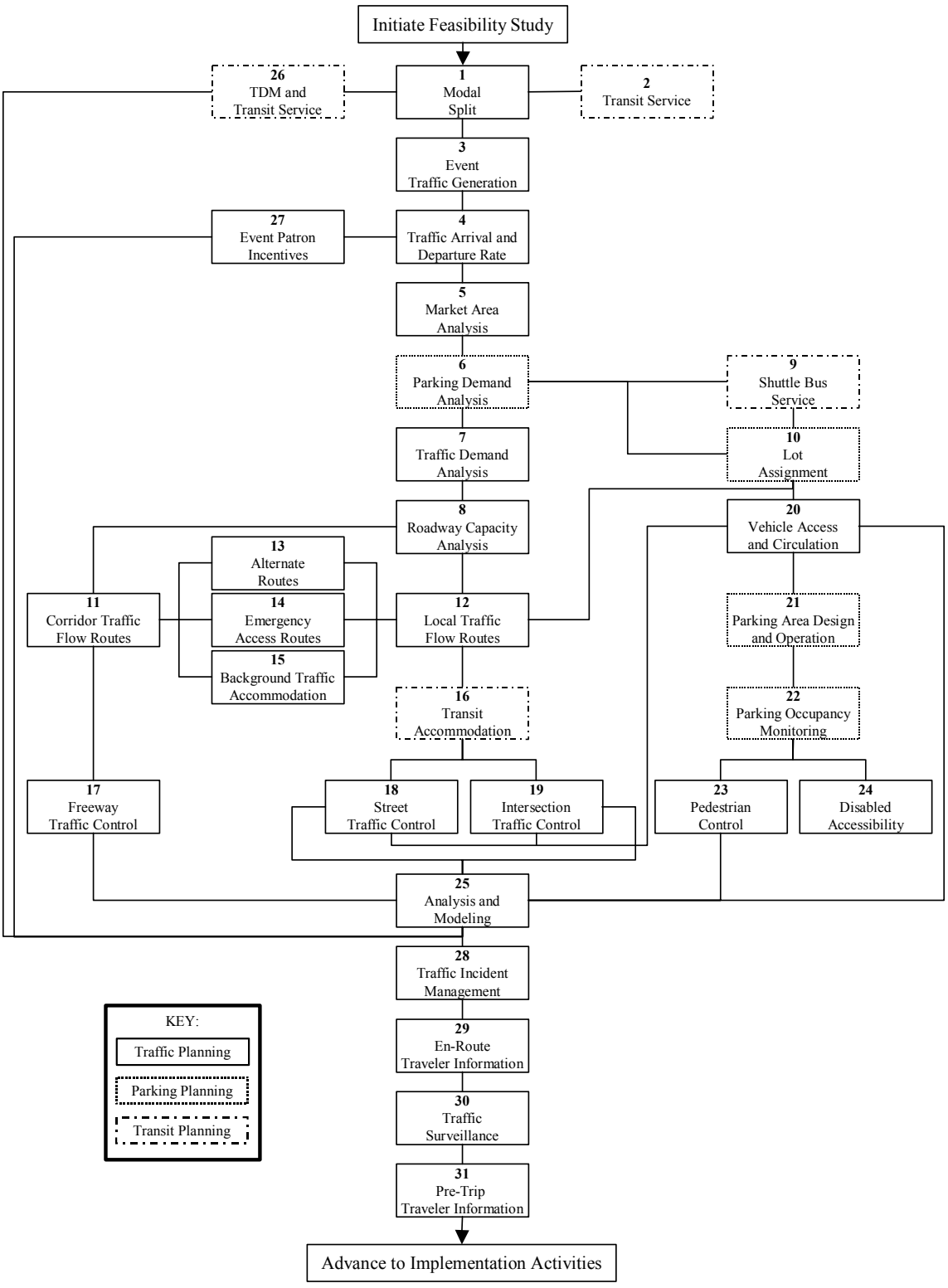

Figure 14-2
Event Operations Planning Process Flowchart

Table 14-3
Event Operations Planning Steps
Regional/Multi-Venue Event

STEP NO.	STEP PAGE	EVENT-SPECIFIC ISSUES	EVENT-SPECIFIC REFERENCE INFORMATION TOPIC	PAGE
1	5-20	• Performance of step for each individual event.		
2	7-9	• Potential financial incentive for transit service to expand service or provide express/charter service.		
3	5-21	• Performance of step for each individual event.		
4	5-22	• Performance of step for each individual event.		
5	5-25	• Performance of step for each individual event.		
6	5-27	• Variable demand rates from different events. • Staggering of event times creates continuous turnover over the course of the day-of-event.	• *Special consideration:* Parking demand analysis.	5-27
			• *Special consideration:* Shared parking operation.	5-27
			• *Example:* Parking occupancy summary; Table 5-17.	5-29
7	5-29	• Performance of step for each individual event.	• *Example:* Preliminary road segment capacity analysis; Figure 5-13.	5-30
8	5-30	• Analysis of multiple time periods.		
9	6-32	• Design of service specific to individual parking areas or events. • Establish service, as necessary, to accommodate satellite parking areas (e.g., event patron and employee parking), transit stations, and event participants (e.g., to/from area hotels).		
10	6-13	• Conflict concerning multiple events using one lot.		
11	6-38			
12	6-38	• Multiple events using the same traffic flow route.		
13	6-40			
14	6-41	• Evaluation of needs for each individual event.		
15	6-43	• Key consideration if road closures are required to stage an event(s).		
16	6-45			
17	6-49			
18	6-51			
19	6-57			
20	6-16	• Circulation conflicts caused by multiple events in the same area.		
21	6-20			
22	6-23	• Circulation conflicts caused by multiple events in the same area.	• *Example:* Parking occupancy monitoring plan; Table 6-11.	6-24
23	6-28	• Consideration of pedestrian access routes that connect different venues.		
24	6-32			
25	6-9	• Consideration of detailed analysis (e.g., table-top exercises) and modeling.		
26	7-2 to 7-14	• High applicability of all travel demand management initiatives to this event category.	• *Example:* Local travel demand management techniques.	7-8
			• *Example:* Express bus service.	7-11
27	7-6	• Performance of step for each individual event.	• *Example:* Event patron incentives; Figure 7-5.	7-7
28	6-72	• Key consideration for freeway corridors within a region.	• *Example:* Traffic incident quick clearance strategies; Table 6-40.	6-75
29	6-61			
30	6-70			
31	7-14	• Key step for infrequent events.	• *Example:* Dissemination of pre-trip traveler information via the Internet.	7-17
			• *Example:* Use of 511 service for a planned special event.	7-18

- The event planning team should repeat process steps, as indicated in Table 14-3, for individual venue events comprising the regional/multi-venue event.
- Final planning products should account for the overall impact of the regional/multi-venue event.
- Links between process steps are two-way as stakeholders evaluate alternative strategies and/or integrate traffic management plan components.
- The event planning team can develop different traffic management plan components concurrently.

The event operations planning process references information and concepts contained in the advance planning section of this handbook, and it directs the user to recommended guidelines, procedures, strategies, and resource applications for managing travel for a specific planned special event. When following the process, practitioners should review:

- Advance planning and travel management process and considerations provided in Chapters 11 through 13, as appropriate, for individual venue events comprising the regional/multi-venue event.
- Important advance planning considerations and external factors, summarized in Chapter 5, that influence planning activities.
- Section on "Special Considerations" in Chapter 6 with regard to transporting dignitaries and event participants.
- Traffic management plan components in Chapter 6 that provide an overview of various principles driving plan development in addition to a contingency plan checklist.

IMPLEMENTATION AND DAY-OF-EVENT ACTIVITIES

Implementation activities represent an essential phase in advance planning for regional/multi-venue events. Depending on event type, one traffic management team may handle day-of-event operations for multiple venues (e.g., sporting games) or a single venue. Nonetheless, implementation plans for individual event venues must correlate in terms of traffic control strategies deployed and resources used. Such specifications can be organized through matrices for easy reference.

Because regional/multi-venue events occur infrequently, stakeholder simulation exercises prove valuable in assisting traffic management team supervisors and field personnel understand the roles and responsibilities of participating stakeholders in addition to the operations game plan and actions for individual venue events. Tabletop exercises allow traffic management team officials to review the impact of certain event-specific action plans on other concurrent events. A full-scale simulation proves advantageous by providing venue managers and transportation operators, stationed at various command posts (e.g., on-site and at the transportation management center), with the opportunity to test the communications infrastructure used on the day-of-event. These intensive stakeholder activities reflect the typical unfamiliarity with managing travel for a regional/multi-venue event coupled with the fact that transportation management activities usually performed for a particular, recurring special event may require modification to accommodate nearby concurrent planned special events.

Table 14-4 presents a checklist of implementation and day-of-event activities for stakeholders to consider regarding any regional/multi-venue event. The event planning team must determine, based on various event operations characteristics (e.g., event type, event location, event time of occurrence, attendance, market area, etc.) and other external factors, what unique set of activities apply in handling all venue events comprising a regional/multi-venue special event. In turn, stakeholders should review the special considerations and recommended activities presented in Chapters 11 through 13 for pertinent individual special events. The table facilitates fast access to handbook sections providing detailed guidance, including recommended strategies, protocol, and resource applications, required by users to plan and execute these activities.

Some distinguishing considerations of this event category during the day-of-event activities phase include:

- The scope of regional/multi-venue events demand a significant level of personnel resources. Supplementing traffic management team personnel with temporary staff and volunteers may represent a necessary action to meet staffing requirements for all concurrent special events. Many volunteers have no past experience in tasks associated with traffic and pedestrian control and parking operations. As a result, volunteer training becomes paramount to the success of day-of-event operations. Chapter 8 contains checklists and relevant considerations for assessing personnel resource needs and using volunteers on the day-of-event. The chapter also specifies volunteer training activities and summarizes basic functions required of all volunteers.

Table 14-4
Checklist of Implementation and Day-of-Event Activities for Regional/Multi-Venue Events

HANDBOOK PAGE	ACTION	APPLIES ☑
8-2	• Develop an implementation plan.	☐
8-6	• Conduct a stakeholder simulation exercise(s).	☐
8-8	• Test equipment resources slated for use on the day-of-event.	☐
8-9	• Recruit and train volunteers to fulfill personnel resource needs.	☐
9-2	• Implement a traffic management team management process.	☐
9-4	• Designate a multi-agency command post.	☐
9-6	• Conduct a traffic management plan evaluation(s) during the day-of-event.	☐
9-6	• Establish protocol for traffic management team officials to consider and implement changes to the traffic management plan to accommodate real-time traffic conditions.	☐
9-8	• Establish interagency communication protocol.	☐
9-9	• Review communication equipment compatibility.	☐
9-10	• Use the media to communicate with event patrons and other transportation users.	☐
9-12	• Perform traffic monitoring on the day-of-event.	☐

- Multi-venue events may strain available stakeholder resources needed to manage travel in the vicinity of a particular event venue; therefore, traffic management team officials should reconfirm the availability of necessary traffic control and communications equipment prior to the day-of-event.
- To ensure successful traffic management plan deployment and coordination across all venue locations, the traffic management team(s) must establish an inter-agency communication structure and protocol to support regional/multi-venue event operations on the day-of-event.
- Other essential team management considerations involve the set up of a command post, most likely at a regional transportation management center, for monitoring and managing all venue events.
- Traffic management team officials should anticipate enacting modifications to the traffic management plan(s) during the regional/multi-venue event.
- Surveillance information and performance evaluation data define transportation operation conditions and, thus, influence decision-making at a day-of-event briefing.
- Day-of-event briefings should occur at key breakpoints, such as at the end of ingress/egress operations for a particular venue event, during a regional/multi-venue event. This allows traffic management team officials to reassess the traffic management and implementation plan for all concurrent events and make revisions as necessary.

POST-EVENT ACTIVITIES

Table 14-5 presents a checklist of post-event activities for regional/multi-venue events. The post-event activities section of this handbook provides detailed information on common techniques, special considerations, and recommended protocol that facilitate the activities listed in the table.

Some distinguishing considerations of this event category during the post-event activities phase include:

Table 14-5
Checklist of Post-Event Activities for Regional/Multi-Venue Events

HANDBOOK PAGE	ACTION	APPLIES ☑
10-2	• Review measures of effectiveness identified in event operations planning phase.	☐
10-3	• Compile agency measures of effectiveness.	☐
9-14	• Compile performance evaluation data.	☐
10-5	• Conduct stakeholder participant debriefing.	☐
10-6	• Conduct event patron survey.	☐
10-7	• Conduct public survey.	☐
10-7	• Conduct a post-event debriefing meeting.	☐
10-10	• Prepare a post-event report.	☐

- With regard to regional/multi-venue events consisting of individual non-related venue events occurring at or near the same time, stakeholders may conduct post-event activities specific to individual events.
- Practitioners should reference the post-event activities guidelines and considerations contained in Chapters 11 through 13, as appropriate, for individual venue events comprising the regional/multi-venue event.
- Post-event debriefings represent a common and recommended stakeholder activity for all regional/multi-venue events.
  - On a regional level, such meetings may coincide with a regular traffic incident management team meeting.
  - The meeting agenda should include discussion topics on the planning process, interagency communication, and coordination of travel management activities among individual venue events on the day-of-event.
  - A key aspect of a post-event debriefing for regional/multi-venue events involves preparing detailed meeting minutes that include the identification of key successes and lessons learned.
  - Considering the potential significant time between regional/multi-venue events, stakeholders must chronicle debriefing meetings so that those stakeholders charged with managing travel for future events can tap the wisdom of past participants.
- The occurrence of a major, single-theme regional/multi-venue event warrants participant evaluations and the development of a post-event report. Given the infrequent occurrence of this event type, post-event activity results represent a key resource in planning for the next event occurrence either in the host region or another locale (e.g., for roving regional/multi-venue events).

PROGRAM PLANNING

Program planning activities involve the development of policies, programs, and initiatives that facilitate improved planning and management of travel for future planned special events.

Program planning for regional/multi-venue events include activities, as summarized in Table 14-6, aimed at facilitating interagency coordination both during the event operations planning phase and on the day-of-event when concurrent venue events take place. Practitioners should reference program planning activities contained in Chapters 11 through 13, as appropriate, for individual venue events comprising the regional/multi-venue event. These handbook chapters also describe and recommend various considerations concerning policies, regulations, and infrastructure deployment potentially applicable to recurring, single-theme regional/multi-venue events.

Some distinguishing considerations of this event category during the program planning phase include:

- A regional transportation committee on planned special events considers the planning and resource requirements of regional/multi-venue events in connection with managing all planned special events in a region. A primary committee focus concerns facilitating interagency coordination and collaboration. For instance, the committee may form a task force if stakeholders expect that multiple

Table 14-6
Program Planning Activities for Regional/Multi-Venue Events

PRODUCT	TOPIC	PAGE NO.
Institutional frameworks	• Creation of a regional transportation committee on planned special events (e.g., oversight team).	2-15 4-2 5-3
	• Development of a formal planned special event permit program.	4-10
	• Creation of a transportation operations task force for a regional/multi-venue event.	5-3
	• Development of a joint operations policy.	5-15
	• Development of a mutual-aid agreement to facilitate resource sharing.	5-15

venue events will impact the same traffic flow routes and/or parking areas over the same time frame, thus requiring planning and operation as a regional/multi-venue event.

- Two or more stakeholders, representing multiple jurisdictions and/or disciplines, may establish a joint operations policy to ensure a cooperative effort in managing travel for all planned special events in a region.
- Stakeholders may develop a mutual-aid agreement to facilitate resource sharing and/or reimbursement for services in order to handle future planned special events, particularly events under this category.
- A planned special event permit program proves particularly effective for regional/multi-venue events that, because of such characteristics as event attendance, event times of occurrence, and event locations may (1) conflict with municipal or state guidelines and regulations and (2) impact transportation operations and the community. For instance, permit regulations may restrict the approval of a particular planned special event if it conflicts with another planned special event. A section on program planning for local planned special events in Chapter 4 provides complete and in-depth coverage on developing a permit program applicable to regional/multi-venue events and other planned special event categories, notably continuous events and street use events.
- Funding represents a key public agency consideration for regional/multi-venue events in the program planning phase.
  - Commercial events may involve event organizers and participants from outside the community hosting the event.
  - Prior to initiating event operations planning activities for a specific regional/multi-venue event, stakeholders should establish a funding mechanism for recovering costs incurred in providing services during the event operations planning phase and resources on the day-of-event.
  - Funding often represents a requirement of a comprehensive planned special event permit program.

CHAPTER FIFTEEN
RURAL EVENT

Figure 15-1
Rural Event: U.S. Open Championship in Southampton, NY

PURPOSE

In order to assist the user in planning for a particular planned special event, this chapter describes an advance planning and travel management process and considerations specific to a *rural event*. It summarizes recommended policies, guidelines, procedures, and resource applications that were previously discussed in the first ten chapters of this technical reference. This chapter presents these guidelines and procedures in tables, flowcharts, and checklists that can be followed to help guide the user through all the stages of a planned special event of this category for a particular locale. Although Chapter 3 presents all the steps necessary to manage travel for a planned special event, this chapter provides a roadmap to help guide the user through all five phases of managing travel for planned special events, identifying issues, analysis, and products applicable to rural events. To further guide readers, this chapter specifies references to best practices relating to this event category.

INTRODUCTION

In order to guide the user, this chapter addresses four key topics, corresponding to five phases of managing travel for planned special events, including: (1) *event operations planning*, (2) *implementation and day-of-event activities*, (3) *post-event activities*,

and (4) *program planning*. In planning for all planned special events in a region, the final section on program planning highlights issues to consider that evolve from and/or pertain to rural events. By following each one of the steps and procedures, the user will have identified and covered all the significant aspects that are necessary to result in successful management of travel for a planned special event with characteristics specific to a rural event.

A rural event encompasses any discrete/recurring event or continuous event that occurs in a rural area. Table 15-1 indicates different types of planned special events classified as a rural event. Rural events collectively have the event operation characteristics of discrete/recurring events at a permanent venue and continuous events with one notable exception; rural events take place in rural areas. Table 15-2 lists key characteristics of a rural event.

Table 15-1
Types of Rural Events

EVENT TYPE
• Fairs and festivals in rural areas
• Events at a rural amphitheater
• Events at a rural race track venue
• Professional golf tournaments in rural areas

Table 15-2
Distinguishing Operating Characteristics of a Rural Event

CHARACTERISTIC
• Rural or rural/tourist area
• High attendance events attracting event patrons from a regional area
• Limited roadway capacity serving an event venue
• Area lacking regular transit service
• Events having either a time specific duration or continuous duration

Special Considerations

In light of the characteristics of a rural event, special considerations when planning such an event include:

- Need for stakeholders to assume new and/or expanded roles.
- Need to work closely with all affected stakeholders in order: (1) to gain their help in identifying concerns and (2) to introduce them to mitigation measures that they may be unfamiliar with due to the rural nature of the area.
- Need to work closely with involved stakeholders so that a trust relationship is established, thus lessening sensitive feelings of an outsider coming in and imposing initiatives that could overlook the significance of local issues.
- Existence of limited road capacity to access the event venue and potentially limited parking capacity at the venue.
- Existence of fewer alternate routes to accommodate event and background traffic.
- Lack of regular transit service and hotels near the venue.
- Existence of limited or no permanent infrastructure for monitoring and managing traffic.
- Generation of trips from a multi-county region.

EVENT OPERATIONS PLANNING 

The scope and infrequent/one-time occurrence of a high-attendance rural event, coupled with the typical limited capacity of transportation systems in rural areas, requires the event planning team to develop: (1) a feasibility study, (2) a traffic management plan, and (3) travel demand management initiatives (as necessary) in the event operations planning phase. The stakeholder composition of an event planning team var-

ies by event, as some rural events represent community or not-for-profit events while others involve commercial dealings. In regard to a community-sponsored special event, transportation and/or law enforcement agencies usually bear the responsibility of developing all of the necessary event planning phase products. Recurring rural events, such as an annual festival or auto race, permit stakeholders to reference a past feasibility study and traffic management plan, coupled with operations successes and lessons learned, when conducting advance planning activities for a future event. However, due to the significant time between recurring rural events, the event planning team must anticipate (1) changes in the operations characteristics of a future event, (2) modifications to the transportation system serving the event, and (3) changes in the community (e.g., land use, socioeconomic, regulations, etc.).

Figure 15-2 presents 31 steps in the event operations planning process for all planned special events. The flowchart covers development and integration of the phase's aforementioned three products. Table 15-3 complements the flowchart by providing step-by-step guidance on issues and recommended analyses for a rural event. The table also presents reference information contained in this handbook that is specific to rural events. While all of the major handbook topics under event operations planning apply to a rural event, Table 15-3 indicates agency example applications (e.g., via narratives or photos) within the context of this event category. In turn, practitioners can use example applications presented for a rural event to manage travel for other categories of planned special events.

The flowchart in Figure 15-2 represents a suggested order of event operations planning activities. However, as noted below, the event planning team can modify activities to create a dynamic and more effective planning process tailored to the scope of a specific planned special event:

- A jurisdiction planned special event permit process and requirements will scope, schedule, and direct event operations planning activities for rural events, particularly continuous events occurring in rural areas.
- Based on lessons learned from past special events at a particular permanent venue, stakeholders may program new infrastructure or adopt new policies (e.g., parking restrictions) early in the event operations planning process.
- Links between process steps are two-way as stakeholders evaluate alternative strategies and/or integrate traffic management plan components.
- The event planning team can develop different traffic management plan components concurrently.

The event operations planning process references information and concepts contained in the advance planning section of this handbook, and it directs the user to recommended guidelines, procedures, strategies, and resource applications for managing travel for a specific planned special event. When following the process, practitioners should review:

- Advance planning and travel management process and considerations provided in Chapters 11 and 12 depending on the type of rural event.
- Important advance planning considerations and external factors, summarized in Chapter 5, that influence planning activities. For instance, effective and rapid stakeholder review of event operations planning products requires: (1) an

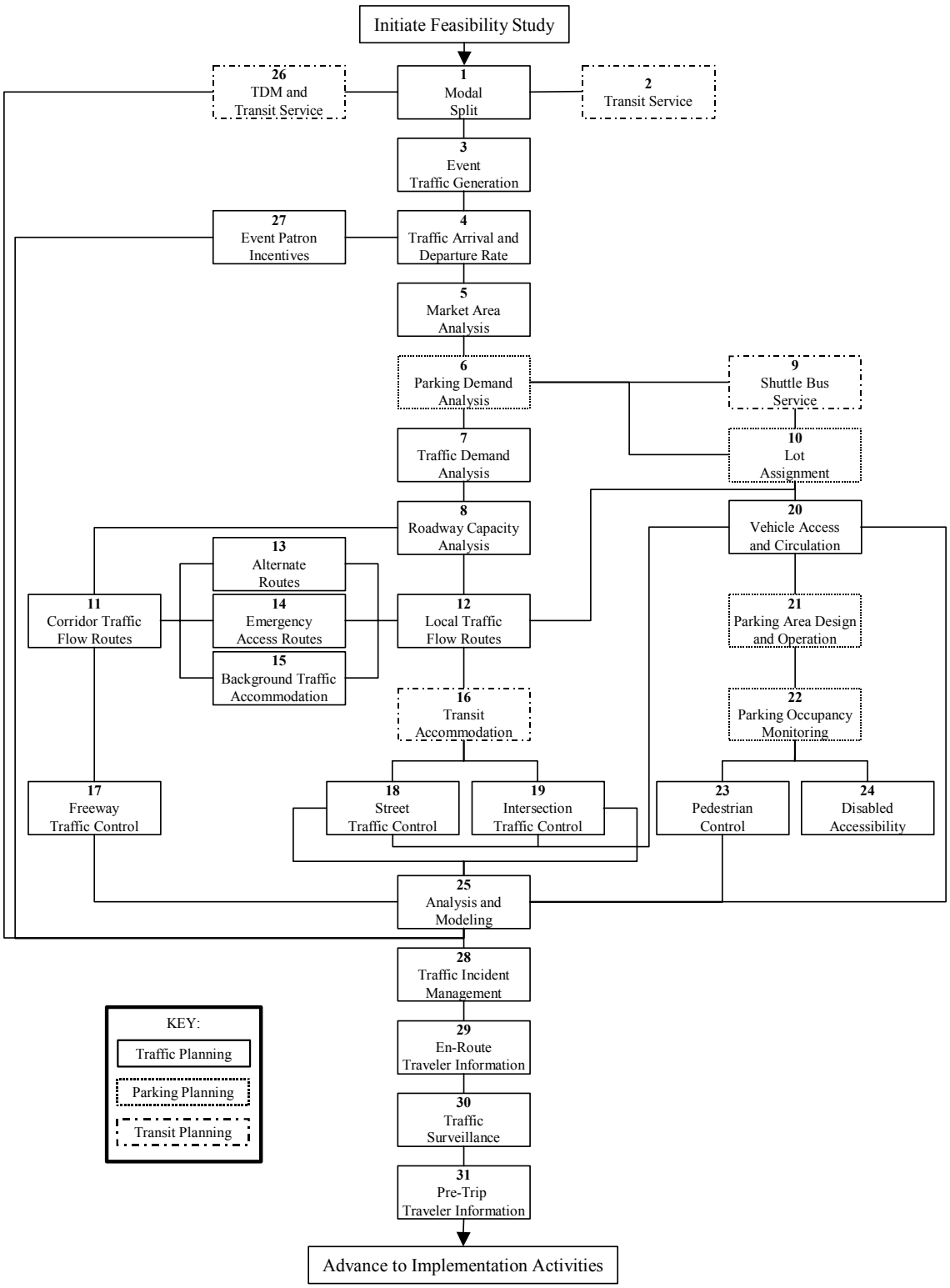

Figure 15-2
Event Operations Planning Process Flowchart

Table 15-3
Event Operations Planning Steps
Rural Event

STEP NO.	STEP PAGE	EVENT-SPECIFIC ISSUES	EVENT-SPECIFIC REFERENCE INFORMATION TOPIC	PAGE
1	5-20	• Consideration of 100% automobile trips.	• *Example:* Commuter rail service as alternative mode of travel; Figure 5-6.	5-20
2	7-9	• Public transit not existing or serving area surrounding the venue location.		
3	5-21	• Influence of seasonal population on attendance.		
4	5-22			
5	5-25	• Larger market area for high attendance events. • Origins of area visitors attending the event.		
6	5-27	• Use of off-site parking areas. • Likely use of unpaved parking areas.		
7	5-29			
8	5-30	• Detailed analysis of roadways providing access to event venue and parking areas.		
9	6-32		• *Example:* On-site shuttle bus station; Figure 6-28.	6-35
10	6-13	• Low capacity local traffic flow routes serving multiple parking areas.		
11	6-38			
12	6-38			
13	6-40			
14	6-41			
15	6-43	• Impact of high attendance events on background traffic flow.		
16	6-45		• *Example:* Exclusive bus route; Figure 6-36.	6-46
17	6-49		• *Special consideration:* Alternative lane operations for freeways.	6-54
			• *Example:* Portable changeable message sign; Figure 6-38.	6-50
			• *Example:* Appendix K – Equipment location plan.	6-59
18	6-51		• *Example:* Temporary reversible lane operation; Figure 6-1.	6-1
			• *Example:* Route marker signs; Figures 6-46 and 6-47.	6-55 and 6-56
			• *Example:* Appendix K – Equipment location plan.	6-59
19	6-57		• *Example:* Positive traffic control; Figure 6-54.	6-58
			• *Example:* Appendix K – Equipment location plan.	6-59
20	6-16	• Presence of few roadways providing access to venues and adjacent parking areas. • Consideration of strategies to increase the capacity of site access roads and parking area access points. • Potential for event patrons to park illegally on site access road shoulders.	• *Example:* Roadway shoulder utilization; Figure 6-9.	6-18
			• *Example:* Strategy for effecting parking area egress.	6-20
			• *Example:* Striping additional exit lanes on parking area access roads for egress; Figure 6-11.	6-20
21	6-20	• Likely use of unpaved parking areas.	• *Example:* Minimizing pedestrian/vehicular conflicts in parking areas; Figure 6-14.	6-23
22	6-23			
23	6-28	• Likely lack of sufficient existing pedestrian facilities within area surrounding the event site. • Emphasis on pedestrian safety.	• *Example:* Temporary pedestrian bridge; Figure 6-23.	6-31
24	6-32	• Strong consideration for temporary venues.		
25	6-9	• Consideration of detailed analysis (e.g., table-top exercises) and modeling for high attendance events.		

STEP		EVENT-SPECIFIC ISSUES	EVENT-SPECIFIC REFERENCE INFORMATION	
NO.	PAGE		TOPIC	PAGE
26	7-2 to 7-14	• High applicability of high occupancy vehicle incentives, local travel demand management, and charter bus service to this event category.		
27	7-6			
28	6-72	• Roadway network serving the event likely not lighted. • Consideration of quick clearance initiatives to avoid breakdown of critical traffic flow routes.	• *Example:* Portable lighting; Figure 6-58. • *Example:* Congestion warning sign; Figure 6-59.	6-73 6-73
29	6-61	• Emphasis on portable roadside traveler information devices.		
30	6-70	• Emphasis on portable closed-circuit television, field observation, and/or aerial observation.		
31	7-14	• Communication to a regional audience. • Event patrons likely unfamiliar with roadways and the transportation system serving the event.		

annotated planning timeline, (2) a review process, and (3) performance standards. Under risk assessment, scenarios relating to excessive overcrowding may warrant consideration if planning for a sporting or concert event.

- Traffic management plan components in Chapter 6 that provide an overview of various principles driving plan development in addition to a contingency plan checklist.

IMPLEMENTATION AND DAY-OF-EVENT ACTIVITIES

Implementation activities represent an essential phase in advance planning for rural events. The traffic management team may involve new interagency relationships, and it requires an event-specific implementation plan to communicate specifics of the new traffic management plan prepared by the event planning team. Stakeholder development of implementation plan details for an event at a permanent venue focuses on transportation operation successes and lessons learned for previous, similar events at the subject venue.

Because particular rural event types occur infrequently, stakeholder simulation exercises prove valuable in assisting traffic management team personnel understand the roles and responsibilities of participating stakeholders in addition to the actions taken on the day-of-event. Exercises must involve field staff, some of whom represent personnel obtained temporarily from other regions for the purpose of increasing local stakeholder (e.g., state police, etc.) staff for an event. Temporary staff, although possibly experienced in traffic control, usually do not have familiarity with the local transportation system or roadways in the vicinity of the venue site. Equipment testing marks another key consideration as day-of-event operations at and in the vicinity of the event site usually depend on portable equipment for traffic control, surveillance, and dissemination of en-route traveler information. These intensive stakeholder activities reflect the typical unfamiliarity with managing travel for a rural event coupled with the fact that transportation management activities, on the order required for a planned special event, may not regularly take place in the vicinity of the event site.

Table 15-4 presents a checklist of implementation and day-of-event activities for

Table 15-4
Checklist of Implementation and Day-of-Event Activities for Rural Events

HANDBOOK PAGE	ACTION	APPLIES ☑
8-2	• Develop an implementation plan.	☐
8-6	• Conduct a stakeholder simulation exercise(s).	☐
8-8	• Test equipment resources slated for use on the day-of-event.	☐
8-9	• Recruit and train volunteers to fulfill personnel resource needs.	☐
9-2	• Implement a traffic management team management process.	☐
9-4	• Designate a multi-agency command post.	☐
9-6	• Conduct a traffic management plan evaluation(s) during the day-of-event.	☐
9-6	• Establish protocol for traffic management team officials to consider and implement changes to the traffic management plan to accommodate real-time traffic conditions.	☐
9-8	• Establish interagency communication protocol.	☐
9-9	• Review communication equipment compatibility.	☐
9-10	• Use the media to communicate with event patrons and other transportation users.	☐
9-12	• Perform traffic monitoring on the day-of-event.	☐

stakeholders to consider regarding any rural event. As indicated in the table, the event planning team must determine, based on various event operations characteristics (e.g., event type, event location, event time of occurrence, attendance, market area, etc.) and other external factors, what unique set of activities apply in handling a specific special event. In addition, stakeholders should review the special considerations and recommended activities presented in Chapters 11 and 12 for discrete/recurring events at a permanent venue and continuous events, respectively, as appropriate based on the type of rural event. The table facilitates fast access to handbook sections providing detailed guidance, including recommended strategies, protocol, and resource applications, required by users to plan and execute these activities.

Some distinguishing considerations of this event category during the day-of-event activities phase include:

- The scope of high-attendance rural events demand personnel resources that may exceed the level of available staff from local event stakeholders. Supplementing traffic management team personnel with temporary staff and volunteers may represent a necessary action to meet staffing requirements for rural special events. Many volunteers have no past experience in tasks associated with traffic and pedestrian control and parking operations. As a result, volunteer training becomes paramount to the success of day-of-event operations. Chapter 8 contains checklists and relevant considerations for assessing personnel resource needs and using volunteers on the day-of-event. The chapter also specifies volunteer training activities and summarizes basic functions required of all volunteers.
- The traffic management team likely includes stakeholder representatives involved in managing travel for a particular rural event type for the first time. To

ensure successful traffic management plan deployment, the traffic management team must adopt a formal management process and establish an interagency communication structure and protocol to support day-of-event operations.

- Other essential team management considerations involve (1) the designation of an Incident Commander for the planned special event and (2) the set up of a temporary, multi-agency command post at or near the event venue.
- Traffic management team officials should anticipate enacting modifications to the traffic management plan during the rural event.
- Surveillance information and performance evaluation data define transportation operation conditions and, thus, influence decision-making at a day-of-event briefing. Given the typical lack of transportation management centers in rural areas, transportation system operators usually monitor system operations from the event command post using portable equipment (e.g., laptop computers, devices using radio/cellular/spread spectrum radio communication, etc.).
- The collection and evaluation of transportation system performance data proves valuable in guiding decision-making not only on the day-of-event but also for recurring rural events. Stakeholders can archive raw data for use in future feasibility studies, and various evaluation measures can identify specific areas that require improvement for future, similar events.
- The traffic management team must exercise great care in collecting performance evaluation data in order to ensure data quality and consistency.

POST-EVENT ACTIVITIES

All of the primary products of this phase (e.g., participant evaluation, post-event debriefing, and post-event report) have a high level of applicability to rural events. Given the infrequent occurrence of rural events coupled with the scarcity of travel forecast data, post-event activity results represent a key resource in planning for future rural events in a region.

Table 15-5 presents a checklist of post-event activities for rural events. The post-event activities section of this handbook provides detailed information on common techniques, special considerations, and recommended protocol that facilitate the activities listed in the table.

Table 15-5
Checklist of Post-Event Activities for Rural Events

HANDBOOK PAGE	ACTION	APPLIES ☑
10-2	• Review measures of effectiveness identified in event operations planning phase.	☐
10-3	• Compile agency measures of effectiveness.	☐
9-14	• Compile performance evaluation data.	☐
10-5	• Conduct stakeholder participant debriefing.	☐
10-6	• Conduct event patron survey.	☐
10-7	• Conduct public survey.	☐
10-7	• Conduct a post-event debriefing meeting.	☐
10-10	• Prepare a post-event report.	☐

Some distinguishing considerations of this event category during the post-event activities phase include:

- Practitioners should reference the post-event activities guidelines and considerations contained in Chapters 11 and 12, as appropriate, based on the type of rural event.
- In regard to participant evaluation, rural event patron travel surveys yield important information and statistics that can assist practitioners in (1) improving the accuracy of future rural event travel forecasts and (2) developing travel demand management incentives (e.g., express/charter bus services, event patron incentives) for the market area served by rural events.
- Periodic public surveys warrant consideration for special events under this category as event performance evaluation data fails to assess all community impacts. Survey results alert special event stakeholders of impacts to affected residents and businesses, in addition to non-attendee transportation system users, that may continue to occur with each successive special event at a particular venue location. As a result, stakeholders can develop and implement appropriate strategies (e.g., enforcement, etc.) and regulations to mitigate the identified impact(s) for future planned special events.
- Post-event debriefings represent a common and recommended stakeholder activity for all rural events.
    - Written comments should be obtained from temporary, borrowed staff used on the day-of-event if staff can not participate in a debriefing meeting.
    - A key aspect of a post-event debriefing for rural events involves preparing detailed meeting minutes that include the identification of key successes and lessons learned.
    - Considering the potential significant time between rural events, stakeholders must chronicle participant survey results and debriefing meetings so that those stakeholders charged with managing travel for future rural events can tap the wisdom of past participants.
- The occurrence of a major, recurring rural event warrants development of a post-event report. In turn, the report can serve as a working document to assist in advance planning for the next (year's) event.
- A post-event report for a recurring rural event should include an operational cost analysis to assist stakeholders in identifying potential cost-saving resource deployment strategies for the next event occurrence.

PROGRAM PLANNING

Program planning activities involve the development of policies, programs, and initiatives that facilitate improved planning and management of travel for future planned special events.

Program planning for rural events include activities, as summarized in Table 15-6, on both a regional and local level. Practitioners should reference program planning activities contained in Chapters 11 and 12, as appropriate, depending on the type of rural event.

Some distinguishing considerations of this event category during the program planning phase include:

Table 15-6
Program Planning Activities for Rural Events

PRODUCT	TOPIC	PAGE NO.
Institutional frameworks	• Development of a formal planned special event permit program.	4-10
	• Creation of a transportation operations task force for a recurring rural event or specific permanent venue.	5-3
	• Development of a joint operations policy.	5-15
	• Development of a mutual-aid agreement to facilitate resource sharing.	5-15
Policies and regulations	• Traffic and parking restrictions.	5-10
	• Public-private towing agreements.	5-16
	• Public information safety campaign.	6-73
	• High occupancy vehicle incentives.	7-3
Infrastructure deployment	• Planned alternate route for diverting background traffic around a venue.	6-40
	• Portable traffic management system.	6-56
	• Express, charter, or shuttle bus service.	6-32 7-11 7-12
	• Telephone information systems.	7-17

- The fixed location of planned special event venues (e.g., fairgrounds, amphitheaters, golf courses, and race tracks) in rural areas allow for the easy identification of stakeholder representatives involved in planning and day-of-event travel management for high-attendance special events at these venues. These representatives may collaborate year-round as an inter-jurisdictional, multi-discipline task force, working to: (1) strengthen interagency coordination for future special events, (2) identify needs relative to minimizing community impacts and improving transportation system operations during venue events. The latter involves proposing new policies, regulations, and infrastructure deployments to support future event-specific traffic management plans and travel demand management initiatives.
- A planned special event permit program proves particularly effective for rural events that, because of such characteristics as event attendance and event location, may (1) conflict with municipal or state guidelines and regulations and (2) impact transportation operations and the community. The program specifies a permit process, coupled with supporting restrictions and requirements, that allow stakeholders to plan and assess all types of rural events within a common framework. A section on program planning for local planned special events in Chapter 4 provides complete and in-depth coverage on developing a permit program applicable to rural events.
- Two or more stakeholders, representing multiple jurisdictions and/or disciplines, may establish a joint operations policy for managing travel for all planned special events in a region.
- Stakeholders may develop a mutual-aid agreement to facilitate resource sharing (e.g., personnel or equipment) and/or reimbursement for services in order to handle future planned special events.
- Because rural events usually occur infrequently and occasionally at temporary venues, an infrastructure needs assessment on the program planning level

should focus on equipment and technology applications transferable to managing all planned special events in a region and/or day-to-day transportation system operations.

- Funding represents a key public agency consideration for rural events in the program planning phase.
  - Commercial events may involve event organizers and participants from outside the community hosting the event.
  - Prior to initiating event operations planning activities for a specific rural event, stakeholders should establish a funding mechanism for recovering costs incurred in providing services during the event operations planning phase and resources on the day-of-event.
  - Funding often represents a requirement of a comprehensive planned special event permit program.

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APPENDIX A
SAMPLE SPECIAL EVENT PERMIT
REGULATIONS, APPLICATIONS, AND AGREEMENTS

SAN DIEGO, CA: SPECIAL EVENT REGULATIONS ON MITIGATING PUBLIC IMPACTS

MITIGATION OF IMPACT

As an event organizer, you are required to develop mitigating measures to accommodate the negative impact your event may have on entities that may be affected by your activities. Most neighborhoods and business districts are represented by a number of community groups that are officially recognized by the City of San Diego. These groups include, Community Planning Groups, Town Councils, Business Improvement Districts, and Recreation Councils. If your event venue is in an area that is governed by one or more of these groups, ***you must present your event concept to these organizations for their support or endorsement.*** You must also meet with the residents, businesses, places of worship and schools that may be impacted by the noise and street closures related to your event.

The City of San Diego requires that notices be mailed or hand delivered ***two weeks prior to your event*** to all entities impacted by event activities. Information in this notice should include, but not be limited to, the date(s), day(s), time(s), location(s) and types of activities taking place during your event. The notice must also give detour or alternate route information if regular access is affected or if transportation systems are impacted. The notice also must include a telephone number where members of the public can contact your organization if they have concerns or issues that need to be addressed.

The City of San Diego will also require you to provide advisory signs placed a minimum of two weeks prior to your event if the event impacts a major use roadway. Advisory signs are intended to provide advanced notice to the regular users of a roadway of the scheduled closure.

CHAPTER 7
SPECIAL HIGHWAY USE

7.1 BICYCLING, RUNNING, WALKING, FESTIVAL, AND PARADE EVENTS

RCW 46.61 prescribes the rights and duties for bicycle and pedestrian travel an highways, county roads, and city streets, With regard to bicycle or pedestrian events, traffic control considerations are essential to minimize potential traffic hazards.

Requests to use state highways for bicycle, running, and walking related events require written approval from the district to the event sponsor for events occurring within a district. Headquarters coordinates the required activities for multi-district events, responding to the involved districts and the State Patrol. Approvals may be granted after consideration and documentation of the following guidelines:

A. Event sponsors should be encouraged to use county roads or city streets if at all possible.

B. Where use of a highway without access control is necessary, there should be a detour route available. The detour should be satisfactory for through traffic and appropriately signed by the local jurisdiction(s). Request for state highway use within incorporated areas should receive concurrence from the affected city or town.

C. Sponsor developed traffic control plans must adequately and safely accommodate anticipated traffic conditions. Such plans must be approved by the district traffic engineer. All traffic control devices shall conform to the *Manual on Uniform Traffic Control Devices* (MUTCD).

D. The organizers, or sponsors, will prepay all extraordinary costs for labor and materials provided by the Department of Transportation.

E. The party requesting the state highway use shall notify, at least 48 hours (preferably seven days) in advance of the event, all local fire, ambulance, transit, law enforcement departments, and other service oriented activities that could be affected by the event.

F. The department must be included as an additional insured when highway authorities are not specifically named within event insurance policies.

Department regulations and policies do not allow bicycling, running, or walking related events on limited access highways except when prior approval is granted at locations where no alternate route exists. On an event basis, written approval by the State Operations and Maintenance Engineer is required.

Where a limited access highway has been approved for use, sufficient lane(s) are to be left open in each direction to allow expected volumes of traffic to operate without serious congestion. Appropriate traffic control plans and devices are to be used to enhance safety and to warn event participants and vehicle drivers of each others presence.

Public information efforts should be commensurate with the anticipated traffic impacts. The news media should be encouraged to publicize the event and possible congestion. This can be accomplished by imposing special requirements for public information on the sponsor, by news releases or media contacts by WSDOT personnel, or a combination.

Provide informational copies of correspondence related to such events to the State Traffic Engineer. When these events may affect ferry operations, contact the Marine Transportation Division.

OUTDOOR EVENT AND ENTERTAINMENT APPLICATION

VIRGINIA BEACH

CONVENTION AND VISITOR DEVELOPMENT
Resort Management/Special Events and Film Office (SEAFO)
2101 Parks Avenue, Suite 502
Virginia Beach, VA 23451
(757) 437-4800

OFFICE USE ONLY	Application Number: _____ Event Supervisor: _____
	Insurance: ❑ Rec'vd ❑ City Purchased? Fee Paid: ❑ Yes ❑ No

The information requested by the Special Events Application form will be used to determine your eligibility for the permit requested. Completed forms may be released upon the request of any citizen, as provided by the Freedom of Information Act. Completion of the form is voluntary, however, failure to do so will prevent processing of your application.

Any misrepresentation in this application or deviation from the final permit conditions may result in immediate revocation of the permit, the halting of the event, and possible loss of privilege to host events in the future.

Please answer all questions, indicate N/A if the question does not apply to your event.

PERMIT PROCESSING:

Event	Application Submittal / Processing Time	Processing Fee Checks made payable to the City Treasurer
Party on Private Property, Block Party, Non-Commercial Carnival	30 days prior to the event	$50.00
Outdoor Entertainment (Seasonal)	60 days prior to the event	$100.00
Outdoor Entertainment / 2 or more days	60-90 days prior to the event	$150.00
Parade / Major Thoroughfare	60-90 days prior to the event	$100.00
Parade / Residential Streets, One Day Event, Commercial Carnival	30-60 days prior to the event	$75.00

APPLICANT AND ORGANIZATION INFORMATION

Applicant's Name: _____

Are you 18 years of age or older? ❑ Yes ❑ No Are you representing yourself? ❑ Yes ❑ No

Are you representing an organization? ❑ Yes ❑ No Is it a non-profit organization with 501(c)(3) status? ❑ Yes ❑ No

(Attach a copy of the 501(c)(3) certificate or note the identification number) _____

Organization's Name: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

Day Phone: _____ Evening Phone: _____

Fax Number: _____ On-Site Cellular: _____

Pager: _____ E-mail: _____

ABOUT THE EVENT AND ENTERTAINMENT

Please check all that apply. This event is a...

❑ *Parade / Run / Walk / Bike or Auto Procession ❑ Block Party ❑ **Carnival ❑ Tent Revival

❑ Festival ❑ Concert ❑ Beach / Ocean Event ❑ Sporting Event ❑ Private Party

❑ Other: Please explain: _____

The event is... ❑ Private (by invitation only) ❑ Open to the General Public

The event will be hosted on... ❑ Private Property ❑ Commercial ❑ Residential ❑ Public Property

Event Name: _____

Location(s): _____

(Please attach Site Map)

Event Date:	Setup Time:	Start Time:	End Time:	Breakdown Time:

Rain Date(s) / Times: _____

Please note the range of total anticipated attendees (including spectators and participants):

❑ 0 - 150 ❑ 150 - 500 ❑ 500 - 1000 ❑ 1000 - 5000 ❑ 5000+

Please indicate how many times this event has been hosted before.

❑ 1st time ❑ 2 - 4 times ❑ 5+ times Where? _____

EVENT-AT-A-GLANCE PLEASE INDICATE THE VARIOUS EVENT ACTIVITIES. CHECK ALL THAT APPLY.

❑ Alcohol ❑ Bleachers ❑ Petting Zoo ❑ Staging
❑ Banners / Signs ❑ Food Vending / Sampling ❑ Shuttles / Satellite Parking ❑ Public Address System
❑ Boats ❑ Live Music / Band ❑ Tents
❑ Beach Activity ❑ Mechanical Rides / Devices ❑ Vendors (non-food / beverage)

***Parade / Run / Walk / Bike or Auto Procession**

Assemble area / time: _____
Disassembly (finish) area: _____ Time: _____
Describe parade route (attach a map of the entire route and highlight streets) _____
_____
_____

Number of marching units: _____ Number of non-marching units: _____
Number of floats (specify height, length, etc.): _____
Types of vehicles: _____ Cars _____ Motorcycles _____ Pickup trucks _____ Semi trucks _____ Other
Types of animals: _____ Horses _____ Dogs _____ Other
Will you need special arrangements for dignitaries? ❑ Yes ❑ No
Will you have a reviewing stand? ❑ Yes ❑ No Where will it be placed? _____

****Carnival or Petting Zoo:**

How many mechanical rides or other amusement devices such as a moonwalk will be used? _____
What types: _____
Amusement company's name: _____
Address: _____ Phone: _____ Fax: _____
Company's representative: _____ Phone: _____ Fax: _____

FOOD, NON-FOOD, AND OTHER VENDOR INFORMATION**

A vendor is anyone who is serving, selling or sampling food, beverages, or merchandise.

FOOD: Please check all that apply

Food will be... ❑ Served ❑ Sold ❑ Catered ❑ Prepared in Church Kitchen
❑ Prepared Outdoors ❑ Delivered from another location ❑ Prepared in School Cafeteria

Food Date(s): _____ Times: _____
_____ _____
_____ _____

Time food vendor setup ready for inspections: _____
**Please fill out attached vendor information sheet (one for each vendor).

NON-FOOD:

A separate Vendor Information Sheet (attached) shall be completed for each vendor participating in the event.

ALCOHOL:

Alcohol information must be completed regardless of whether the event is public or private. Please answer all questions that apply:

Type: ❑ Draft Beer ❑ Canned Beer ❑ Wine ❑ Liquor Will be: ❑ Sold ❑ Served
Date(s): _____ Times: _____
_____ _____
_____ _____
_____ _____

STRUCTURES, TENTS, BLEACHERS AND STAGES

TENTS: Please give an overview of your tent plan. List type (by Code), number, and size(s) of tents to be erected.
Tent Codes: **C** - Cooking underneath **GA** - General assembly (requires floor plan showing exits) **S** - Sales of food, products, etc.

Tent Code	Number of Tents	Sizes

BLEACHERS: If your event will have bleachers, please provide the type of bleacher, size, and supplier.

Size	Supplier	Phone Number

STAGES:

Size	Supplier	Phone Number

SECURITY: Security is required when -

- alcohol is being served / sold,
- materials / equipment is left overnight,
- live entertainment is provided.

Please describe your security plan: _____
Describe type of equipment left overnight: _____
Uniformed presence provided by: ❑ Off-duty Police Officers ❑ Private Security ❑ Volunteers ❑ Hired Staff ❑ Sheriff's Deputies
When: _____ How many? _____

RESTROOMS AND WASTE DISPOSAL

Please note number of trash receptacles you will require. ❑ 5 - 10 ❑ 10 - 20 ❑ _____
Have you contracted with a portable restroom company? ❑ Yes ❑ No
If "yes," please provide the company name and an after hours / emergency phone number.
_____
Delivery date of portable restrooms: _____ Pick-up date: _____
Please list the number and locations of portable restrooms:

Number	Location

BANNERS AND SIGNS

Please provide us with an overview of your banner and sign plan. List number, location, and type of banners.
Location of banner codes: **ES** - Within event site **LP** - On street light poles **BWR** - Boardwalk railing
Type of banner codes: **DI** - Directional / Informational **SP** - Sponsorship **OT** - Other

Number of Banners / Signs	Location Code	Type Code	Comment

PARKING AND TRANSPORTATION

How will people get to / from event?
❑ Personal Vehicles
❑ Shuttle / Satellite Parking
❑ Other: Please explain:_____
_____

Where will the event attendees / participants park?
❑ On-Street / Public Parking ❑ School Grounds
❑ Reserved / VIP Parking ❑ Church Grounds
❑ Satellite Parking Location: _____
❑ Other: Please explain:_____

Do you require special parking? (VIP, RVs, trailers, support vehicles) ❑ Yes ❑ No

Number of Spaces	Location	Purpose

**Due to limited parking in the resort area all parking requests may not be granted. Applicant shall contact SEAFO two (2) weeks prior to the event to request parking passes for support vehicles in designated areas in / near the event site.

MEDICAL Describe in detail your medical plan:

_____

AMERICANS WITH DISABILITIES ACT

Some events must comply with ADA requirements. Please indicate which of the following you will have at your event. Please check all that apply.

❑ Ramps / walkways on the beach ❑ Sign-language translator ❑ Hearing-impaired listening devices
❑ Designated wheelchair viewing areas ❑ Handicapped-accessible restrooms ❑ Handicapped-accessible shuttles

OTHER PERMITS

In addition to an Outdoor Event and Entertainment permit, other City, State, and private agencies may require a permit relative to your event. Please indicate if you have applied for a permit or will be applying for a permit from each agency. Please use the following codes: **HA** - Have Applied **WA** - Will Apply **DNA** - Does Not Apply to This Event

Code Department /Agency

_____ ASCAP / BMI (playing of music)
_____ Health Department (food concessions, food sampling, etc.)
_____ Fire Department (fireworks, pyrotechnics, special effects)
_____ Commissioner of the Revenue (business license, sporting tax, admission tax, prepared F&B, etc.)
_____ State Department of Taxation (sales tax)
_____ U.S. Coast Guard (federally regulated waters)
_____ ABC Board (alcoholic beverages)
_____ Planning / Permits and Inspections (tents, bleachers, amusement devices, etc.)

EVENT BOUNDARIES (Resort Events Only)

Please define the boundaries of your event:

North: _____ South: _____
East: _____ West: _____

TELECOMMUNICATIONS (Resort Events Only)

Please indicate if your event has the following needs. Please note number and location on your site map.

❑ T1 lines. Number and location: _____
❑ Regular phone lines. Number and location: _____
❑ Other: _____ Number and location: _____

ON-SITE COMMUNICATIONS (During Event)

Cellular Phone #1 Day of Event: _____ Will you use radio communications? ❑ Yes ❑ No
Cellular Phone #2 Day of Event: _____ Radio provided to SEAFO staff? ❑ Yes ❑ No

HOLD HARMLESS CLAUSE:

Permittee (applicant / organization) shall assume all risks incident to or in connection with the permitted activity and shall be solely responsible for damage or injury, of whatever kind or nature, to person or property, directly or indirectly arising out of or in connection with the permitted activity or the conduct of permittee's operation. Permittee hereby expressly agrees to defend and save the City, its officers, agents, employees, and representatives harmless from any penalties for violation of any law, ordinance, or regulation affecting its activity and from any and all claims, suits, losses, damages or injuries directly or indirectly arising out of or in connection with the permitted activities or conduct of its operation or resulting from the negligence or intentional acts or omissions of permittee or its officers, agents, and employees.

_____
Applicant's Name (Printed Neatly)

_____ _____
Applicant's Signature Date

EVANSTON, IL: SPECIAL EVENT HOLD HARMLESS AGREEMENT

Hold Harmless/Indemnification Agreement

_____ has requested permission to _____ in the City of Evanston. For consideration of such permission, _____ hereby fully releases and discharges the City of Evanston, its officers, agents and employees from any and all claims from injuries, including death, damages or loss, which may arise or which any be alleged to have arisen out of, or in connection with the event.

_____ further agrees to indemnify and hold harmless and defend the City of Evanston, its officers, agents and employees from any and all claims resulting from injuries, including death, damages or losses, including, but not limited to the general public, which may arise or which may be alleged to have arisen out of, or in connection with this event.

In addition, _____ shall furnish two copies of certificates of insurance with the City of Evanston named as an additional insured in the amount of $1,000,000 unless a greater amount is warranted.

_____
Company

_____
Name

_____
Title

_____
Signature

Applicant's Statement of Agreement:
I hereby affirm that the above information is true and correct in describing the intent of this application.
I, _____, the undersigned, agree to abide by the provisions in this application and the instructions attached hereto.

_____ _____
(Signature of Applicant) (Date)

SPECIAL REQUIREMENTS FOR USE OF WHITTINGTON AVENUE *CHECKLIST*

The following checklist applies to any special event permit issued for the use of Whittington Avenue from its intersection with Ozark and Water Streets west to Woodfin Street. A complete description of these requirements is attached to Ordinance Nos. 4458 and 4556. Event Sponsor must comply with the requirements as stated in Ordinance Nos. 4458 and 4556 and their attachments. In this regard, the *Sponsor must*:

- ☐ Provide written notification to area residents as illustrated in Exhibit 1 to Ordinance No. 4458 not less than 3 nor more than 10 days prior to the event.
- ☐ Provide "escort passes" for residents on the boulevard section of Whittington and to the residents of Quartz Street prior to event.
- ☐ Arrange with a local ambulance service for the provision of an ambulance to be stationed in the Whittington area during the event.
- ☐ Contact the City's Engineering Office (Municipal Building, 133 Convention Blvd., 321-6860) and arrange for pickup of required signs. (A refundable deposit of $20.00 per sign must be paid at the time the Sponsor picks up the signs.)
- ☐ Install temporary signs at: (1) Park Ave. & Gulpha Gorge Rd., (2) Blacksnake Road at Bull Bayou, (3) Prospect at West Mountain Drive, and (4) east and west ends of the Whittington boulevard section.
- ☐ Install detour signs as indicated by Exhibit 3 to Ordinance No. 4458.
- ☐ Install barricades at the intersection of Whittington and Woodfin as indicated by Exhibit 3 of Ordinance No. 4458.
- ☐ Provide radio equipped marshals at all intersections along Whittington (12 minimum).
- ☐ Arrange to reopen Whittington between events, if applicable.
- ☐ Ensure that one lane of traffic on Whittington Avenue remains open at all times in the designated event area (from Ozark and Water Streets west to Woodfin).
- ☐ Any special event expected to last for a duration of two hours or more shall require the sponsor to place on each end of Whittington Park one male and one female port-a-potty.
- ☐ Remove and return all city owned signs to the City's Engineering Office (Municipal Building, 133 Convention Blvd.) within two days after the event.
- ☐ Event sponsors are responsible for providing all necessary barricades and traffic cones. (Available from rental and/or construction companies.)

PUBLIC RIGHT-OF-WAY PERMIT
SPECIAL REQUIREMENTS:
(check all applicable boxes)

☐ (1) Signs notifying the public **must** be posted a minimum of one week prior to the event on the right side of all effected roadways where they intersect with major roadways. (see illustration "A" for sign details).

When applicable, "ROAD CLOSED" signs **must** be posted the day of the closure at the last **major** intersection where motorists can detour to avoid the closure (see illustration "D") and at the actual point of the closure (see illustration "C").

Lettering and symbols on the above described signs **must** be legible for passing motorists to easily see and comprehend.

☐ (2) Temporary parking restriction signs **must** be posted 72 hours in advance and remain posted for the duration of the event at locations where parked vehicles would conflict with the event.

See illustration "B" for the required sign message and dimensions. Lettering and symbols **must** be legible enough to be easily seen and comprehended.

☐ (3) Traffic drums or cones (see illustration "E" and "F") **must** be used at all points of closure — starting areas, the crossing of intersections, locations where the route changes directions, and all driveways (except single family homes).

☐ (4) For the closure of a lane or a portion of a lane along a segment of roadway, the permittee **must** provide 28" high traffic cones or traffic drums placed no further than 40' apart to separate and define the portion of the roadway to be used for vehicle travel from that reserved for the event.

☐ (5) Traffic drums or cones **must** be in place just prior to the times allocated for the event (as specified herein) and removed as soon as the last participant clears each section of the event route (no later than the ending time as stated on the permit).

☐ (6) For races or moving events, a "LEAD and "CHASE" vehicles **must** be used in front and behind to insure the safety of all participants during the event.

☐ (7) Residents and/or businesses of all properties fronting the subject road sections and/or those whose access is directly impacted by the event **must** be notified in writing by the permittee a minimum of 72 hours prior to the event.

☐ (8) Vehicle access to and from properties abutting and/or directly affected by the event **must** be permitted at all times: **EMERGENCY VEHICLES SHALL BE PERMITTED THROUGH PASSAGE AT ALL TIMES**.

☐ (9) Permittee **must** secure police assistance at locations that require complete closure of the roadway and at all signalized and/or major intersections where the participants may be crossing without regard to existing traffic control devices.

☐ (10) Competent adult monitors **must** be stationed at all other intersecting roadways and/or driveways (except those of signal family homes) not controlled by police.

☐ (11) Competent adult monitors **must** have copies of "Detour Maps" to inform passing motorist of alternate routes around the event.

☐ (12) If applicable, permittee **must** secure the necessary permits from Maryland State Highway Administration and/or other agencies or municipalities for the temporary use of their right-of-way.

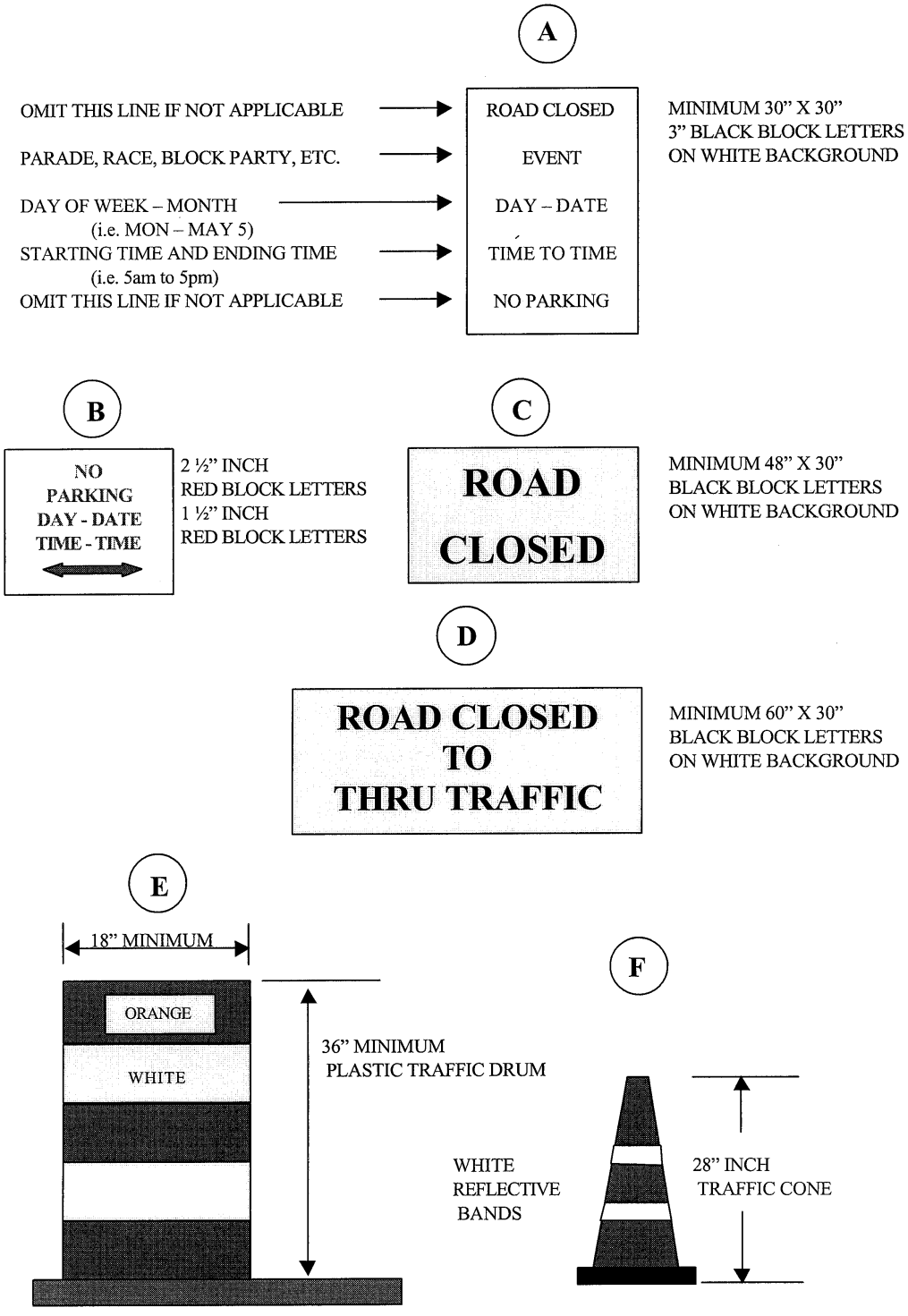
☐ (13) The "Double Yellow Center Line" rule **shall** be enforced at all times during the race. This rule also applies to any practice runs the participants partake in prior to the race.

"The Double Yellow Center Line Rule prohibits any participant from crossing the center line of any roadway during practice or the actual race with the exception of the start of the race and the sprint to the finish line at the end of the race".

☐ (14) A "Rolling Road Block" type of closure **shall** be used during the event. At no time will any county roadways be closed to motorists during the event, except during the start of the race and the finish of the race.

☐ (15) "Practice Runs" are allowed only on the roadways as stated in the permit and **must** be held on the day of the event and only during the times as stated in the permit.

APPROVED:_____ **DATE:**_____
TRAFFIC CONTROL AND LIGHTING ENGINEERING


A
OMIT THIS LINE IF NOT APPLICABLE
PARADE, RACE, BLOCK PARTY, ETC.
DAY OF WEEK – MONTH
(i.e. MON – MAY 5)
STARTING TIME AND ENDING TIME
(i.e. 5am to 5pm)
OMIT THIS LINE IF NOT APPLICABLE
ROAD CLOSED
EVENT
DAY – DATE
TIME TO TIME
NO PARKING
MINIMUM 30" X 30"
3" BLACK BLOCK LETTERS
ON WHITE BACKGROUND
B
NO
PARKING
DAY - DATE
TIME - TIME
2 ½" INCH
RED BLOCK LETTERS
1 ½" INCH
RED BLOCK LETTERS
C
ROAD
CLOSED
MINIMUM 48" X 30"
BLACK BLOCK LETTERS
ON WHITE BACKGROUND
D
ROAD CLOSED
TO
THRU TRAFFIC
MINIMUM 60" X 30"
BLACK BLOCK LETTERS
ON WHITE BACKGROUND
E
18" MINIMUM
ORANGE
WHITE
36" MINIMUM
PLASTIC TRAFFIC DRUM
F
WHITE
REFLECTIVE
BANDS
28" INCH
TRAFFIC CONE

MARCO ISLAND, FL: SPECIAL EVENT DIRECTIONAL SIGN REGULATIONS

DIRECTIONAL SIGNS IN ROW:
Directional signs located within the right-of-way must be a minimum of 18" x 24" and a maximum of 24" x 32". It is recommended that the signs be blue with white lettering. The signs shall be professional in appearance and shall include the special event permit number (can be placed on back of sign). Signs may not be erected prior to 7 days before the scheduled event and must be removed with 24 hours of the completion of the event. Signs may not be located within medians, attached to traffic control signs or other authorized highway signs. Signs shall be located a minimum distance of 30 feet from street intersection and a minimum distance of 6 feet from the edge of pavement or 3 feet from the back of a curb. The bottom of all signs shall be a minimum of 12 inches above existing ground and the top of the sign shall not exceed a distance of 5 feet above the existing ground.

WALWORTH COUNTY, WI: COUNTY CODE SECTION 10-28
RECOVERY OF EXPENSES INCURRED FOR PROVIDING EXTRAORDINARY GOVERNMENTAL SERVICES

Extraordinary services means reasonable and necessary services provided by the County above and beyond its normal capabilities and requirements of providing for public health and safety that cause a measurable burden upon the County. Such services shall include extra police protection, traffic control or refuse collections and the administration of this Ordinance.

Sec. 10-28. Recovery of expenses incurred for providing extraordinary governmental services.

(a) As a condition of any license granted hereunder, the licensee shall be responsible for reimbursing the County for the cost of providing extraordinary governmental services required as a result of the licensed event as provided in this section.

(b) There shall be a charge for each ticket sold, as shall be determined, from time to time, by the Executive Committee, which charge shall be collected by the licensee and forwarded to the County within 30 days after each event. The licensee shall provide the County with complete ticket manifests for each event, and grant to the county the right to audit attendance figures for each event within one (1) year following the date of the event.

APPENDIX B
EVENT-ORIENTED RISK SCENARIO CONTINGENCY PLANS

NEW JERSEY DOT CONTINGENCY ALTERNATE ROUTE PLAN FOR THE 2000 REPUBLICAN NATIONAL CONVENTION

Diversion Routing Plan for Route 30 and I-676 Republican National Convention 7/30/00

Due to the Republican National Convention and the high probability of road closures on 7/30/00, NJDOT will be placing approximately 15 variable message signs in the Camden County area. The signs will be used to direct delegates, buses and other interested parties to the Camden Water front. In the event of a closure these signs will be changed to direct traffic to pre-planned diversions. Outlined below are the three scenarios NJDOT is prepared to support.

Scenario No. 1 All roads and bridges open:

VMS located throughout Camden County will direct the traveling public to exit 5A on I-676 northbound or the Mickle Boulevard exit of Route 30 west bound for all RNC sponsored events.

Scenario No. 2 Ben Franklin Bridge Closure: Task Force 1

NJDOT safety crew (425) along with NJSP trooper support, will close I-676 NB and force all traffic off at the Atlantic Avenue (Exit No. 4). Once on the ramp all traffic will be directed to the left (west) and will either go straight for the RNC events or make a left and back onto I-676SB. VMS on I-676 and Atlantic Avenue will be utilized to assist in directing motorists. Additional VMS located on the Atlantic City Expressway, Route 42, and I-295 will also be advising motorists of the bridge closure. Detour signs will be placed along Atlantic Avenue at the intersection of Broadway and 2nd Street. NJDOT's traffic operation center (TOC) will be in close communication with the traffic services advising them of the closure.

The second crew (415) will close Route 30 west bound at the Mickle Boulevard Exit and force all traffic onto Flanders Avenue. At the gore area below the ramp all traffic will be directed either left for the RNC events, or right onto 10th Street to Federal Street and back onto Route 30 eastbound. VMS and detour signs will be utilized to assist in directing traffic. Additional VMS located on Routes 38, 70, and 130, and a Highway Advisory Radio will also be advising motorists of the bridge closure.

Manual control cords will be installed on the traffic signals located on Atlantic Avenue at the base of I-676. NJSP will have dismounted posts at these signals.

Other Agency Support:

NJSP Troopers will cover two traffic signals on Atlantic Avenue, at the base of I-676.

Atlantic City Expressway needs to place 2 VMS towards the western end of the Expressway.

ALPINE VALLEY MUSIC THEATRE (WI) TRAVEL DEMAND MANAGEMENT STRATEGY FOR THE GRATEFUL DEAD – TERRAPIN STATION MUSIC FESTIVAL

YOUR QUESTIONS ANSWERED!
TERRAPIN STATION Q&A

(East Troy – July 26, 2002)) Greetings from Alpine Valley! We are only a week away from one of the most anticipated concerts in our legendary history, Terrapin Station August 3 and 4. As preparation for this incredible event continues, we at Alpine would like to answer some very important questions from the fans. A great deal of this information is being released for the first time today, so please read carefully.

I don't have a ticket. How can I be part of this event?
Well, the first thing to do if you don't have a ticket is enjoy the show from somewhere other than Alpine Valley. As we know, the Grateful Dead folks have been very firm in reminding everyone not to come to the show without a ticket. You've seen letters from the band, you've heard announcements on the radio, and, if you were at one of numerous concerts around the country in the last two weeks, you were personally handed a flyer reiterating that message.
Given that very clear message from the band not to come to Alpine without a ticket, we have worked hard to find to ways for those without tickets to enjoy the show either by themselves or with friends and family.

How strict are the ticket checkpoints going to be at the show?
Every person will be required to have a ticket for that evening's show. Make sure everyone has his or her tickets before you leave for the theatre! The checkpoints will begin as you exit the interstate or approach the facility on the county road system. The right front seat passenger should have all the tickets and be ready to show them at various checkpoints on the way to the parking lot. Upon reaching the parking lot, the car will be stopped and the tickets will be validated. At this point any vehicle that does not have a ticket for each person in the car will be refused entry. Cars that comply will be issued a parking pass and allowed to enter the lots.
This process will be as mellow as we (and you!) can possibly make it. Nobody will be hassled and everybody will be treated courteously and respectfully. However, a large staff of Alpine Valley employees backed up by the county police will be checking each and every ticket very carefully.

What happens if someone in my vehicle decides to get out and walk into the facility?
No pedestrians will be allowed admittance. Spotters will be on the road to identify vehicles that have allowed individuals to get out and become pedestrians. When such a vehicle reaches the final checkpoint, it will be turned away and possibly ticketed.

Won't all of these measures slow traffic to a crawl?
We understand that traffic may be moving a bit slower that a typical show, but given the enormous staff that will be used for ticket verification, our expectation is that the delays will be minimal.

My friends and I will be arriving by bus. Who should hold our tickets and what do we do?
All buses and limousines will be directed to enter the facility via a special route identified by the police. Once the bus or limo has entered, a staff member will come to the vehicle and validate each ticket. If you are on a bus or in a limo, please hold onto your individual tickets. Anyone not having a valid ticket for that performance will be required to stay in the vehicle. If the vehicle has numerous people in it without tickets, the entire bus including fans with tickets may be refused entry to the property. Please make sure that everyone has there ticket prior to getting on the bus and the process should be a very simple once you arrived at Alpine.

The band recently said that additional shows would be added prior to the Alpine Show playing. Are these shows happening?
The band has announced, on a conditional basis, a tour for this fall. They have also stated very clearly that these dates will only play if all goes well at Alpine Valley. Basically, if Terrapin Station at Alpine Valley goes well, then The Other Ones will be able to take their magic around the country once again, bringing music and happiness to thousands of people. If it doesn't, they won't. Simple as that.

APPENDIX C
INTERAGENCY AGREEMENTS FOR SPECIAL EVENT PLANNING

ILLINOIS DOT AND ILLINOIS STATE POLICE
JOINT OPERATIONAL POLICY STATEMENT ON TRAFFIC SYSTEMS MANAGEMENT

ILLINOIS DEPARTMENT OF TRANSPORTATION

AND

ILLINOIS STATE POLICE

Joint Operational Policy Statement

Annex G: Traffic Systems Management

DEFINITION

Traffic Systems Management: Illinois Department of Transportation (IDOT) and Illinois State Police (ISP) share a mutual role in planning, organizing, implementing and controlling the movements of vehicular traffic using Illinois highways. The spectrum of Traffic Systems Management actions include improved safe vehicle flow, reduced peak period travel, preferential treatment of high occupancy vehicles, parking management, and transit system improvements.

OBJECTIVES

1. Maintain a close working relationship between agencies to ensure a continuing information flow on the various Traffic Systems Management elements. This requires a regular dialog at operational levels between IDOT and ISP Districts to exchange ideas and suggestions based on field experience. Past expressway projects in Chicago reflect the value of a close working relationship with ample opportunity to communicate. Special techniques must be developed for handling construction-impacted traffic by both the enforcement and highway agencies based on a mutual concern for safe traffic movement.

2. Mutually develop inter-agency traffic management teams to preplan responses and procedures for handling all major traffic incidents, events and activities.

3. Plan for accident investigation sites and procedures to reduce impacts of law enforcement reconstruction on traffic flow.

4. Concentrate on efforts making Illinois Department of Transportation and Illinois State Police personnel "traffic sensitive" to the consequences of their actions in incident management, work zone establishment, vehicle relocation/removal, and truck incident handling. When problems arise, appropriate IDOT personnel should contract the appropriate ISP command officer.

5. Establish clear communications lines between agencies for mutual notification of accidents and/or incidents.

6. Provide agency linkages for electronic traffic information exchange by use of computers, television, telephones and other means to assist multi-agency operations as well as public information dissemination.

7. Meet regularly to establish operational policies, incident management techniques, and plan major highway improvement project impact assessments as well as congestion investigation measures.

8. Encourage attendance at training seminars, enforcement/engineering conferences and provide other educational opportunities to increase Traffic Systems Management knowledge and provide for engineering and enforcement viewpoint interchange.

9. Explore all funding opportunities to support enforcement on the highway patrol efforts.

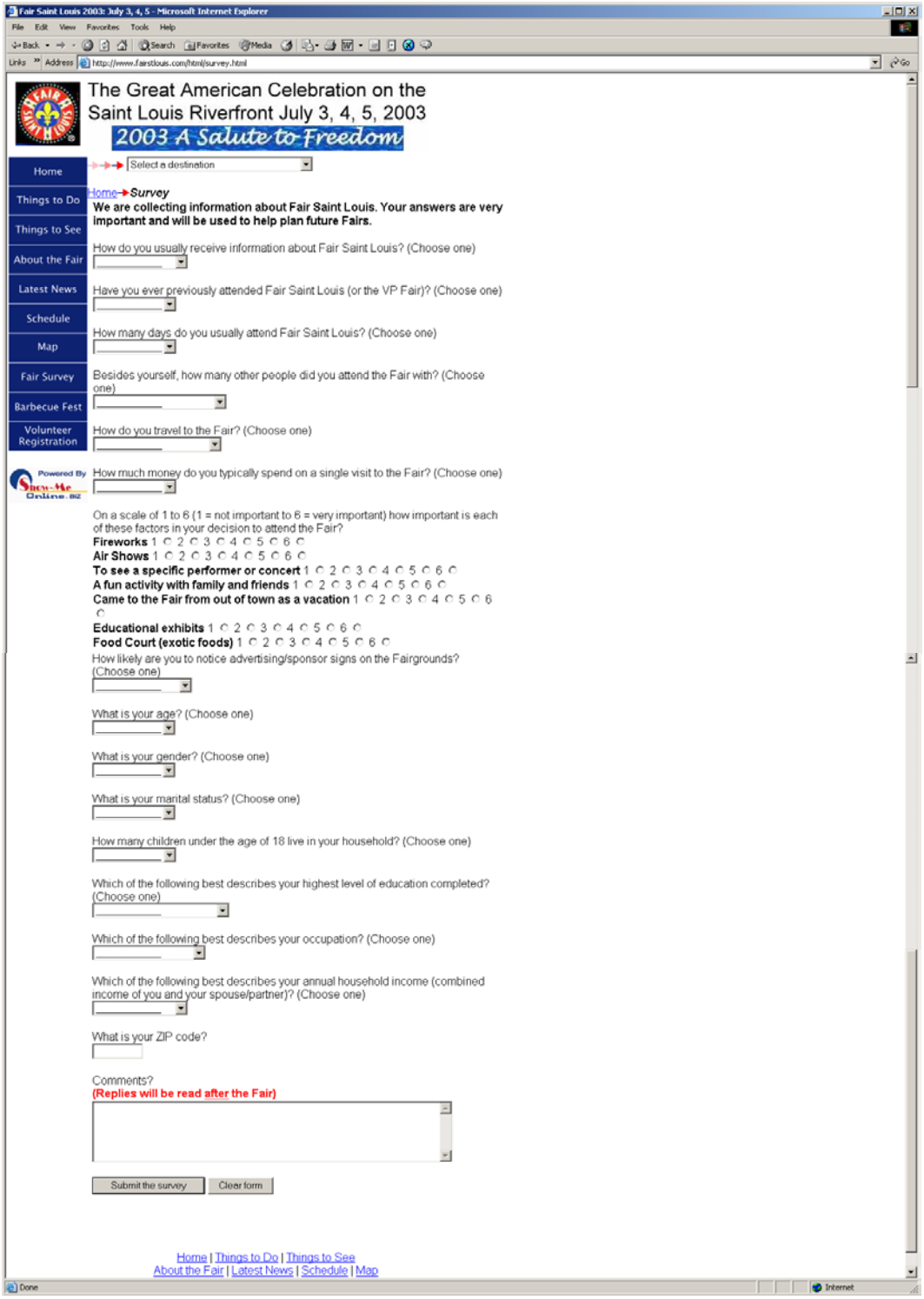
E. Event Planning

Policy: Periodically, events are held on state highways or on WSF ferries by municipalities or other organizations or private entities. It is the policy to allow such events on non-limited access facilities provided that the transportation effects of the event are well publicized and a traffic control strategy is developed by the event organizer and approved in advance.

Roles: WSDOT Headquarters Traffic Operations Office, WSF Operations Center, and Region Traffic Engineers' Offices approve events with coordination with state and local law enforcement, allowing for adequate public communications lead-time. WSP is often asked by event organizers to provide police services during events at the expense of the event organizer.

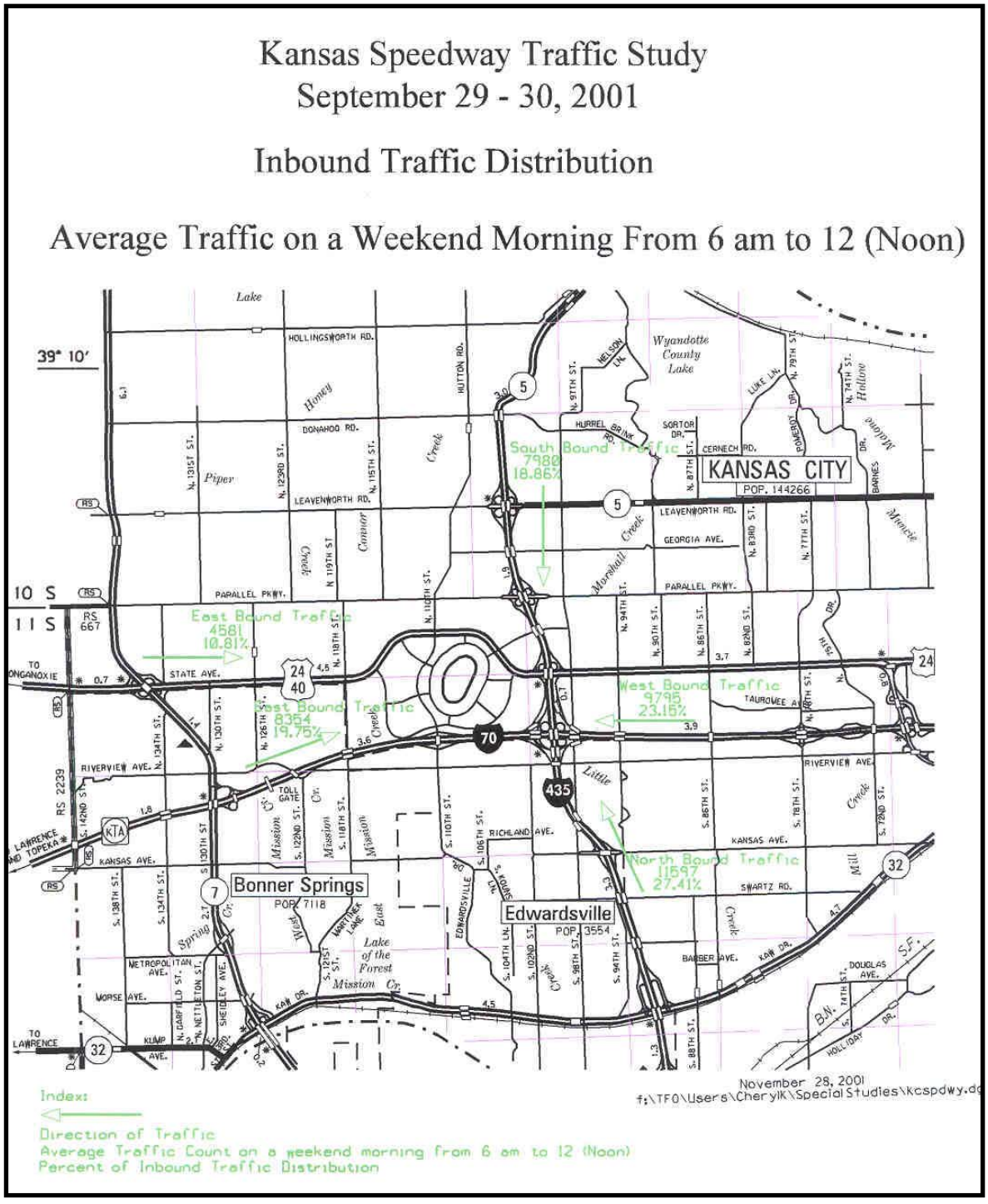
Reference: *Traffic Manual*, Chapter 7; MOU with WSP for special events/filming.

APPENDIX D
2003 FAIR SAINT LOUIS EVENT PATRON SURVEY



Source: www.fairstl.org

APPENDIX E
REGIONAL DIRECTIONAL DISTRIBUTION FOR 2001 NASCAR KANSAS 400



Source: Reference 20 (Chapter 5)

APPENDIX F
PARKING AND PEDESTRIAN ACCOMMODATION PLANS
LAMBEAU FIELD RECONSTRUCTION

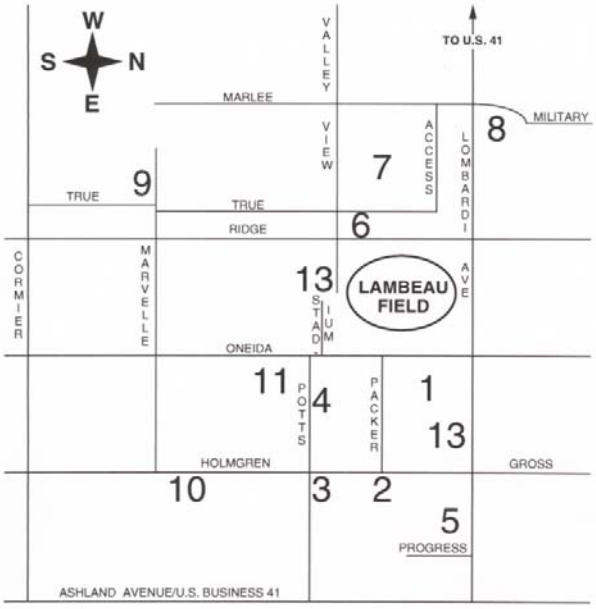
Source: www.packers.com

Packer Parking and Game Day Shuttle

In order to alleviate the inconvenience of game day parking for Packers fans due to the Lambeau Field renovation project and to head off severe traffic congestion, the ***Packer Parking and Game Day Shuttle*** program is being put into service. Although the Green Bay Packers do not receive revenue from this service, nor is the team responsible for off-site parking issues, they are cooperating with this program to help fans with the parking situation during the construction.

The current Lambeau Field parking lot is going to be approximately 3,000 parking spaces short of previous years totals, and general car parking, bus parking and RV parking will be eliminated on game days for the next two seasons. In order to organize the parking and traffic flow of vehicles coming to the games, parking areas have been identified and organized for incoming fans use and convenience. Ticket*Star will act as the clearing house for these convenient spaces located adjacent to Lambeau Field. **It is highly recommended by local police and traffic authorities that you secure your parking spaces in advance to avoid confusion and traffic congestion problems on game days. Parts of Oneida Street and Ridge Road will be closed on game days so normal traffic flows will be affected.** All car, bus and RV drivers can now call Ticket*Star at 1-800-895-0071 starting Monday, July 16 at 10:00 a.m. to order parking passes by the game or for the season. Ticket*Star has prime parking spaces available at lots including the Brown County Veterans Memorial Arena, Kroll's West, Stadium View Sports Bar and Grill, Kmart/D.A.R.E. lot, The Bar on Holmgren Way, Valley View School, Fabry Industries, the Lombardi Center and others. Along with your parking pass, advance orders will receive a map and directions, coordinated through police and traffic officials, detailing the easiest route to your parking lot. Although all lots are within easy walking distance of Lambeau Field, shuttles will be available at selected lots.

DO NOT WAIT UNTIL GAME DAY TO SECURE PARKING! Make your Packers game day experience a pleasant and well-planned event. Avoid the stress of finding parking and the hassle of traffic congestion by calling Ticket*Star today. Parking spaces are limited and available on a first-come first-served basis. Prices and tailgating activities vary depending on location and use.



#	Parking Area	Use	#	Parking Area	Use
1	Brown County Arena	Cars	9	Valley View School	Cars
2	Stadium View Sports Bar	Cars	10	Ashwaubenon Village Hall	Cars
3	The Bar On Holmgren Wy	Cars	11	Advance Business Center	Cars
4	Williams Auto Body Lot	Rv's	12	Valley Ridge Parking Lot	Cars
5	Fabry Industries Lot	Cars	13	WLUK Fox 11 Parking Lot	Cars
6	Kroll's West Lot	Cars/Buses			
7	Kmart/D.a.r.e. Lot	Cars/Buses/Rv's			
8	The Lombardi Center	Cars			

TICKET*STAR
1-800-895-0071

APPENDIX G
WISCONSIN DOT ORGANIZATION AND DISSEMINATION OF INTER-JURISDICTIONAL ROAD CONSTRUCTION AND PLANNED SPECIAL EVENT INFORMATION

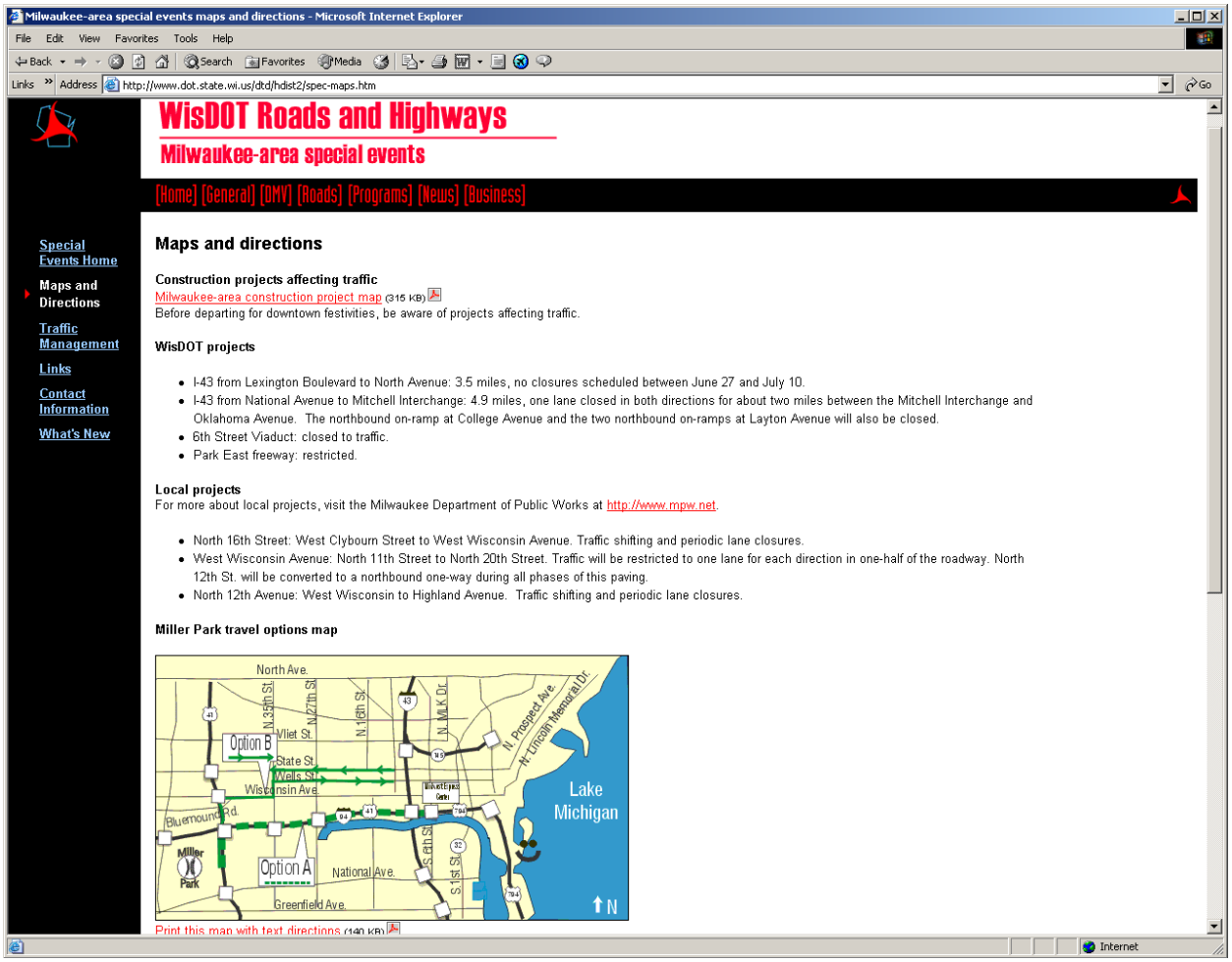
Summertime in Milwaukee is always busy, with entertainment venues of all kinds. Summertime is also the season for road construction, and sometimes the two interfere with each other. **This summer, Milwaukee will be hosting the All-Star baseball game and festivities at Miller Park. The annual celebration of baseball will be held on July 9, 2002 and will feature a full week of activities surrounding the All Star Game.** When all of the Fourth of July activities, the Circus Parade, and other entertainment in these few weeks are added up, there is a lot to plan for to keep visitors and residents moving during their travels to and from events.

This letter is being sent to various municipalities who may have road construction, street lane closures, or other work that is traffic related and will have an impact on the traveling public. Due to the extra volumes of traffic, it is important for all jurisdictions to work together and share information regarding the road construction. **If your city or district has any type of road construction happening during the end of June, 2002 extending in to the beginning of July, 2002, please enclose the following information for each construction event and mail it in the enclosed envelope:**

- City and Street Location of work
- Time of work and number of lanes closed
- Type of work
- Contact Person Name, Desk Phone, Mobile Phone, Fax, Email
- Any additional Information that is necessary for the project description

You may also fax your construction information to 414 227-2164. Please mark them Attention: Lisa. Your prompt attention to this letter is greatly appreciated!

Thank you, and best wishes for a safe and happy 2002:


Milwaukee-area special events maps and directions - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Links Address http://www.dot.state.wi.us/dtd/hdist2/spec-maps.htm
WisDOT Roads and Highways
Milwaukee-area special events
[Home] [General] [DMV] [Roads] [Programs] [News] [Business]
Special Events Home
Maps and Directions
Traffic Management
Links
Contact Information
What's New
Maps and directions
Construction projects affecting traffic
Milwaukee-area construction project map (315 KB)
Before departing for downtown festivities, be aware of projects affecting traffic.
WisDOT projects
I-43 from Lexington Boulevard to North Avenue: 3.5 miles, no closures scheduled between June 27 and July 10.
I-43 from National Avenue to Mitchell Interchange: 4.9 miles, one lane closed in both directions for about two miles between the Mitchell Interchange and Oklahoma Avenue. The northbound on-ramp at College Avenue and the two northbound on-ramps at Layton Avenue will also be closed.
6th Street Viaduct: closed to traffic.
Park East freeway: restricted.
Local projects
For more about local projects, visit the Milwaukee Department of Public Works at http://www.mpw.net.
North 16th Street: West Clybourn Street to West Wisconsin Avenue. Traffic shifting and periodic lane closures.
West Wisconsin Avenue: North 11th Street to North 20th Street. Traffic will be restricted to one lane for each direction in one-half of the roadway. North 12th St. will be converted to a northbound one-way during all phases of this paving.
North 12th Avenue: West Wisconsin to Highland Avenue. Traffic shifting and periodic lane closures.
Miller Park travel options map
North Ave.
N. 35th St.
N. 27th St.
N. 16th St.
N. MLK Dr.
N. Prospect Ave.
N. Lincoln Memorial Dr.
Option B
Vliet St.
State St.
Wells St.
Wisconsin Ave.
Bluemound Rd.
Miller Park
Option A
National Ave.
Greenfield Ave.
S. 6th St.
S. 13th St.
Lake Michigan
N
Print this map with text directions (140 KB)
Internet

Milwaukee area events and projects in summer 2002

WisDOT and local projects affecting traffic:

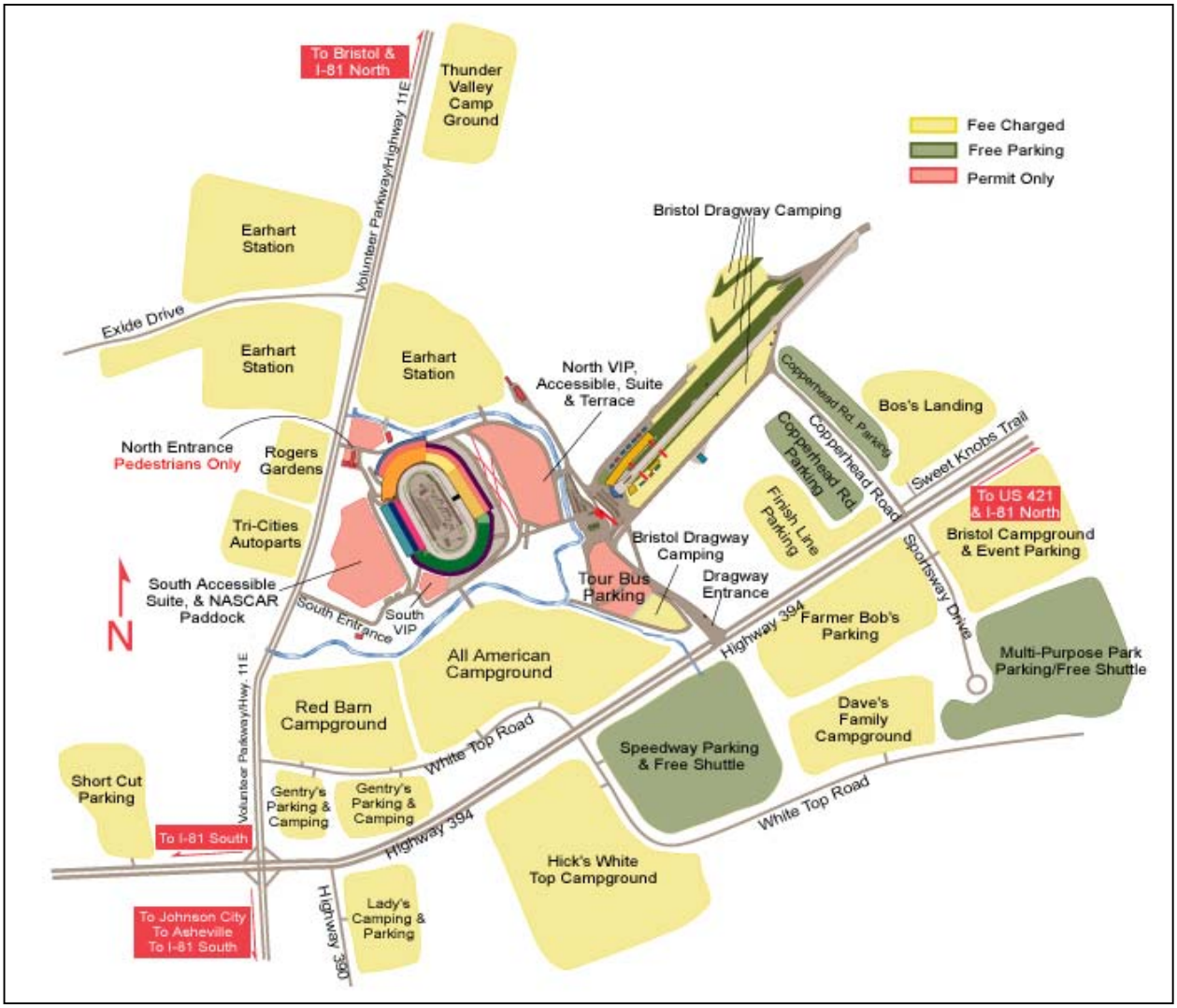
I-43 - Lexington Blvd. to North Ave (3.5 miles)
No closures are scheduled between June 27 and July 10.
I-43 - National Ave. to Mitchell Interchange (4.9 miles)
One lane will be closed in both directions for about two miles between the Mitchell Interchange and Oklahoma Avenue.
Also closed will be the northbound on-ramp at College Avenue and the two northbound on-ramps at Layton Ave.
6th St. Viaduct - closed to traffic
Park East Freeway - restricted
N. 16th St. - W. Clybourn St. to W. Wisconsin Ave.
W. Wisconsin Ave. - N. 11th St. to N. 20th St.
N. 12th St. - W. Wisconsin Ave. to Highland Ave.

APPENDIX H
EXAMPLE SITE AND PARKING MAPS

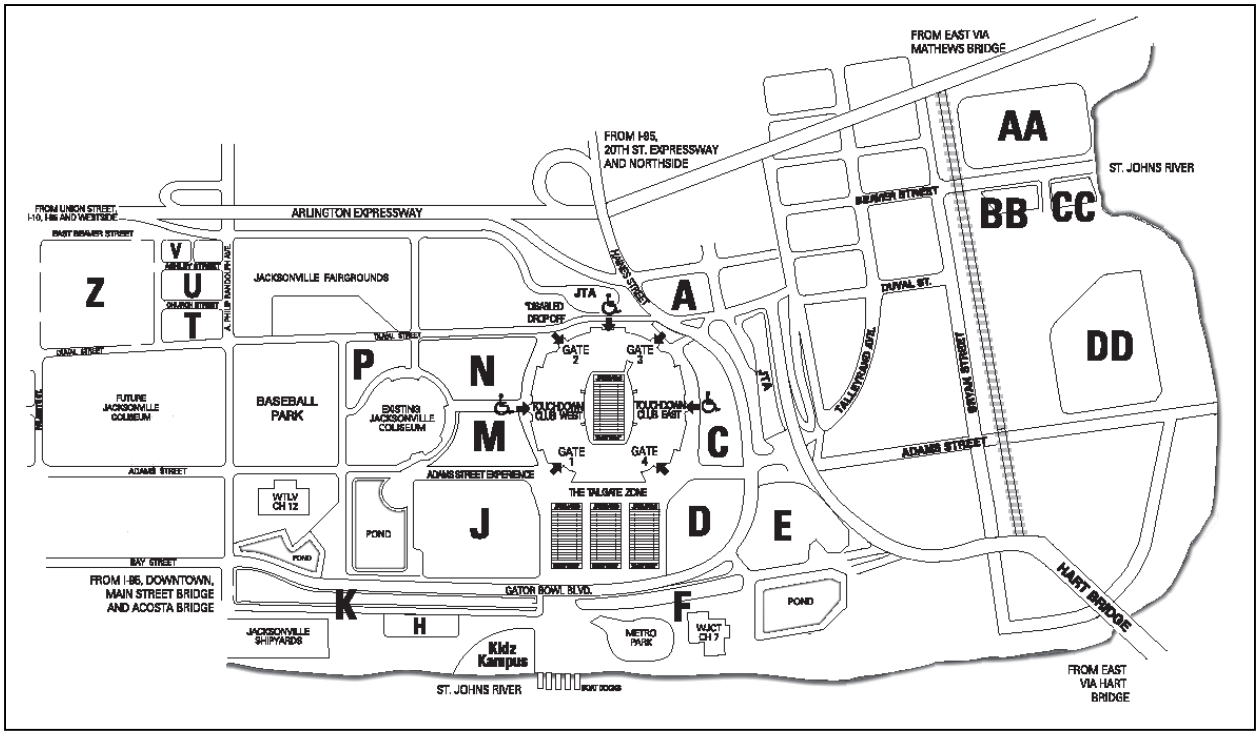
LAS VEGAS MOTOR SPEEDWAY

Source: www.lvms.com

BRISTOL (TN) MOTOR SPEEDWAY

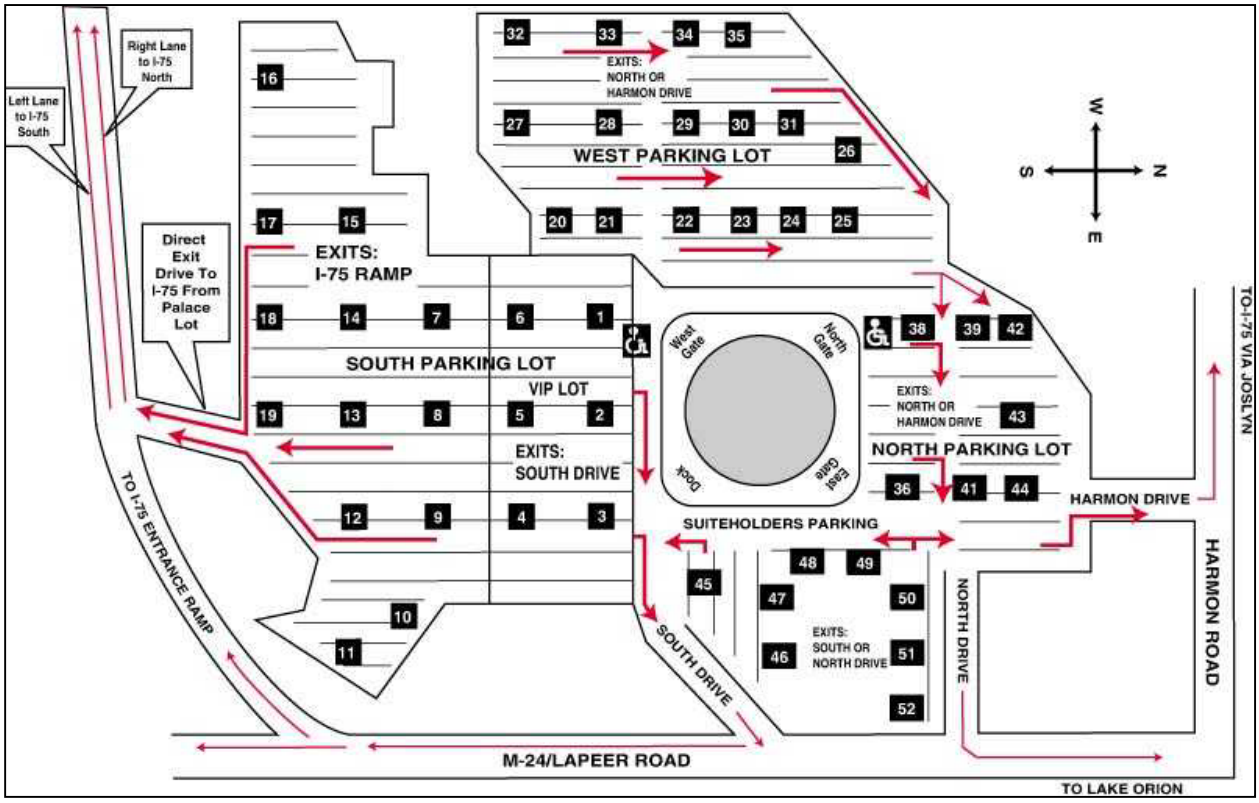


Source: www.bristolmotorspeedway.com



Source: www.jaguars.com

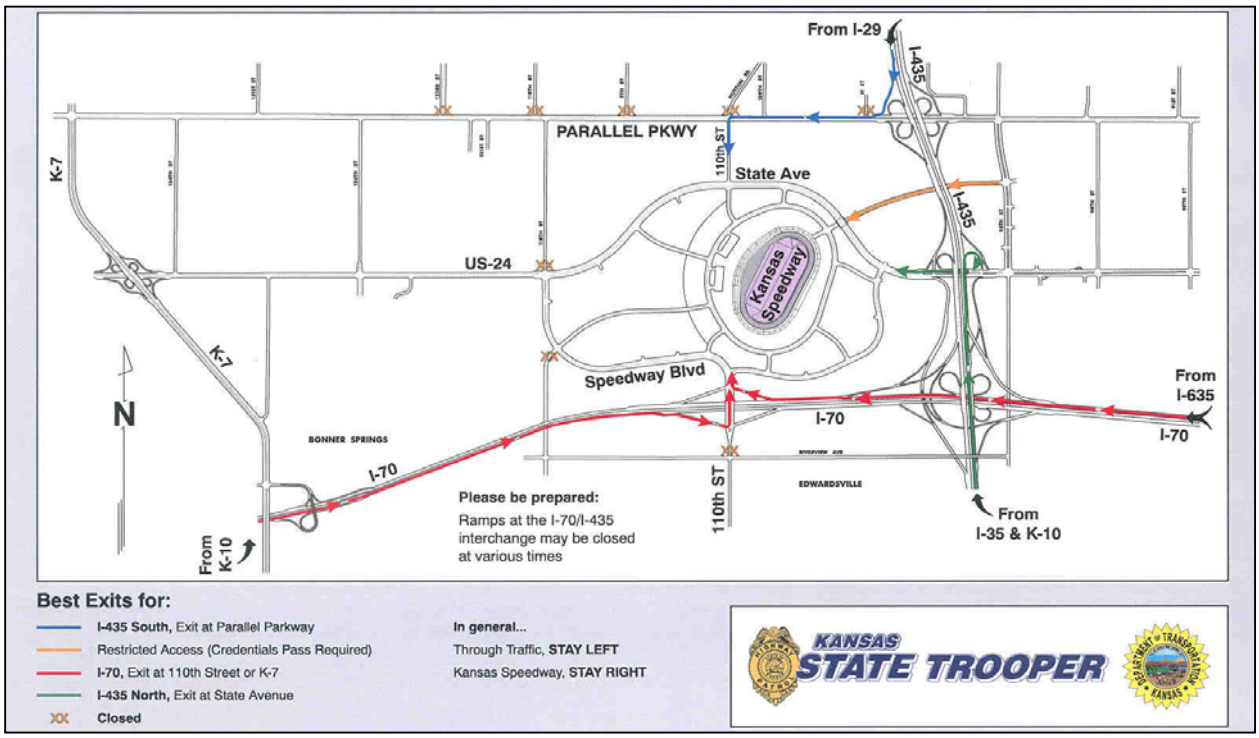
PALACE OF AUBURN HILLS (MI)
PARKING EGRESS MAP



Source: www.palacenet.com

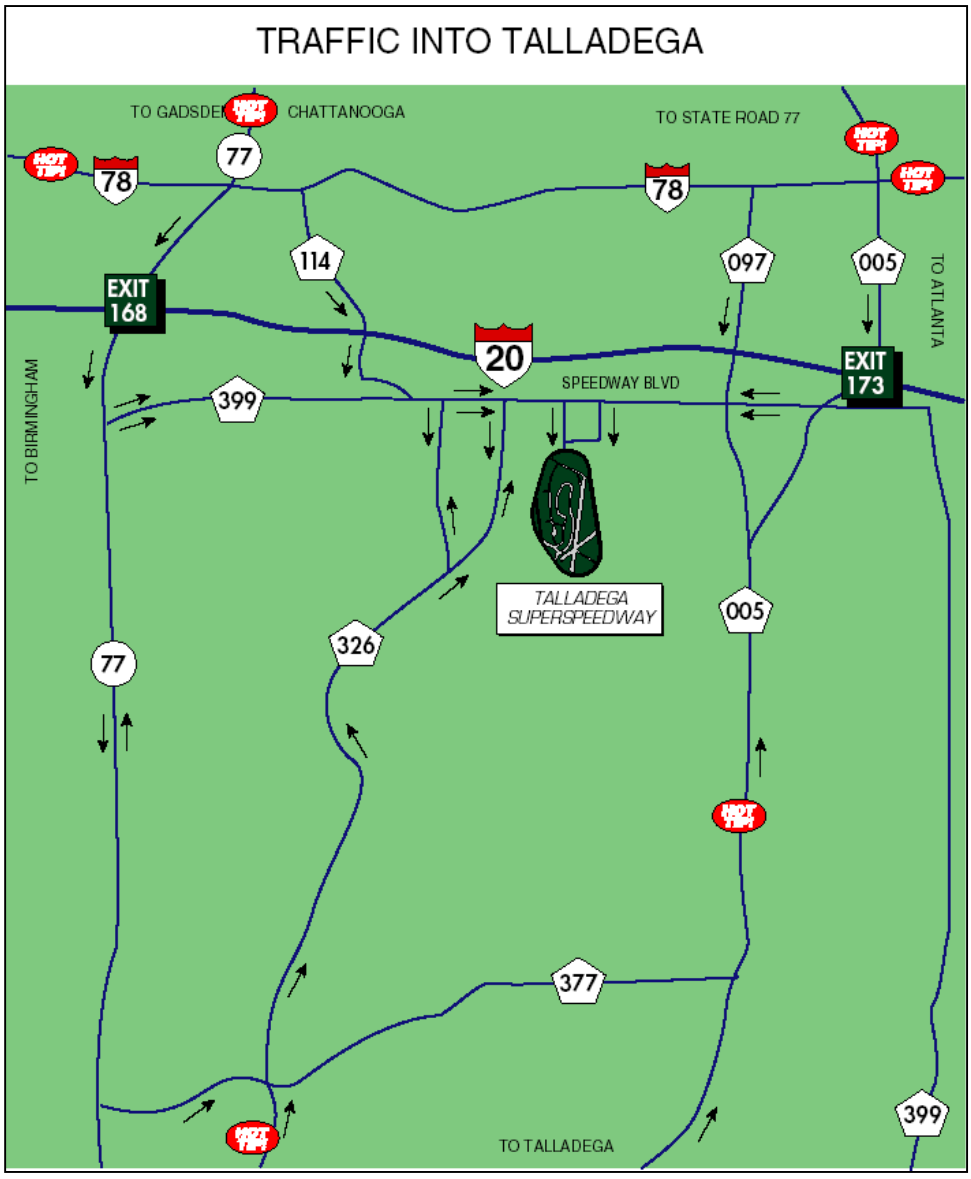
APPENDIX I
EXAMPLE TRAFFIC FLOW MAPS

NASCAR KANSAS 400



Source: Reference 15 (Chapter 6)

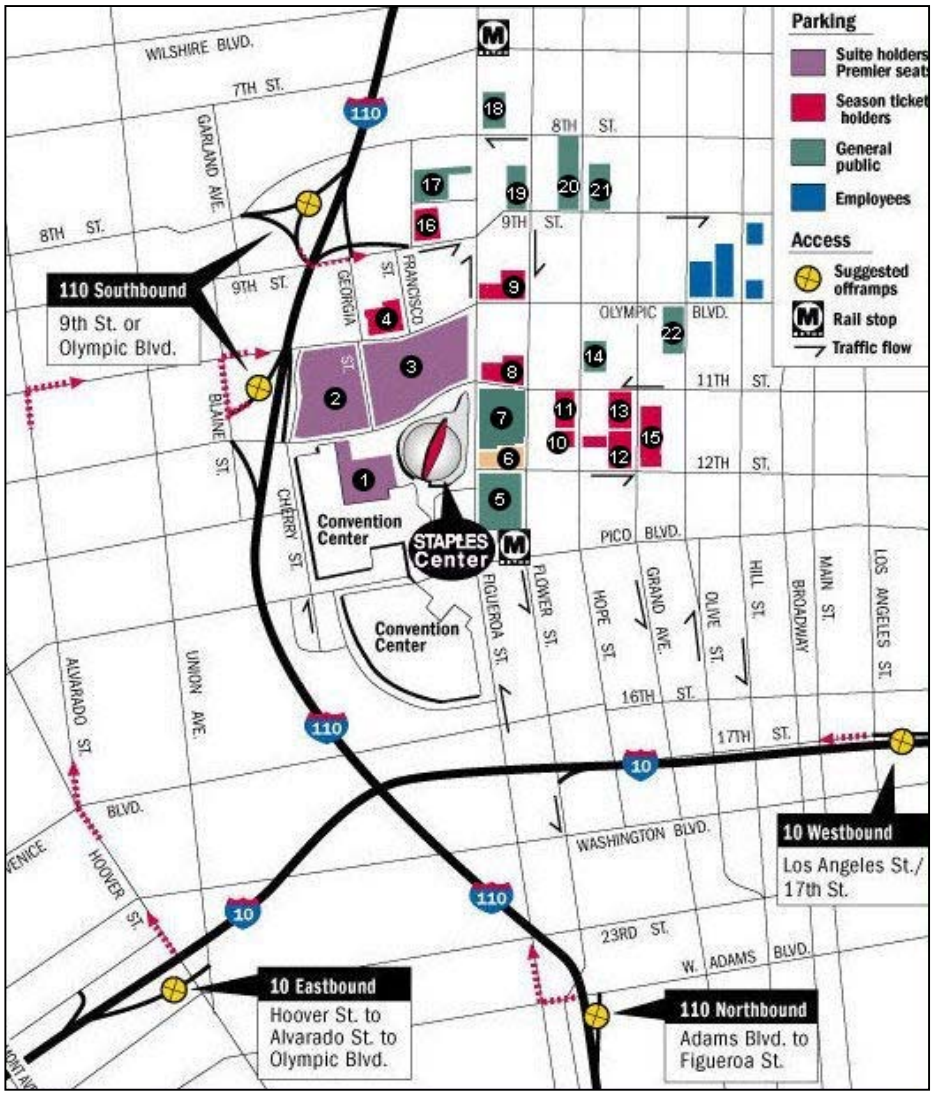
TALLADEGA (AL) SUPERSPEEDWAY



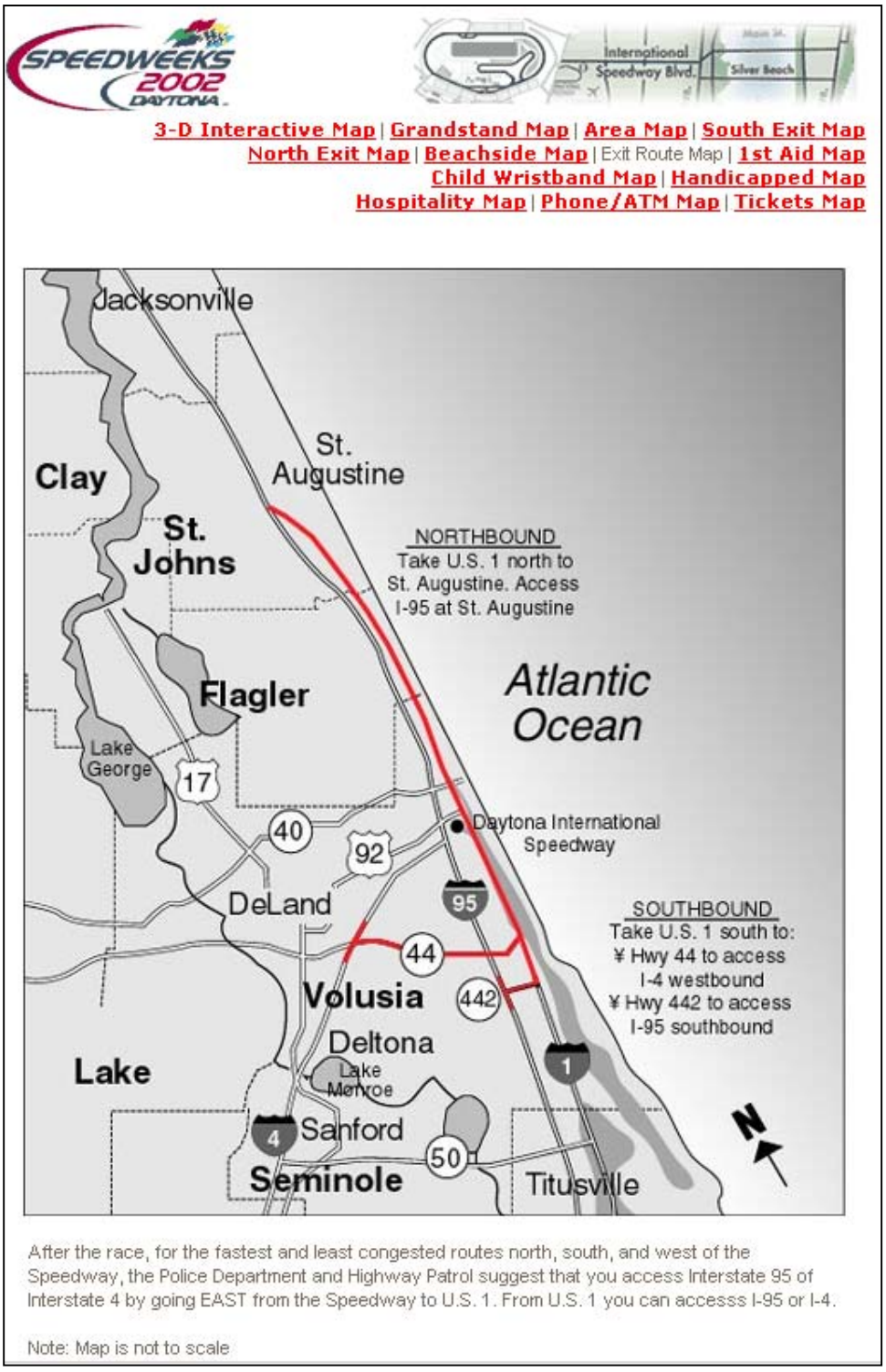
Note: "Hot Tip" indicates route not usually congested during event ingress.

Source: www.talladegasuperspeedway.com

STAPLES CENTER – LOS ANGELES, CA

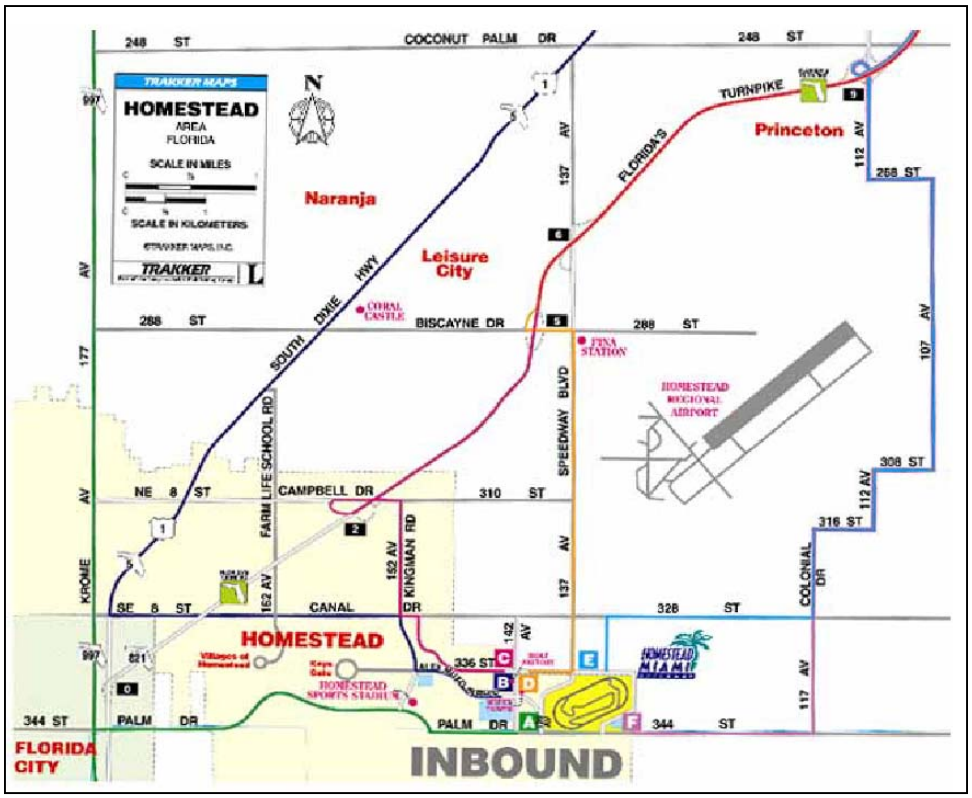


Source: www.staplescenter.com

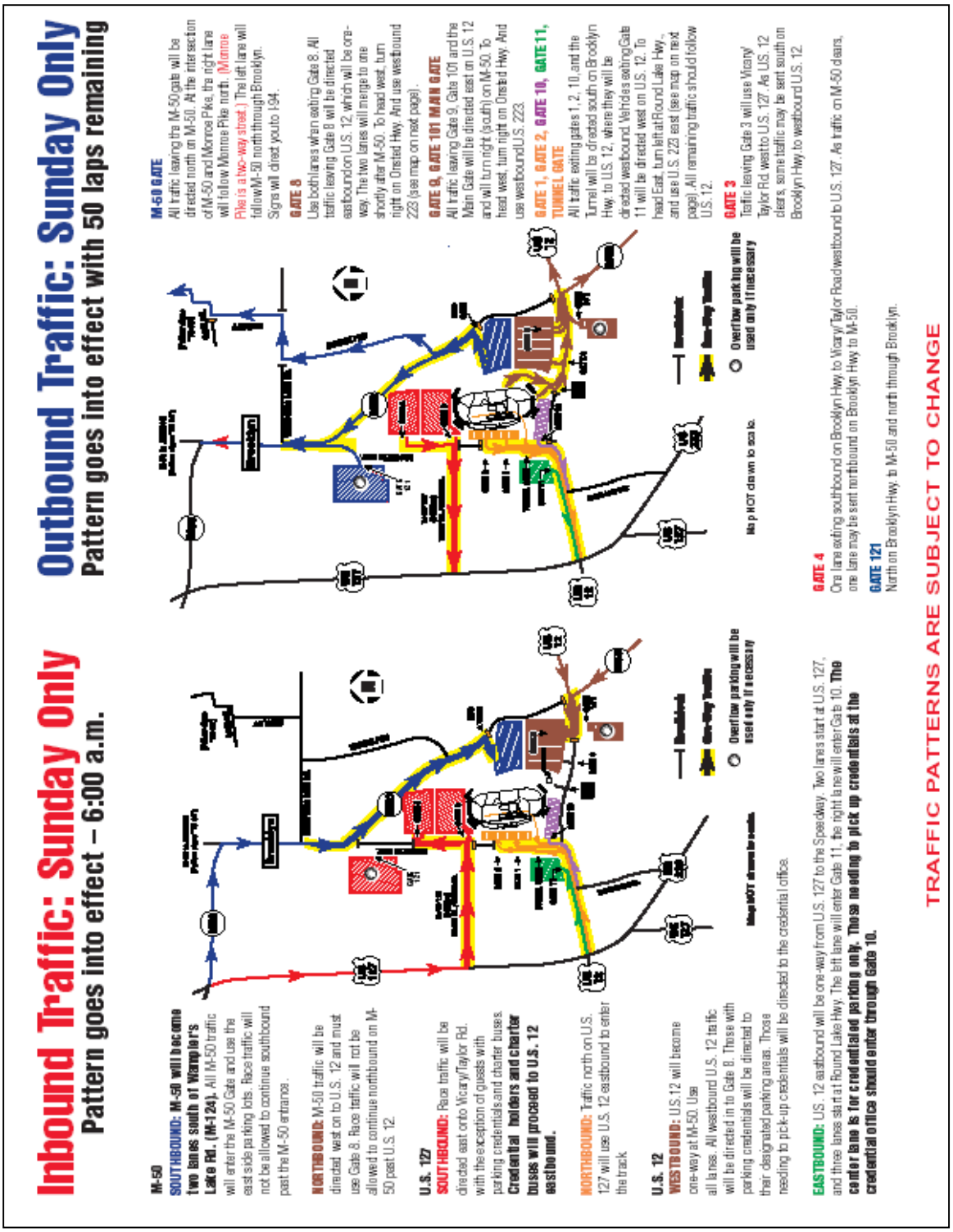


Source: www.daytona500.com

HOMESTEAD MIAMI (FL) SPEEDWAY

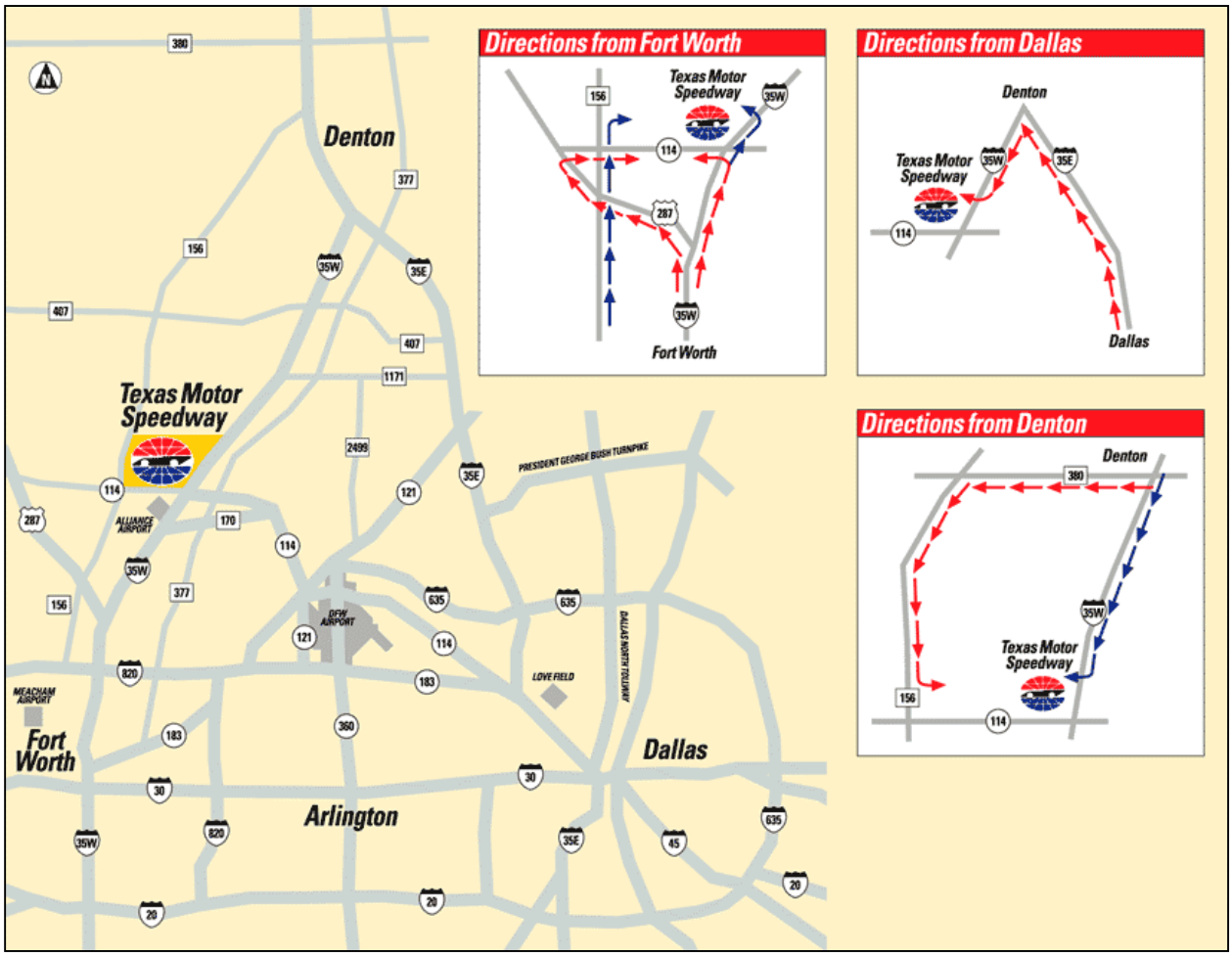


Source: www.homesteadmiamispeedway.com



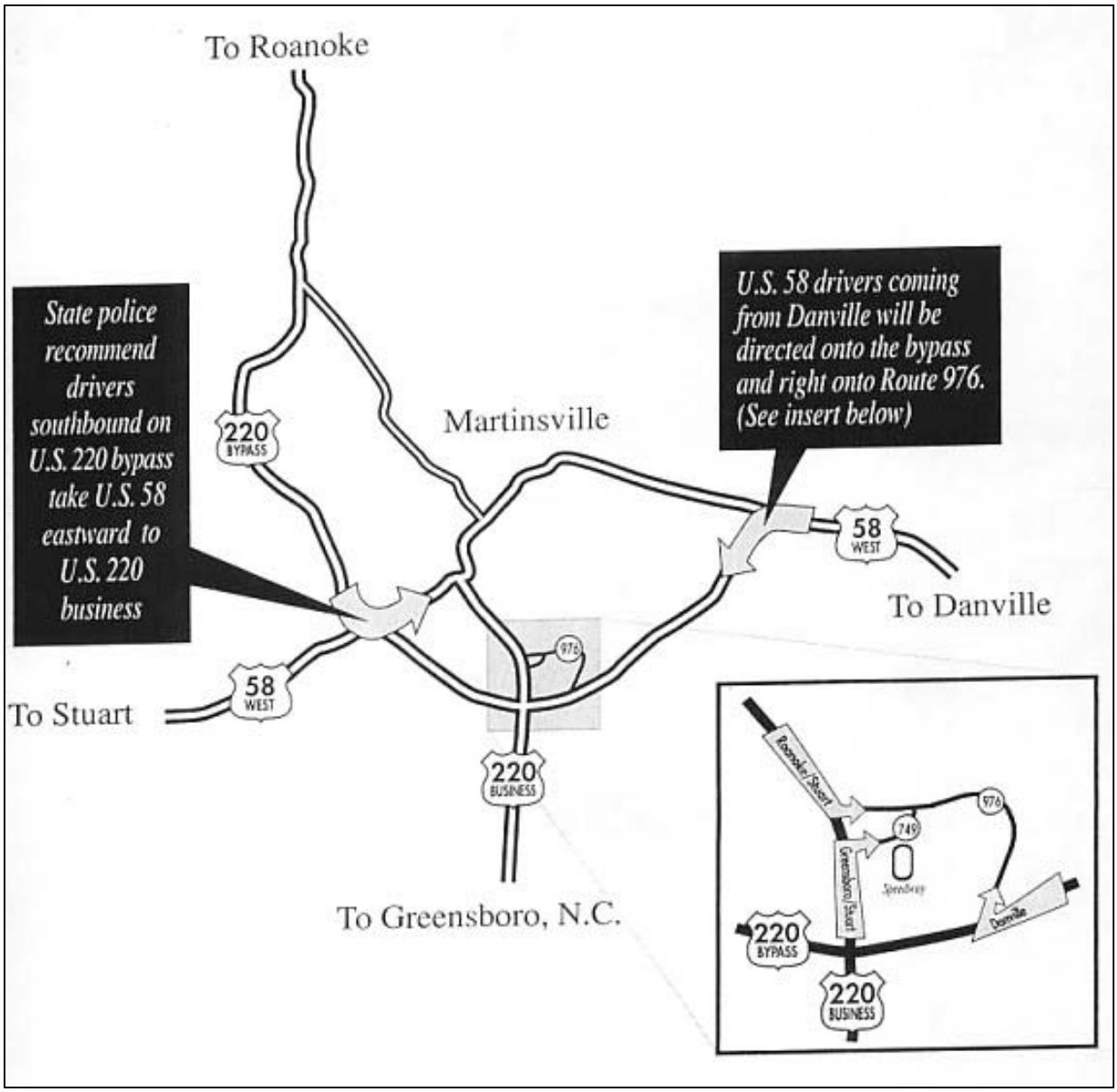
Source: www.mispeedway.com

TEXAS MOTOR SPEEDWAY



Source: www.texasmotorspeedway.com

MARTINSVILLE (VA) SPEEDWAY



Source: www.martinsvillespeedway.com

APPENDIX J
EXAMPLE PROTOCOL FOR PLANNED SPECIAL EVENT TRAFFIC SIGNAL SYSTEM OPERATIONS

ANAHEIM, CA

CONVENTION CENTER INBOUND

1. Bring up DISNEYLAND map by clicking the mouse's left button at the Disneyland icon on CITYWEST map or by hitting ALT and G keys simultaneously, and at the blue bar, type DLAND.

2. Sign on to the terminal with your MTM'S USER NAME and PASSWORD.

3. Type $MM to get the MASTER MENU and sign with your USER NAME and PASSWORD.

4. Check the timing plan schedule and if you think it will interfere with your operation, put section to OPERATOR mode.

5. Turn the cameras to watch for traffic:

Camera #:	Location	Watching Traffic Traveling:
Camera 4:	Harbor & Katella	Westbound at CC Kat. Ent.
Camera 5:	Katella & West	Southbound or Westbound
Camera 9:	Conv Way on Marriot	Westbound from Harbor

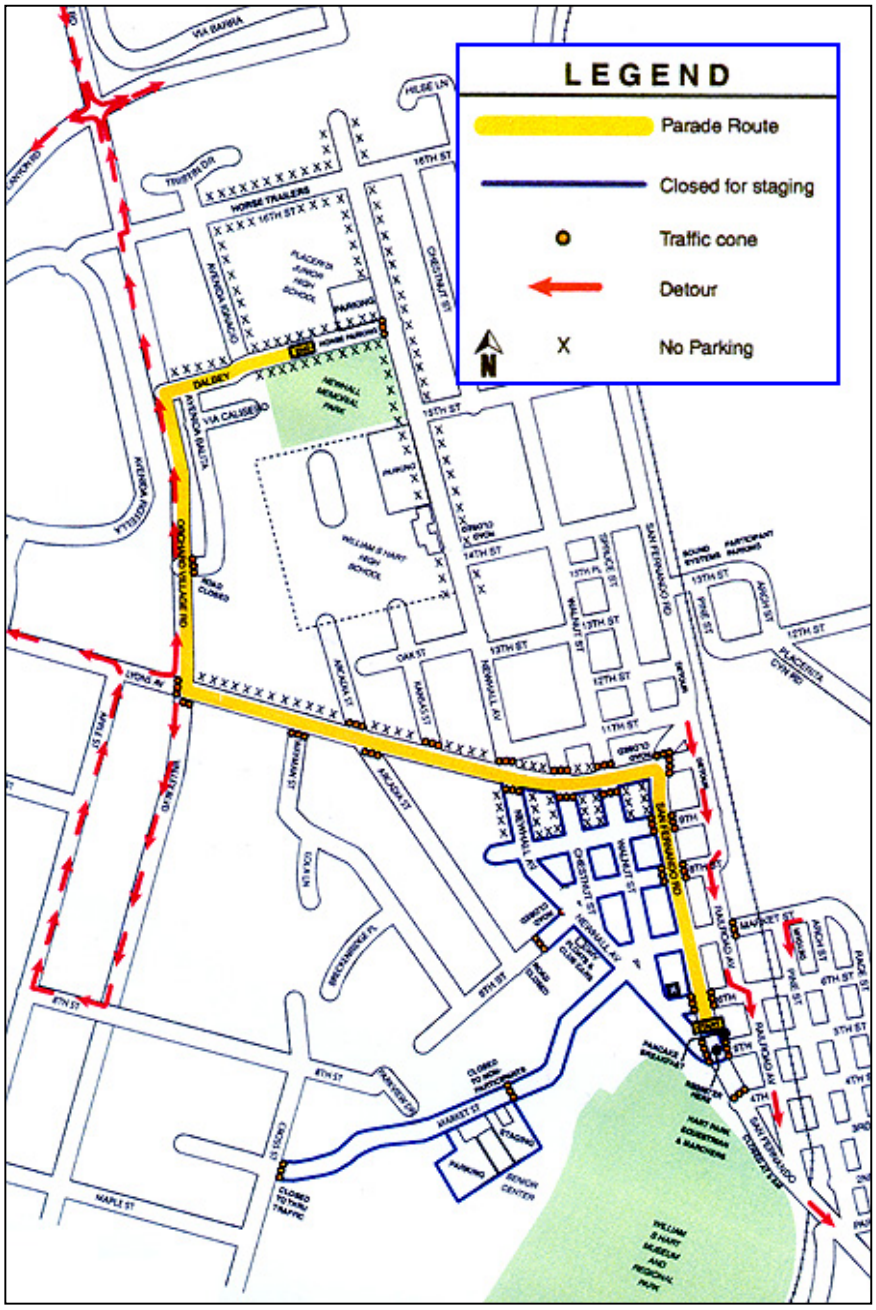
6. Pick up the following timing plan, as needed, if needed:
   17 (120 sec cycle)
   18 (140 sec cycle)
   19 (160 sec cycle)
   20 (180 sec cycle)
   21 (200 sec cycle)
   22 (220 sec cycle)

7. When traffic is over and if you did put section **7** in OPERATOR MODE earlier, now you have to put the section back to TOD MODE. Due to a bug in the system, after putting the section back to TOD MODE, you need to drop the section. Make sure they are all dropped by checking their status color (should be all dark blue). Now you can put the section back to the original plan that was scheduled. If it is supposed to be in STANDBY MODE, just leave the section in standby (dark blue).

Source: Reference 19 (Chapter 6)

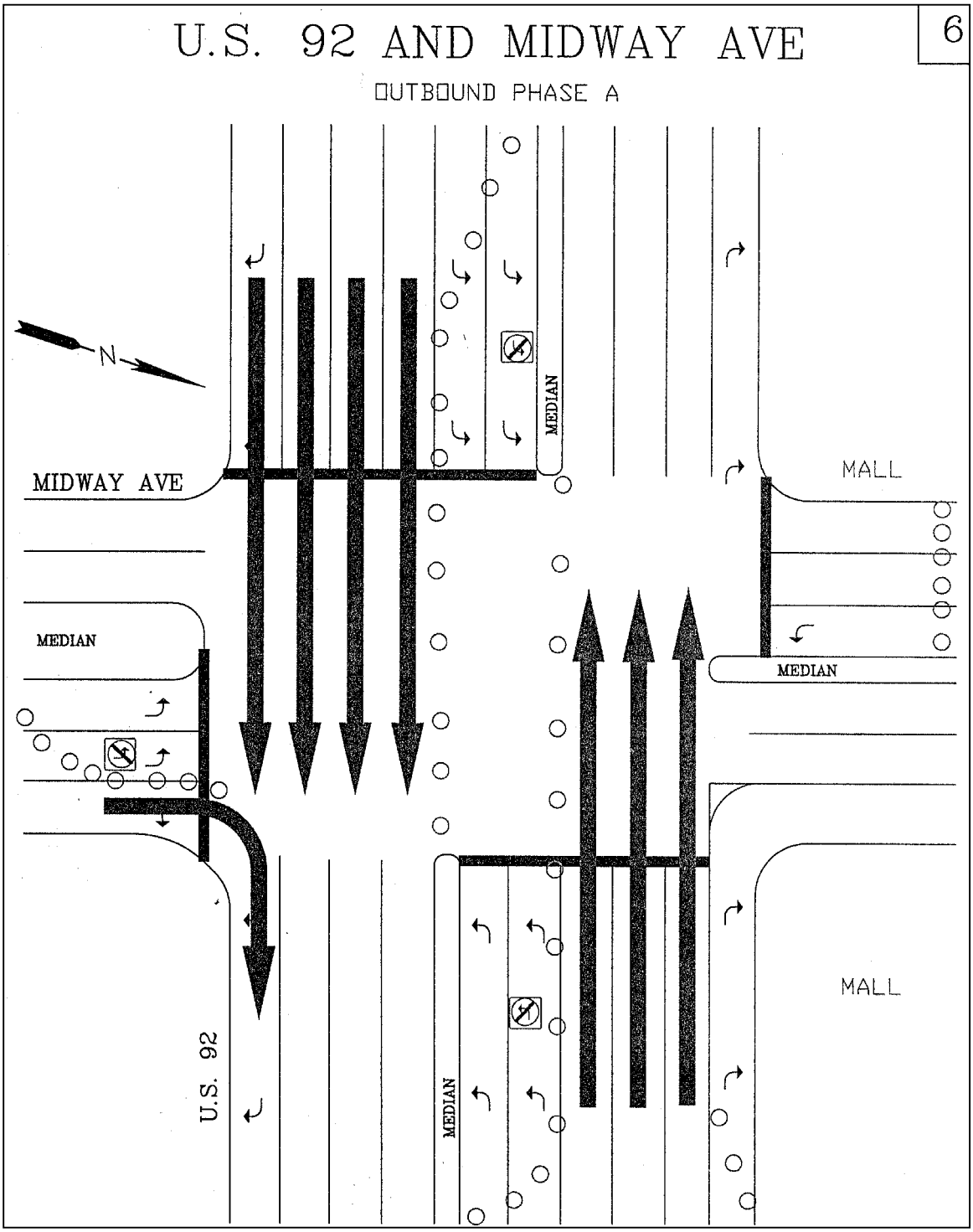
APPENDIX K
EXAMPLE TRAFFIC CONTROL PLANS

STREET CONTROL PLAN
SANTA CLARITA (CA) 4TH OF JULY PARADE



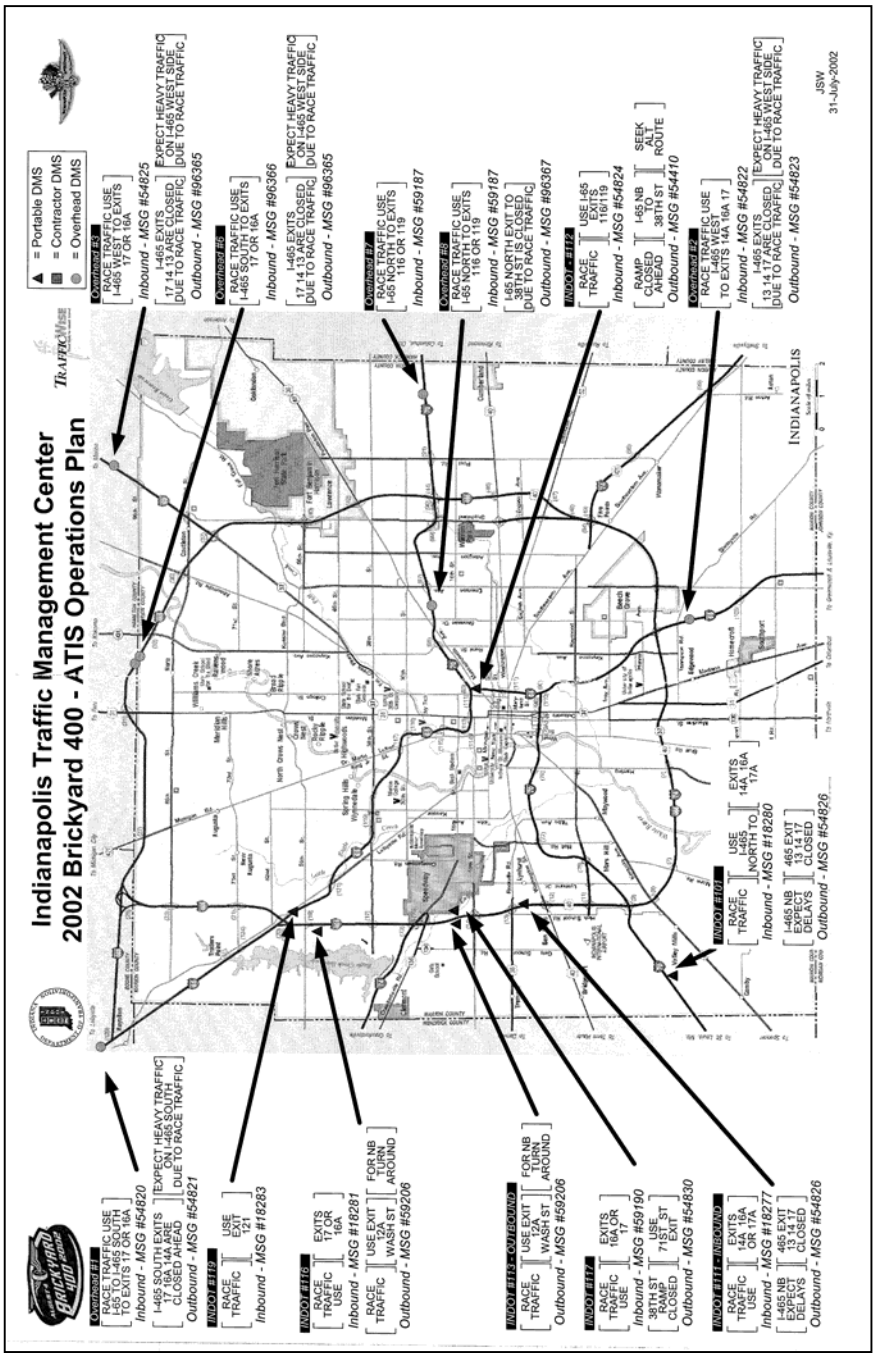
Source: www.scvleon.com/parade/

INTERSECTION CONTROL PLAN
DAYTONA (FL) SPEEDWEEKS



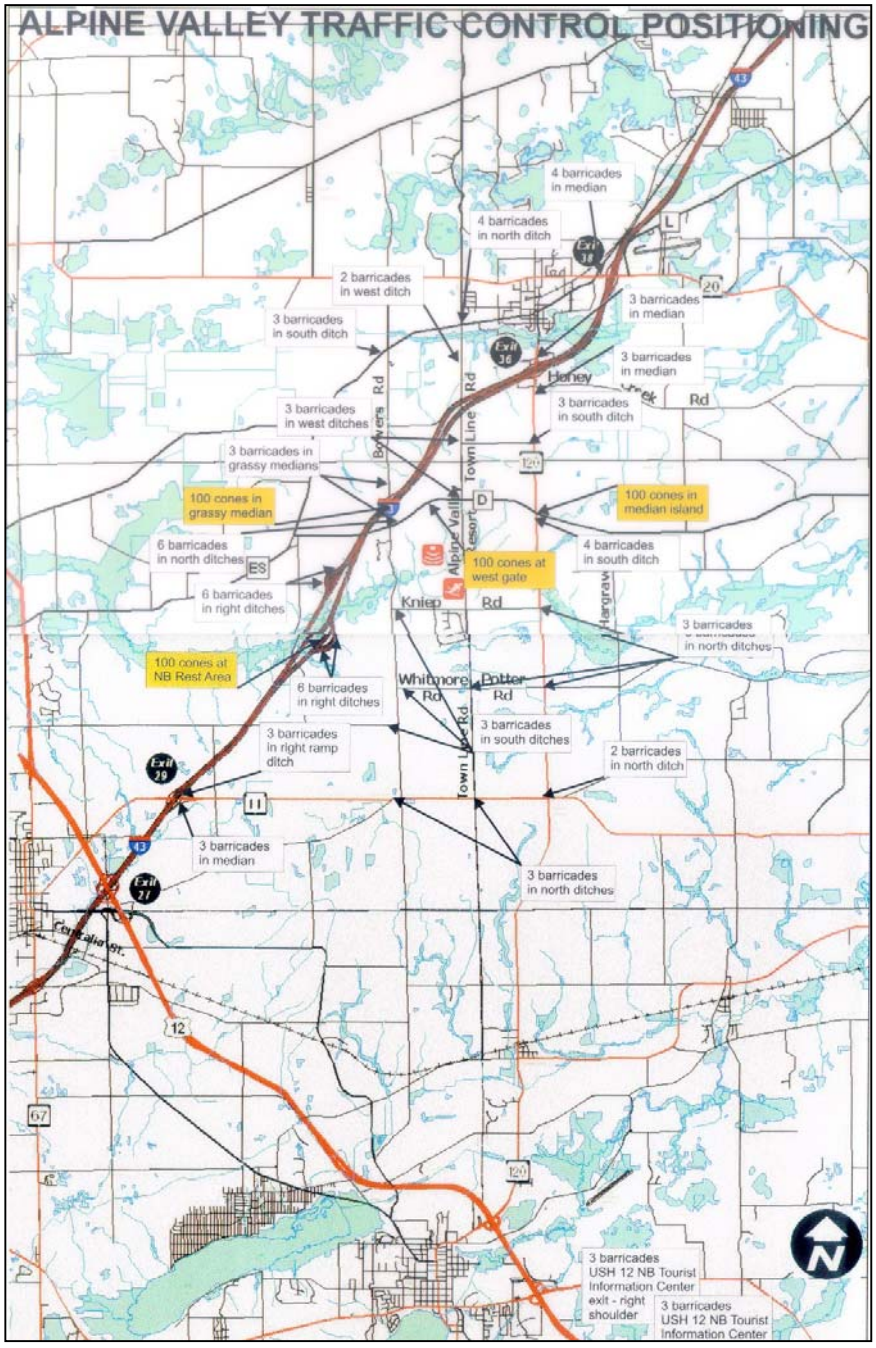
Source: Reference 18 (Chapter 6)

FREEWAY SIGNING PLAN
NASCAR BRICKYARD 400 – SPEEDWAY, IN



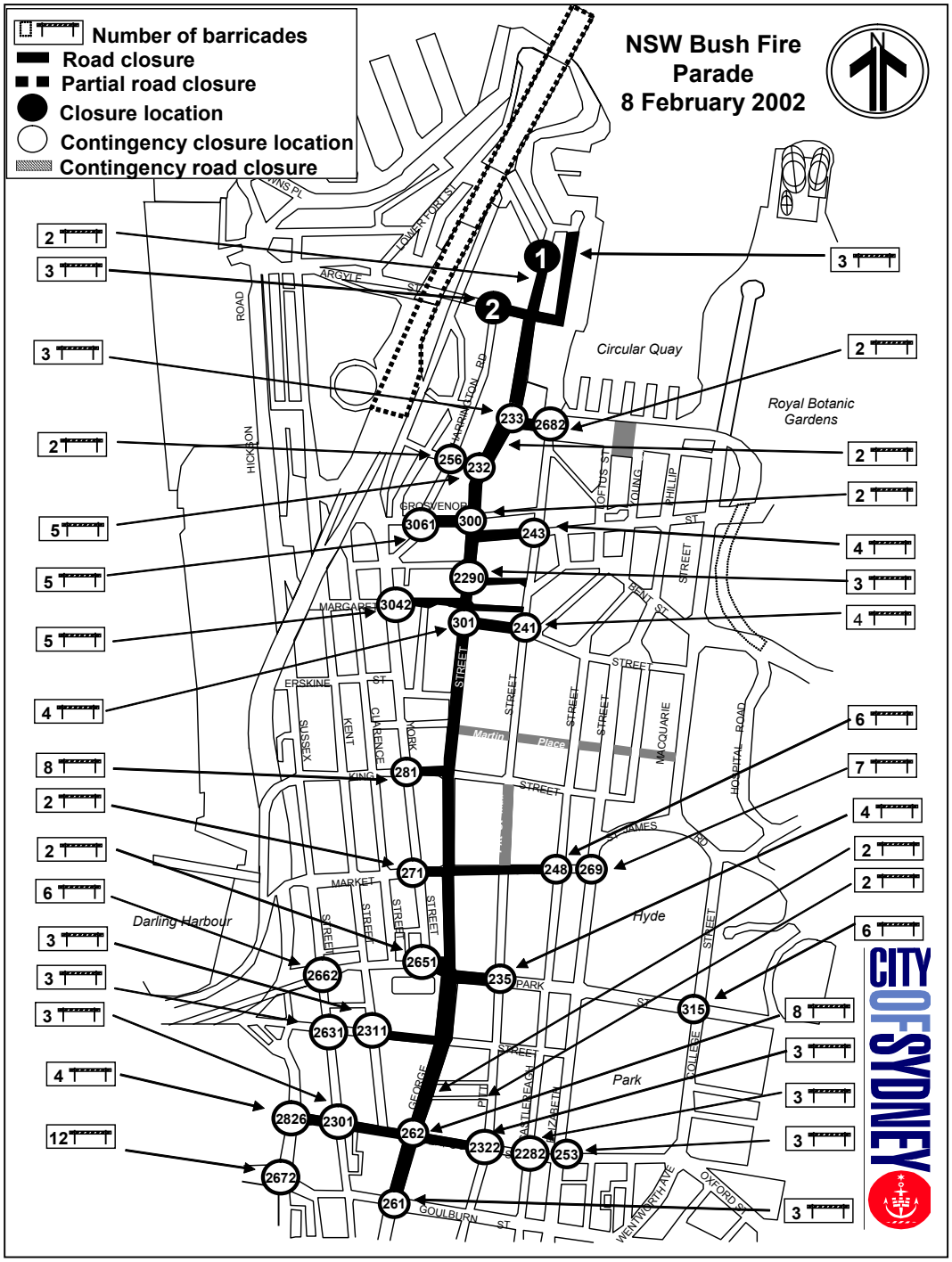
Source: Indiana DOT

EQUIPMENT LOCATION PLAN
ALPINE VALLEY (WI) CONCERT EVENT



Source: Wisconsin DOT

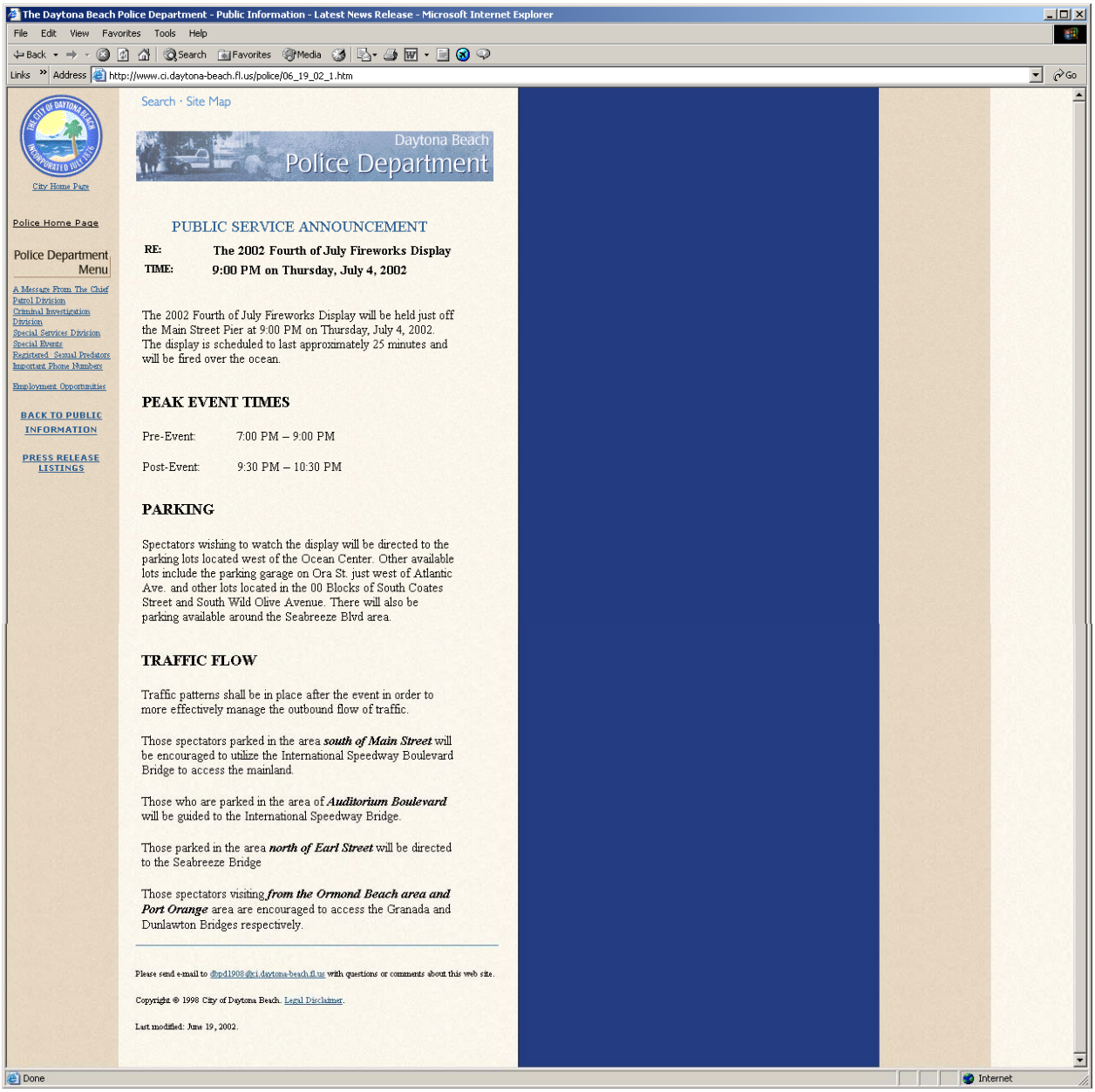
EQUIPMENT LOCATION PLAN
SYDNEY, AUSTRALIA PARADE



Source: Reference 20 (Chapter 6)

APPENDIX L
PUBLIC AGENCY AND EVENT-SPECIFIC WEBSITES

DAYTONA BEACH (FL) POLICE DEPARTMENT



Source: www.ci.daytona-beach.fl.us/police/special_events_safety_security.htm

Chicago: Dept. of Transportation - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites Media

Links Address http://www.ci.chi.il.us/Transportation/TravelAdvisories/Taste2002G.html

City of Chicago | Home | Mayor's Office | Search/Subject List | Site Map | Feedback | What's New

Department of Transportation

Dept. Home Dept. Contacts

Richard M. Daley, Mayor
Miguel d'Escoto, Commissioner
Department of Transportation

Traffic Advisory

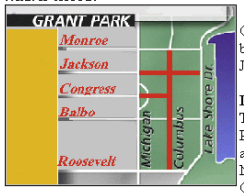
Taste of Chicago Opens
June 28-July 7, 2002

---TASTE OPENS ---

Some food for thought for traveling to the Taste of Chicago.

The dinner bell opening the 2002 Taste of Chicago rang on Friday June 28th, at 11:00 a.m., and continues through July 7th! There are many great ways to get to the Taste.
Here is a menu of ideas.

What is closed?



Columbus between Monroe and Roosevelt, Congress between Michigan Avenue and ColumbusDrive, and Jackson from Lake Shore Drive to Michigan Avenue.

If I drive, where do I park?
The Millennium and Monroe Garages are right in Grant Park, with entrances on Columbus between Randolph and Monroe. Park for $10 for 12 hours.
NEW SHUTTLE SERVICE --- McCormick Place - On Saturday and Sunday. Taste Shuttle service will operate from the lots on King Drive near 25th Street main entrance to McCormick West, and the 31st street lot off of Lake Shore Drive. The shuttles will run from one hour before and after the Taste and offer an excellent alternative to park away from the fest grounds and avoid congestion. Anyone coming from the west can exit I-55 at King Drive, and turn left into Lot A.

Can't I just park at the Museum Campus?
With Soldier Field construction, Museum Parking is very limited and expected to be at capacity at most times with Museum visitors. See the free Trolley information and public transportation info

I would rather leave the car at home!
CTA and Metra are the best way to reach the fests. The Elevated lines stop at Wabash and Adams, and the Red and Blue Line stops at Jackson are within a 10 minute walk to the Taste. Plus Chicago's free trolleys will offer increased service to and from the Taste of Chicago! All lines will run from 10:00 a.m. to 7:00 p.m. from June 28 to July 7. (July 3 service ends at 6:00 p.m.) On the Metra/Museums (green) route, twice as many trolleys will run.
Throughout the Taste, green route trolleys will arrive about every 10 minutes. Your personal CTA, Pace, and Metra trip information is a quick phone call away at (any area code) 836-7000.

I'm a daily commuter wanting to avoid any congestion around Grant Park due to Taste closures!
Traveling southbound on Lake Shore Drive, from the north, exit at Michigan Avenue or Grand. Traveling northbound LSD from the south, exit at Roosevelt over to Canal and Clark, and enter the loop from the west to avoid Grant Park congestion.
Closures remain through Monday mid-day, July 8th. Morning commuters can also avoid congestion by using Monroe instead of the more heavily traveled Washington from the JFK into the city.

For event and travel information including 24 hour travel times, weather and e-mail bulletins visit www.cityofchicago.org/intheloop and AM 1650 for Lake Shore Drive Travel information.

REVIEW

So again, what's different this year?

1. A new free weekend taste shuttle service from the McCormick lots at King Drive and 31st Street, letting you avoid all congestion.
2. Limited parking at Soldier Field because of reconstruction, that will be filled most of the time with Museum visitors, so go directly to Millennium or McCormick (on the weekends) if your headed to the fest or fireworks.
3. Trolley service between Metra Stations and the Museum Campus is greatly beefed up during the entire Taste.

Visit www.cityofchicago.org/transportation/trolleys/ for Trolley routes.

How do I get to the parking again?
Millennium and Monroe Garages are steps from the Taste, and accessible from Columbus, between Randolph and Monroe. From Michigan Avenue or Lake Shore Drive simply take Randolph turning south on Columbus right into the garage. From the Expressway system, take Ohio all the way to Fairbanks and South to the entrances. (Fairbanks turns into Columbus as you go south.)

McCormick Lots:
McCormick Place - On Saturday and Sunday. Taste Shuttle service will operate from the lots on King Drive near 25th Street main entrance to McCormick West, and the 31st street lot off of Lake Shore Drive. Anyone coming from the west can exit I-55 at King Drive, and turn left into Lot A.

And 836-7000 from any Chicago area code gets you public transportation information.

Source: www.ci.chi.il.us/Transportation/

SEATTLE CENTER
SEATTLE, WA

Source: www.seattlecenter.com

ENTERTAINMENT AND SPORTS ARENA
RALEIGH, NC

GENERAL INFORMATION

General parking may be purchased in advance at Arena Box Office or through the Group Sales Department.

The Arena Main Entrance is located on Edwards Mill Road. To avoid traffic congestion, please access the facility from Wade Avenue to Edwards Mill Road. Blue Ridge Road should be avoided.

VIP and Premier Parking entrances are off Westchase Road from Blue Ridge Road. VIP and Premier parking pass holders entering any other gate will be directed to these reserved lots.

Private vehicle entrance directly from **Wade Avenue** is not permitted. Westbound buses may use this entrance by exiting Wade Avenue at Edwards Mill Road and following the bus entrance signs. Eastbound buses must use the Edwards Mill Road entrance to the parking lot and follow the bus parking signs.

Buses, shuttles, vans, limousines, taxis, and other multiple transportation vehicles are permitted to enter the Entertainment & Sports Arena directly off Wade Avenue at Gate E or at Gate C off Trinity Road. Appropriate signs should be displayed in the vehicle windshields if no commericial markings are visible.

Top

FREE MOTORIST ASSISTANCE

- Lockout Assistance
- Jump Starts
- Flat Tire Assistance
- Lost Car Assistance
- Towing

Contact Guest Services, Security, or any Parking Attendant for help.

Please Note: Increased police officers and security measures are in place at the Entertainment & Sports Arena.

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IMPORTANT PHONE NUMBERS

Guest Services Hotline 919.861.CARE
Arena Info 919.861.2300
Arena Security ..... ext. 1141
Arena Parking ..... ext. 2802

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ENTRY AND DEPARTURE FLOW TIMES

(Based on 13,000 guests and 5000 vehicles)
If you arrive at the ESA, your access time will be:

Arrival Flow Time / Approximate Parking Time

6:00 pm - 6:10 pm / APT 3 minutes
6:10 pm - 6:20 pm / APT 8 minutes
6:20 pm - 6:30 pm / APT 12 minutes
6:30 pm - 6:40 pm / APT 18 minutes
6:40 pm - 6:50 pm / APT 24 minutes
6:50 pm - 7:10 pm / APT 26 minutes

Departure Flow Time / Approximate Departure Time

1 - 5 minutes after game / ADT 5 - 10 minutes
5 - 10 minutes / ADT 10 - 20 minutes
10 - 20 minutes / ADT 20 - 25 minutes
20 - 30 minutes / ADT 25 - 35 minutes
30 - 40 minutes / ADT 18 - 25 minutes

Top

PARKING FEES:
(Fees may vary for select events - check the event page for your event to be sure)

Automobiles	$7.00
Limo/RV	$12.00 (no overnight parking)
Bus	$20.00 (larger than 15 passenger vans)

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WHY TO ARRIVE EARLY/HOW TO BEAT TRAFFIC BEFORE AND AFTER THE GAME:
Did you know that in addition to the games, the ESA has many exciting things for you to do during each visit to the Entertainment and Sports Arena?

Come Early & Enjoy these Pre- and In-Game Activities

- Participate in the free AT&T Wireless Phone Game. Register at Section 103 or at the AT&T Business Center
- Visit The Deck sponsored by Colony Homes for pub style food and a great view of the game.
- Sign up for Promotions during each game (Visit the Promotions Kiosk for more information)
- Watch for up-to-date statistics and special features on the Jumbotron.
- Purchase Carolina Hurricanes, NCSU, and Cobras merchandise in The Eye merchandise stores
- Tailgate with family and friends pre-game in the parking lot (Parking Lots open two hours before game time)
- Get the first bid on Kids N' Community Silent Auction Items
- Watch the Teams warm-up

Don't Leave the ESA without Checking out these Post-Game Activities

- Stop by The Deck for post-game refreshments
- Enjoy a live band performance every Fridays and Saturday night post -game in the Arena Club (free for everyone!)
- Take a shot on goal on Slapshot Sunday.... after most Sunday Afternoon games and some Saturday afternoon games, all children can take a shot on goal right on the ice.

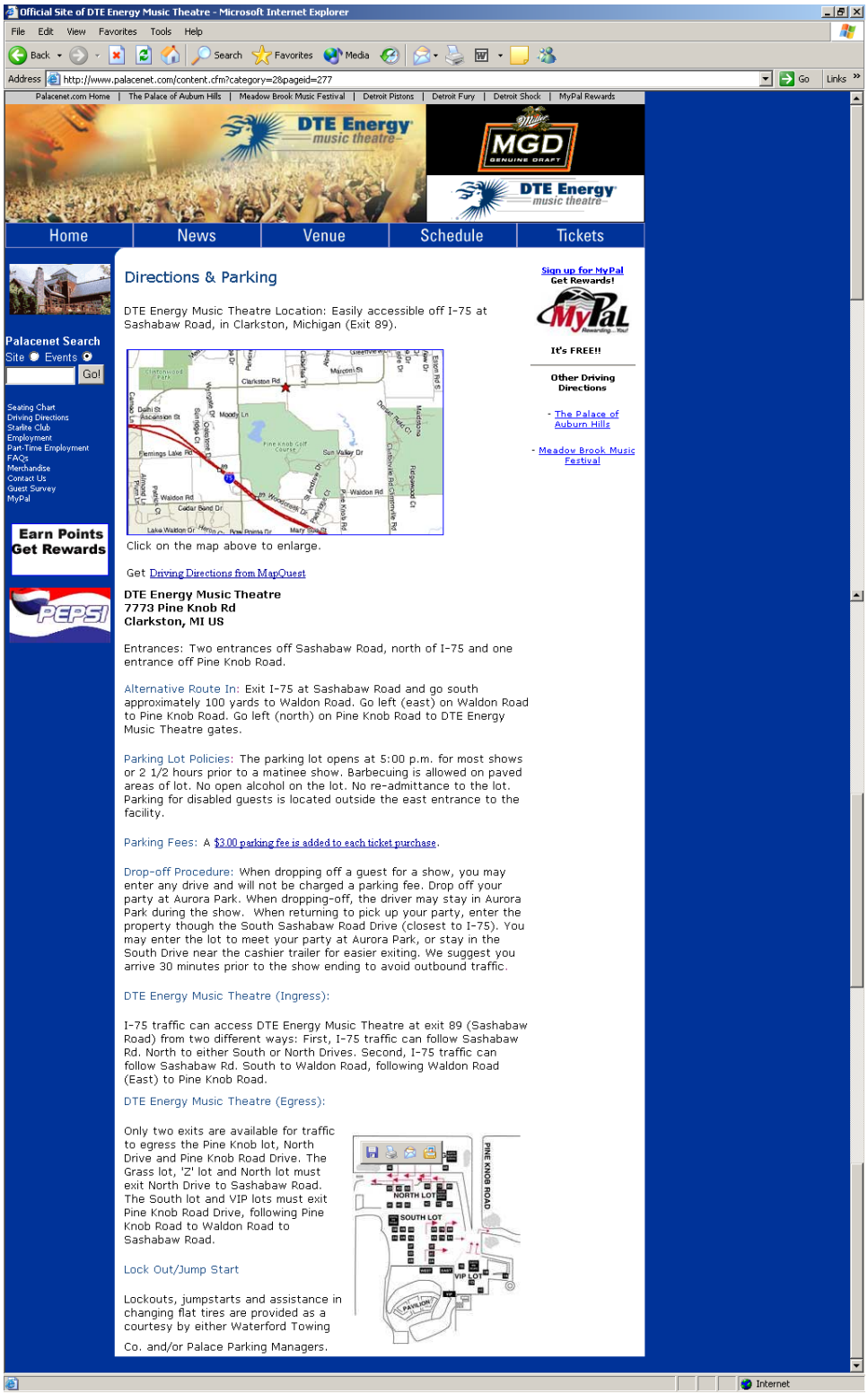
Top

Source: www.esa-today.com

RICHMOND INTERNATIONAL RACEWAY
RICHMOND, VA

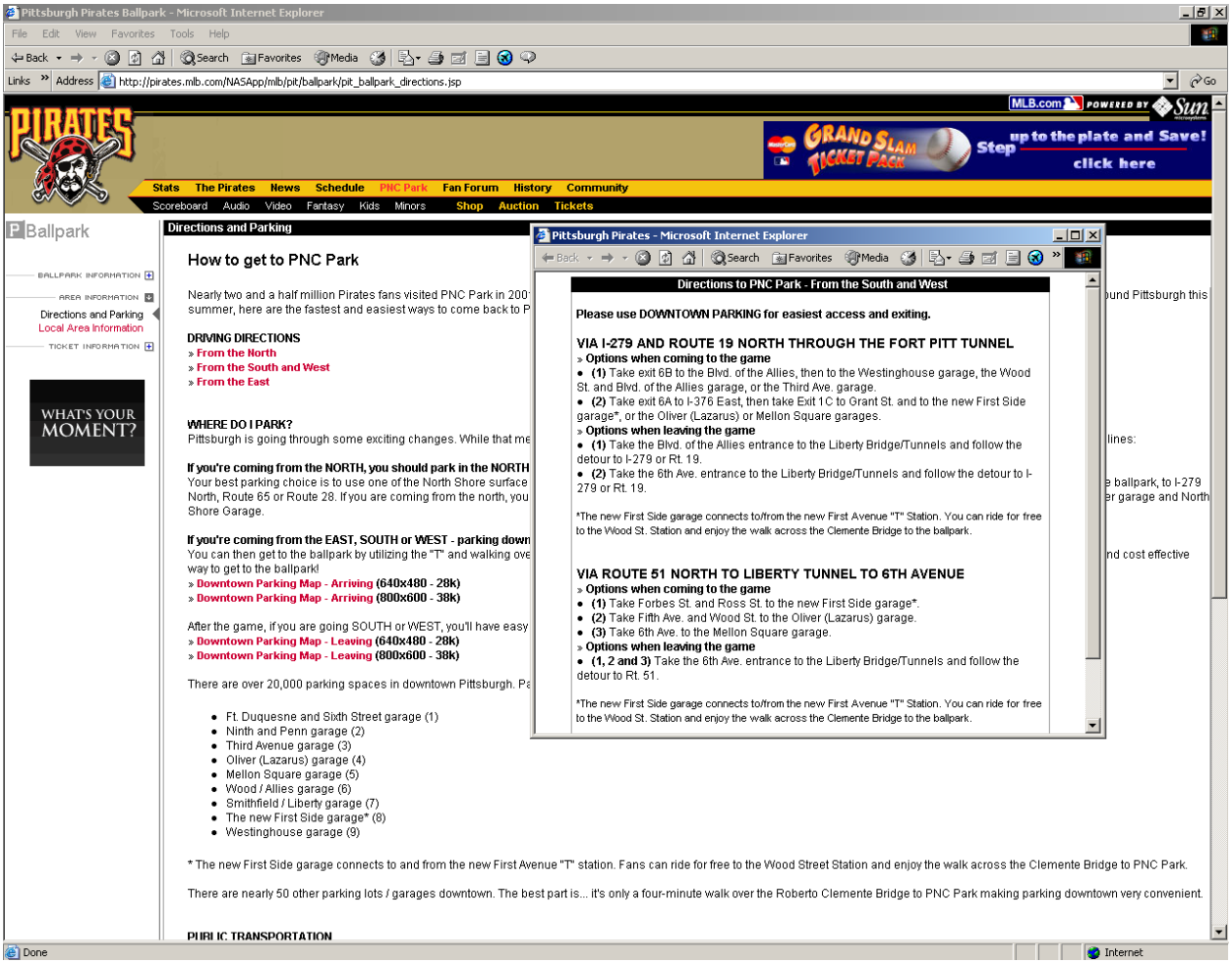
Source: www.rir.com

DTE ENERGY MUSIC THEATRE
CLARKSTON, MI



Source: www.palacenet.com

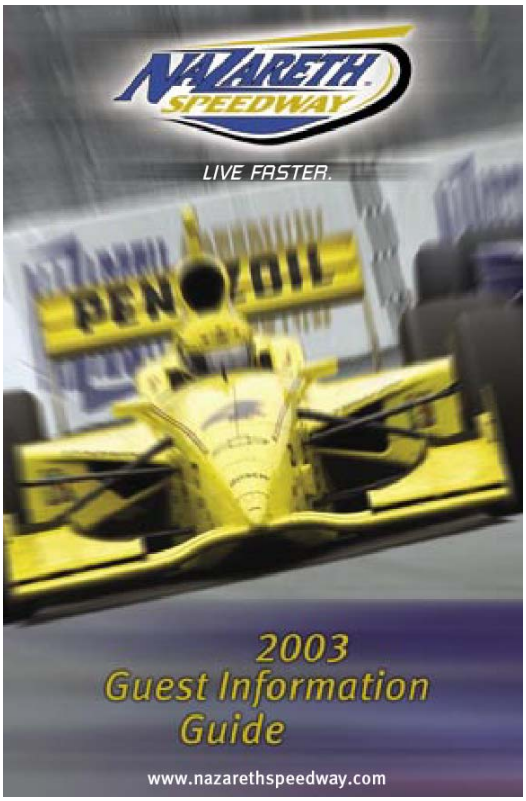
PNC PARK
PITTSBURGH, PA



Source: pirates.mlb.com

APPENDIX M
VENUE TRANSPORTATION GUIDES

NAZARETH SPEEDWAY
NAZARETH, PA



WELCOME TO "THE WORLD'S FASTEST MILE!"

Dear Guest:

In 2003, Nazareth Speedway is proud to bring back some of the most exciting racing in the country, including the series we've enjoyed watching compete at this historic one-mile oval for years – the IRL IndyCar series. We are extremely proud to welcome back native son Michael Andretti – and his new Andretti/Green Racing team. In addition, some of your old favorites, including Dario Franchitti, Tony Kanaan, Kenny Brack and Scott Dixon, will return to battle two-time IRL champion Sam Hornish, Jr., as well as new favorites Helio Castroneves, Al Unser, Jr., Sarah Fisher and Eddie Cheever, Jr. The IRL IndyCar series will be joined by the USAC Midgets, Sprints and Silver Crown events to create one of the most unique open-wheel racing weekends on the East Coast.

This season's lineup also includes the return of the NASCAR Busch series event, which features the rising stars of NASCAR vying to become the next Dale Earnhardt, Jr., Jamie McMurray or Greg Biffle - all of whom got their start at Nazareth Speedway. The popular NASCAR Featherlite Modified series will join the NASCAR Busch series on Sunday afternoon.

Nazareth Speedway could not continue to bring this great racing to the Lehigh Valley if not for the continued support and loyalty that you, our guests, have shown us throughout the years. As in the past, we are committed to providing the highest level of guest services throughout the 2003 race season. Please let us know how we are doing by sending an email to fans@nazarethspeedway.com. After all, many of the practices now in place are a direct result of your feedback.

We hope your visit to Nazareth Speedway is enjoyable and that we will see you again soon at our next event!

Best regards,

Craig E. Rust
President
Nazareth Speedway

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Nazareth Speedway's Fan Guide is published by Anthem Motorsports, Inc., Commerce Plaza, 7300 West 110th St., 7th Floor Overland Park, KS 66210, www.AnthemMotorsports.com, tel. 913-894-6923.

GETTING HERE

Nazareth Speedway is just a short trip from both Philadelphia and New York City. The routes offered below should serve as a general guideline only and are not necessarily the best routes from your area. Please consult a more detailed map for specific instructions from your area.

FROM HARRISBURG
Route 78 E • Exit 51; Route 22 E • Route 191 N

FROM THE NEW ENGLAND AREA
Route 84 W to Route 209 S • Continue to 33 S to Route 248 W • Route 191 S

FROM NEW YORK
Route 80 W to Route 287 S to Route 78 W to Route 33 N to Route 248 W • Route 191

FROM OHIO
Route 80 E to Route 33 S • Route 248 W • Route 191 S

FROM PHILADELPHIA
PA Turnpike (Northeast Extension 476 N) • Exit 33; Route 22 E to Route 33 N to Route 248 E

FROM POCONO AREA
Route 80 W to Route 33 S • Route 248 W • Route 191 S

FROM TRENTON
Route 31 N to Route 78 W to Route 33 N to Route 248 W to Route 191 S

TRAFFIC

The following traffic patterns are provided to assist you in traveling to and from Nazareth Speedway, in cooperation with the Pennsylvania Department of Transportation and state, local and area police agencies.

Please help us get you in and out of Nazareth Speedway as quickly and efficiently as possible by following the instructions of the law enforcement officers directing traffic. Also, please be patient and courteous to fellow race fans if delays occur. Most importantly, please drive safely and leave the racing to the pros on the track – we would like to see you back for another exciting weekend of racing at Nazareth Speedway.

TRAVEL TIPS

- Use recommended routes. The guest guide includes maps that diagram the inbound and outbound traffic patterns around Nazareth Speedway.
- Please follow the directions of police officers. They will do their best to ease the burden of delays that may be caused by increased traffic flow and the enhanced security policy at Nazareth Speedway.
- Make sure you have plenty of gasoline.

INBOUND TRAFFIC

Highway 191 – Northbound from U.S. 22: Traffic approaching from this direction will turn left onto Christian Springs Rd. to the best available parking lot. Only vehicles with the appropriate, valid credentials will be directed to either Gate 1 or Gate 2.

Highway 191 – Southbound: Traffic approaching from this direction will turn right onto Route 248 and into the best available parking lot. Only vehicles with the appropriate, valid credentials will be directed to either Gate 1 or Gate 2.

Highway 248 – Eastbound: Traffic approaching from this direction will turn right onto Georgetown Rd. and into the best available parking lot. Only vehicles with the appropriate, valid credentials will be directed to either Gate 1 or Gate 2.

Highway 248 – Westbound from Route 33: Traffic approaching from this direction will turn left onto Route 191 into the best available parking lot. Only vehicles with the appropriate, valid credentials will be directed to either Gate 1 or Gate 2.

OUTBOUND TRAFFIC

Gate 1 – Traffic will be directed South (right turn ONLY) on Highway 191.

Gate 2 – Traffic will be directed North (left turn ONLY) on Highway 191. Guests needing to travel south should turn right on Route 248 and proceed east to Interstate 33 south.

Gate 3 – Traffic will be directed East (right turn ONLY) on Route 248.

Gate 4 – Traffic will be directed West (left turn ONLY) on Route 248. Guests needing to travel north should proceed to Route 946 north or Route 512 north.

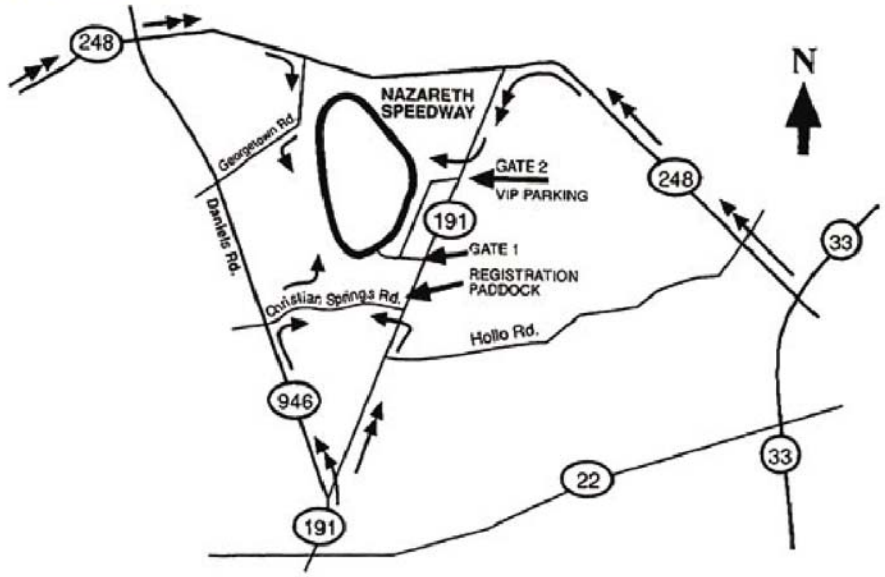
NAZARETH SPEEDWAY

WOULD LIKE TO THANK OUR CORPORATE PARTNERS

76 · Gatorade · Firestone Racing · Mid-America Golf Car Transport · Pontiac GMC Key · MBNA · Chevrolet · the Chateau Resort & Conference Center · Air Products · Lehigh Valley Hospital and Health Network · Yellow Book · Pontiac · Goodyear

FAN GUIDE 2003

INBOUND TRAFFIC MAP



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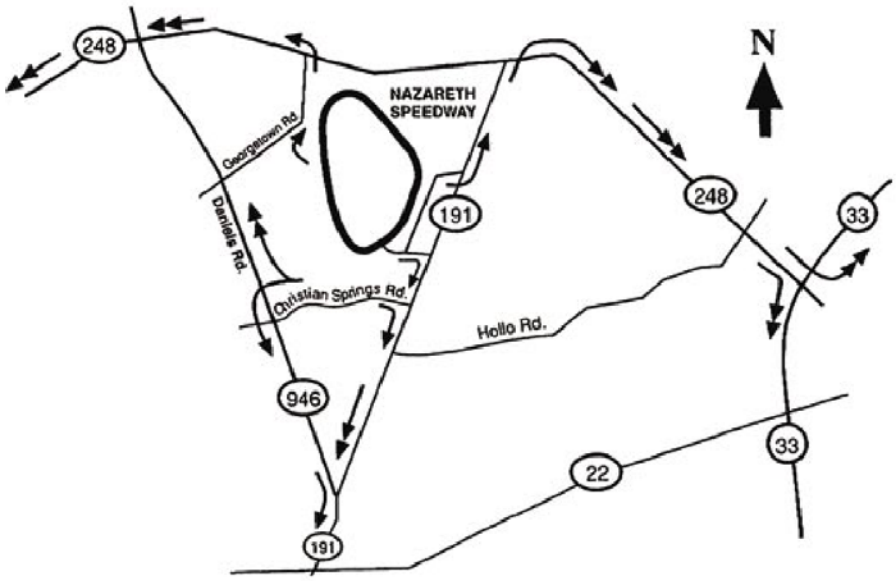
FAN GUIDE 2003

OUTBOUND TRAFFIC MAP



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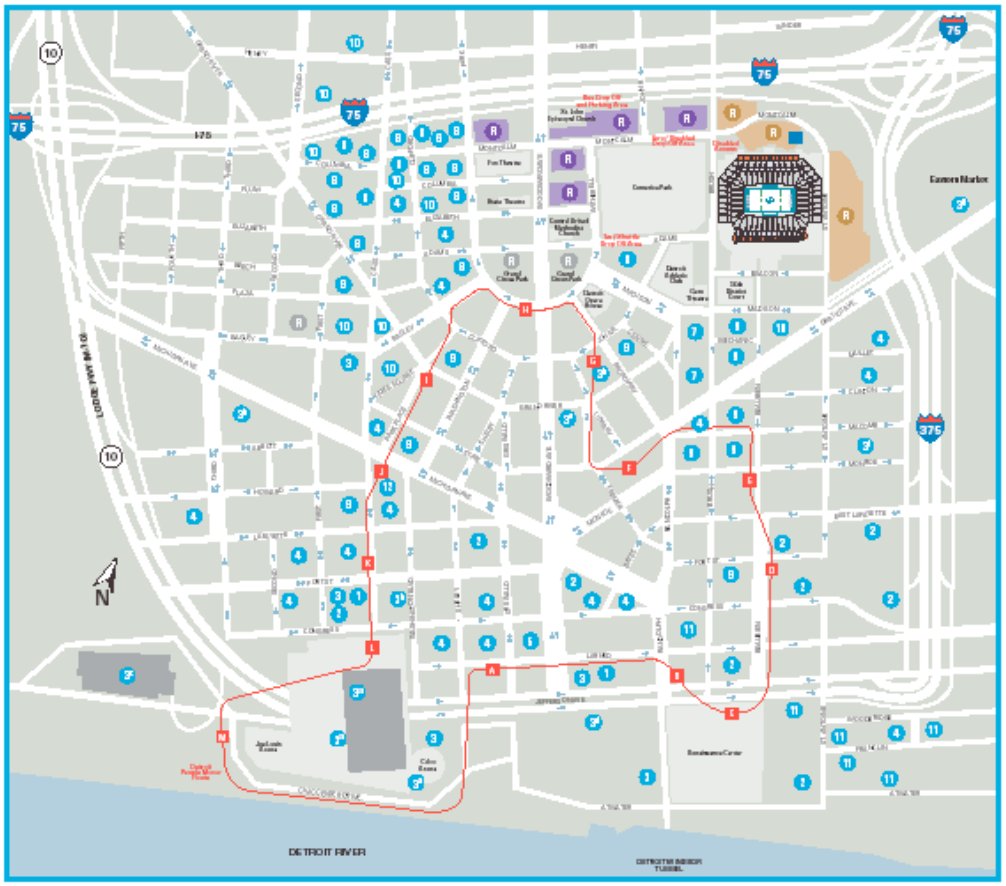
37

Source: www.nazarethspeedway.com

FORD FIELD
DETROIT, MI



2002 Ford Field Parking Map Legend

Ford Field is conveniently located adjacent to major freeways and thoroughfares. Approximately 30,000 parking opportunities are available within a 20 minute walk from Detroit's central business district to Ford Field. Please contact private off-site parking facilities listed here to reserve your parking space for Detroit Lions games.

Ford FORD FIELD

It's A Whole New Animal

Off-Site Parking Facilities

Lot No.	Facility Operator	Phone
1	Ampco System Parking	(313) 965-0483
2	Central Parking System	(313) 963-5839
3	*City of Detroit Municipal Parking	(313) 967-1612
4	Handy Parking	(313) 831-5236
	Mobile Parking	
	Woodward Parking	
5	HDC Partners, LLC	(313) 962-8300
6	JFR Services, Inc.	(586) 468-1664
7	Miller Parking	(313) 259-2434
8	Olympia Entertainment	(313) 471-3264
9	Park Rite, Inc.	(586) 784-1006
10	Prime Parking	(866) 962-7827
11	Renaissance Center Parking	(313) 567-3009
12	Second City Garage	(313) 963-4038

*To game day parking information on lots designated 3a - 3h, please call: 3a - (313) 529-3540, 3b - (313) 965-7275, 3c (313) 259-6340, 3d - (313) 877-8787, 3e - (313) 967-1831, 3f - (313) 961-4100, 3g - (313) 833-8154, 3h - (313) 224-8830

Reserved Parking

Lot	Designator
R	Suite Holder Parking
R	Club Seat Holder Parking

Detroit People Mover Stations

- A Financial
- B Millender Center
- C Renaissance Center
- D Bricktown
- E Greektown
- F Cadillac Center
- G Broadway
- H Grand Circus Park
- I Times Square
- J Michigan Avenue
- K Fort / Cass
- L Cobo Center
- M Joe Louis Arena

The material provided herein is informational only. Nothing contained herein should be interpreted as representation, warranty or guarantee of rates, availability or quality of services or any parking facility referenced on this map.

Source: www.fordfield.com

APPENDIX N
SAMPLE IMPLEMENTATION PLANS

INDIANA STATE POLICE
2002 BRICKYARD 400 - TABLE OF CONTENTS

TABLE OF CONTENTS

Source: Indiana State Police

INDIANA DOT
2002 BRICKYARD 400

INDIANAPOLIS TRAFFIC MANAGEMENT CENTER
INDIANA DEPARTMENT OF TRANSPORTATION
100 North Senate Avenue
Room N925
Indianapolis, Indiana 46204-2249
(317) 234-0448 *FAX: (317) 233-4662*
An Equal Opportunity Employer ● *www.trafficwise.org* ● *www.in.gov/dot*

FRANK O'BANNON, Governor
J. BRYAN NICOL, Commissioner

DATE: 1 August 2002

TO: All INDOT Units Assigned the Brickyard 400 Race Detail

FROM: Jay Wasson, ITS Operations Engineer
Operations Support Division

RE: Detail Specifics for Brickyard 400 Detail scheduled for Sunday, August 4, 2002

DETAIL OVERVIEW

INDOT through the Greenfield District based ITS program will conduct a race day special detail to facilitate the movement of persons to and from the Indianapolis Motor Speedway (IMS) via the Interstate System in Marion County, Indiana. The detail shall consist of the following elements:

- Traveler Information
- Incident Response & Mitigation
- System Monitoring (i.e. traffic conditions)
- Motorist Assistance
- Traffic Control, and
- Strategic Planning

DETAIL SCHEDULE

0530 - Command Center Opens at IMS
0600 - INDOT COMMAND operational at IMS Command Center
- AM Interstate Patrol Units 10-41
0630 - INDOT Maintenance to close I-74 Eastbound right lane at I-465
- AM Interstate Patrol Units to be in assigned zone beginning routine patrol.
0700 - Public Gates open at the Indianapolis Motor Speedway
1200 - PM Interstate Patrol Units 10-41
1300 - NASCAR Winston Cup Driver Introductions
- INDOT Maintenance to remove I-74 lane closure
1330 - Start of Brickyard 400 (160 laps, 400 miles)
- AM Interstate Patrol Units released from assigned patrol zones and permitted to return to Indianapolis Sub.
1400 - AM Interstate Patrol Units 10-42
1500 - INDOT maintenance to stage post-race traffic control equipment
1545$^{\alpha}$ - All units assigned to the post-race detail are to be in their assigned locations. (Lap 120 will be the target.)
1800 - Public Gates Close and Indianapolis Motor Speedway
1830$^{\alpha}$ - INDOT COMMAND releases operational control to Indianapolis Traffic Management Center
1930$^{\alpha}$ - PM Interstate Patrol Units released from assigned patrol zones and permitted to return to Indianapolis Sub.
2000$^{\alpha}$ - PM Interstate Patrol Units and any other 10-41 units for the detail 10-42

[α] Times may vary due to variability in race duration.

UNIT ASSIGNMENTS

Name	Unit	Assignment	Radio Number	10-41	10-42
Holder, Don	38-30	PM Interstate Patrol	38-30	1200	2000
Howe, David	38-41	AM Interstate Patrol	38-41	0600	1400
Miller, Herb	38-22	PM Interstate Patrol	38-22	1200	2000
Newland, Mark	X-10	PM Interstate Patrol (w/ 38-30)	38-30	1200	2000
Roquet, Glenn	38-7	Command Center – IMS	INDOT COMMAND	0530	1830(?)
Silcox, Brian	38-40	AM Interstate Patrol	38-40	0600	1400
Wasson, Jay	38-1	Detail Coordinator	38-1	0530	1830(?)
Wuertz, Steve	X-9	Command Center – IMS	INDOT COMMAND	0600	1800

DETAIL SPECIFICS

- All Hoosier Helper FSP Units are assigned to the race day detail are to patrol the West Leg of I-465 from I-70 (Exit 9) to 56th Street (Exit 19). If traffic conditions dictate, patrol areas may be expanded at the discretion of the IMS Command Center.
- The IMS Command Center console will be known as INDOT Command for all radio traffic. All normal Hoosier Helper to Base radio traffic with the IMS Command Center is run through the ***TMC DISPATCH*** talkgroup except:
  1. The Indianapolis TMC shall be contacted for all private tow requests.
  2. The Indianapolis TMC shall be contacted for all abandoned vehicle log interactions.
- All non-critical van-to-van radio traffic should be communicated on ***DTAG*** unless the conversation relates to an active incident in which everyone on the Primary Talkgoup benefits from your insightful dialog. ☺
- During the pre-race and post-race traffic pattern, Hoosier Helpers are to advise INDOT command as to traffic flow conditions on the mainline and interchange ramps in regular intervals. The IMS Command Center will be using maps with the 2/10th Reference Markers, so use the 2/10th Reference Markers when communicating this traffic information.
- Units assigned the PM Interstate Patrol Detail are to load as many additional cones into their commissions as possible. Based on past experience, additional traffic control may be required during the post-race traffic pattern.
- Interstate Patrol Units that encounter "ticket scalpers" and/or "road side salespersons" are to do the following:
  1. Advise INDOT command as to the location and description of the subject(s).
  2. Approach the subjects and advise them that pedestrian traffic on the interstate is illegal. While we do not have enforcement powers, we can most certainly contact someone who does. This enforcement officer will not be lenient if the subject(s) do not comply with our warning.
  3. Advise INDOT command as to the disposition of your conversation.
  4. Monitor subject(s) actions as you and other units continue routine patrol of the area.

  NOTE: While the City of Speedway does issue permits for these types of activities, the Interstate Right-of-Way is NOT within the city limits. Therefore, any permit that is flashed by the subject(s) is null and void on the Interstate!!

  REPORT BILLERGENT BEHAVIOR TO THE TMC COMMAND IMMEDIATELY, IF YOU FEEL THAT YOUR LIFE OR THAT OF OTHERS IS THREATENED!!

- A copy of the official traffic pattern map is attached to this memorandum for your information.
- State Police units assigned exclusively to the race detail will operate on 52-OPS 2 outside of the track and 52-OPS 1 inside of the track. Due to the Hoosier Helper radios not currently having 52-OPS 1 or 2 programmed, these talkgroups can be monitored in units with onboard scanners as follows:
  - System → District 52 Tower
  - 52 OPS 1 → Talkgroup ID 16080
  - 52 OPS 2 → Talkgroup ID 16112

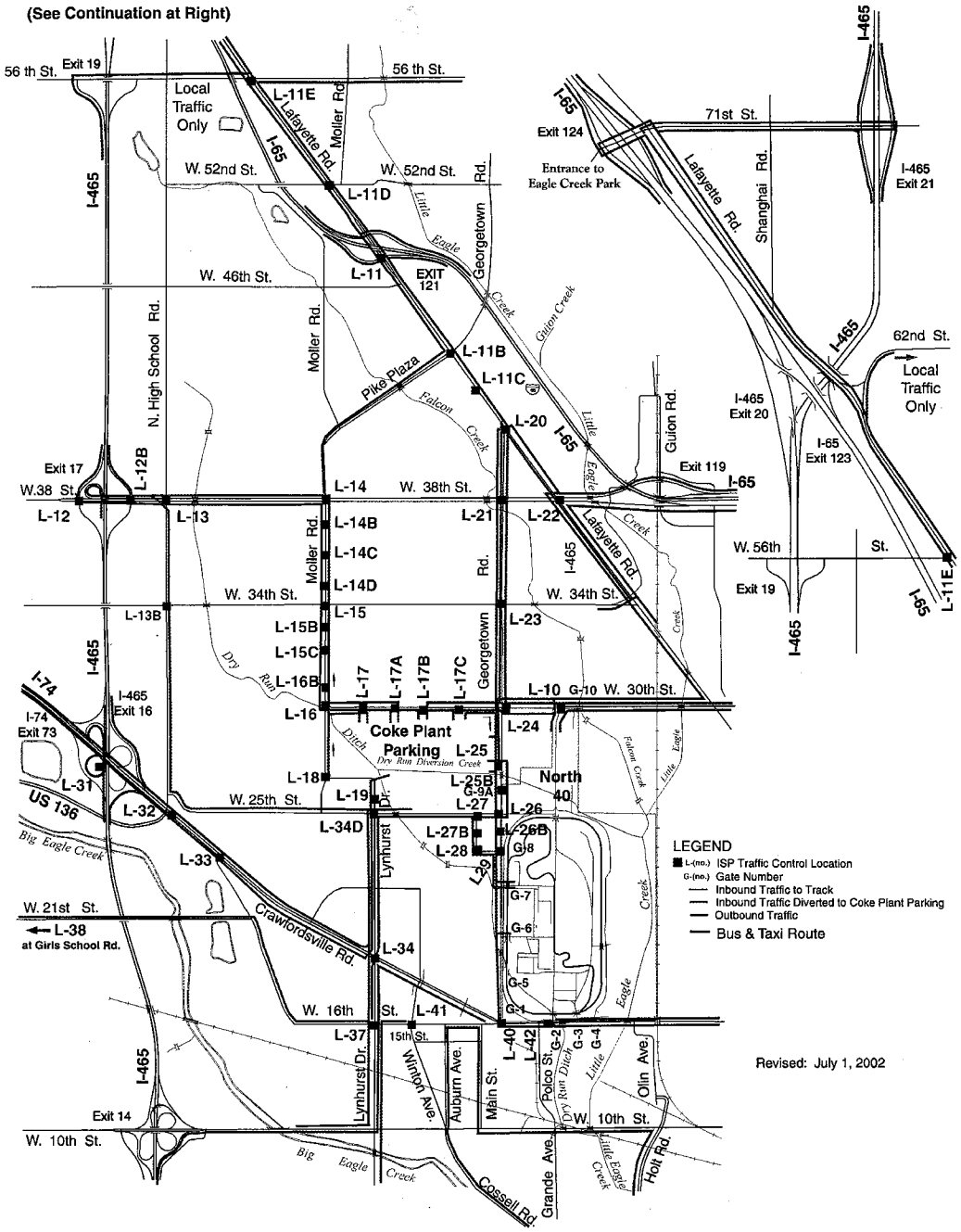
  District 52 units assigned to routine district duties will continue to operate on 52 Dispatch

SPECIAL ASSIGNMENTS

- 38-30 and X-10 are to move the temporary DMS from Westbound Crawfordsville Road east of High School Road to eastbound I-465 east of I-65 on the south side of Indianapolis near mile marker 52.8. This DMS will be used to advise motorists to watch for stop or slowed traffic ahead due to the road work and associated traffic congestion on I-74 east of I-465.

Source: Indiana Department of Transportation

ISP- Indianapolis Motor Speedway Traffic Control Map



Federal Highway Administration
U.S. Department of Transportation
400 Seventh Street, S.W. (HOTM)
Washington, D.C. 20590
Toll-Free “Help Line” 866-367-7487
www.ops.fhwa.dot.gov

Publication No. FHWA-OP-04-010
EDL Document No. 13883

NHI Training Course No. 133099
Managing Travel for Planned Special Events
Publication No.: FHWA-NHI-03-120

Appendix 9

Guidelines for Using Parking as an Economic Development Strategy

Appendix 9. - Guidelines for Using Parking as an Economic Development Strategy

The following general guidelines have been developed as a checklist for consistently evaluating potential development projects and the use of parking as a development incentive within the context of advancing defined strategic goals.

General Guidelines

1. Parking can be a very powerful development incentive but must be applied in a fair and consistent manner that advances the larger community strategic goals. The following issues are examples of the type of criteria that we recommend as part of the assessment for either committing a significant number of existing parking resources or the development of future parking assets as an element of a public/private partnership project:

    a. Does the proposed development contribute to economic health of the downtown/community?
    b. Does the proposed development project include prioritized or highly valued development goals or program elements supported by the City?
    c. Are the proposed land-uses, or combination of land-uses, appropriate for the specific area?
    d. Is the proposed development project in alignment with the downtown master plan and/or strategic plan?
    e. Does the proposed development project incorporate special elements valued by the City, the downtown association or other appropriate groups/plans? If yes, specify.

2. Has the City Planning Department reviewed and endorsed the proposed development plan?

    a. Does the proposed development project create any unusual or unacceptable parking or traffic impacts?
    b. Does the proposed development project create any other conditions, or impacts that cause concerns?
    c. Does the proposed development project require any variances to applicable zoning codes or special district requirements?

3. Is the developer willing to develop new parking assets in accordance with City's parking structure design guidelines in order to ensure compliance with downtown development standards and parking structure design best practices?

4. Has the initial economic development impact of the project been estimated?

    a. New jobs for downtown?
    b. Jobs retained in downtown?
    c. Increase in property taxes/TIF contributions?
    d. Estimated increase in sales tax revenue (if applicable)?
    e. Stimulation of additional development?

f. Stimulation of support jobs?
g. Support of existing retail, restaurant and other existing service providers?

5. Is participation in this development project appropriate and consistent with the economic development goals of the City/downtown?

Parking System Support/Program Management

1. Will this project generate additional parking revenue to support or contribute to the City's parking program?

   a. If yes, specify:
      i. Estimated monthly spaces contracted: _____
      ii. Estimated additional annual monthly revenue: _____
      iii. Estimated transient revenue per month: _____
      iv. Special event revenues: _____
      v. Other annual revenue: _____

2. Does this proposed development project create any new or unusual operating expenses that might negatively impact the City parking program?

3. Are there opportunities for the municipal parking program to operate new parking capacity for a management fee?

   a. Is this desirable relative to this specific project?

4. Is the net financial impact of this project projected to be positive?

5. Are the activities proposed, relative to participation in this development opportunity, in compliance with City parking program bond covenant requirements/restrictions?

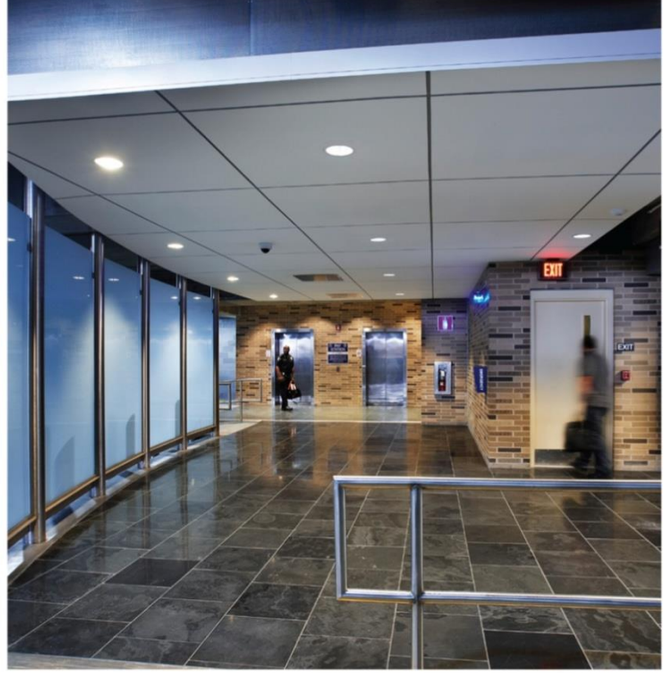
6. Are there opportunities for partnership/collaboration with the developer or property management firms relative to other downtown parking program goals?

   a. Possible public use of spaces after typical weekday work hours, weekends, holidays, etc.?
   b. Possible public use of spaces after typical weekday work hours for special events?

7. Does this development project create any special conditions that undermine the financial or market position of the City parking program?

Strategy

Restoration

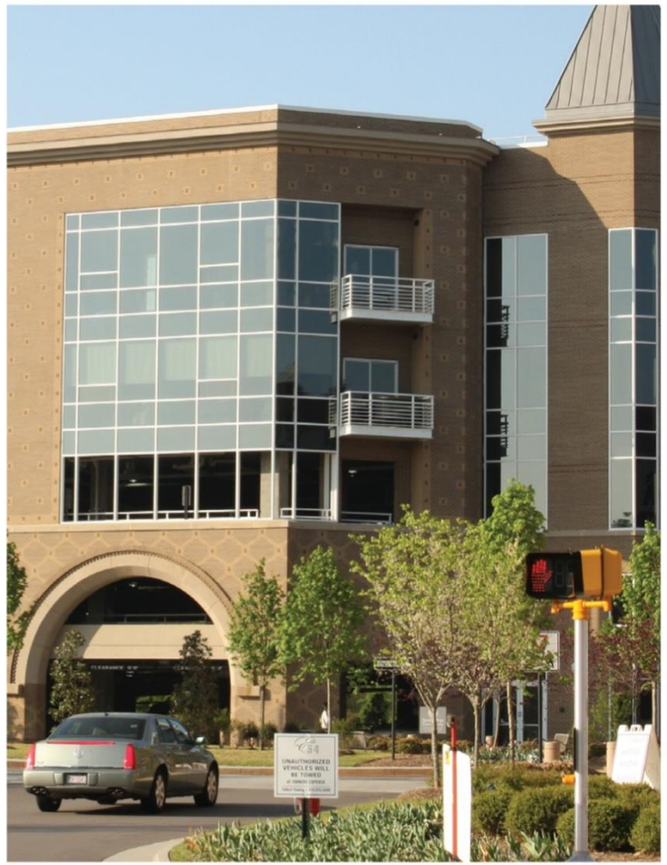


Operations

Technology

Design

Success



PARKING | The Next Level

Cleveland County
City of Norman

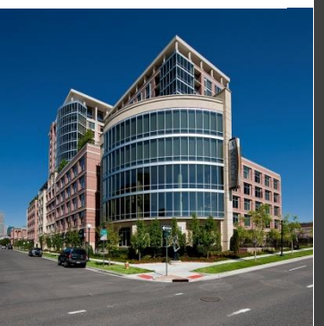
Parking Strategic Plan

Appendix 11.

PARKING | The Next Level

PARKING MANAGEMENT & DESIGN - **Best Practices**

Kimley»Horn



Introduction/Overview

This collection of parking management and design “best practices” has been compiled over a number of years and continues to evolve as the parking industry evolves.

Our goals in the development and organization of this document were to provide a comprehensive categorization of parking planning, management and design areas to make finding specific best practices easier. As is often the case when trying to categorize a wide range of items there instances where one item might legitimately be placed in multiple categories.

As this collection has grown, we have expanded our thinking on exactly what to include. For example, in the category of “Sustainable Parking Design & Management Strategies” we chose to include some concepts that speak more to potential future applications. While technically not “best practices”, they do illustrate new ideas and approaches that can inspire creative thinking.

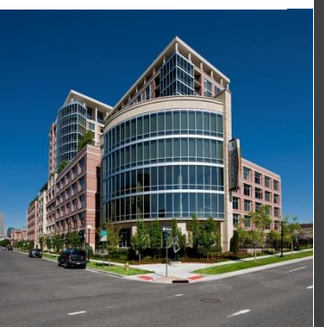
We know of no parking/transportation program anywhere that has adopted all of these concepts and management strategies. It is our hope that this tool will provide the City with a wealth of ideas to stimulate program development.

Kimley»Horn

PARKING | The Next Level

PARKING MANAGEMENT & DESIGN - **Best Practices**

Kimley»Horn



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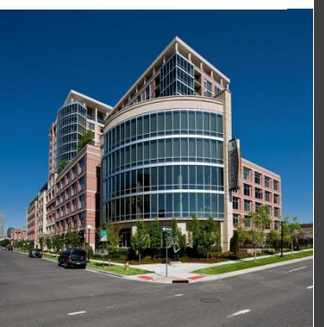
Kimley»Horn



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PARKING MANAGEMENT & DESIGN - **Best Practices**

Kimley»Horn

Ch.

1

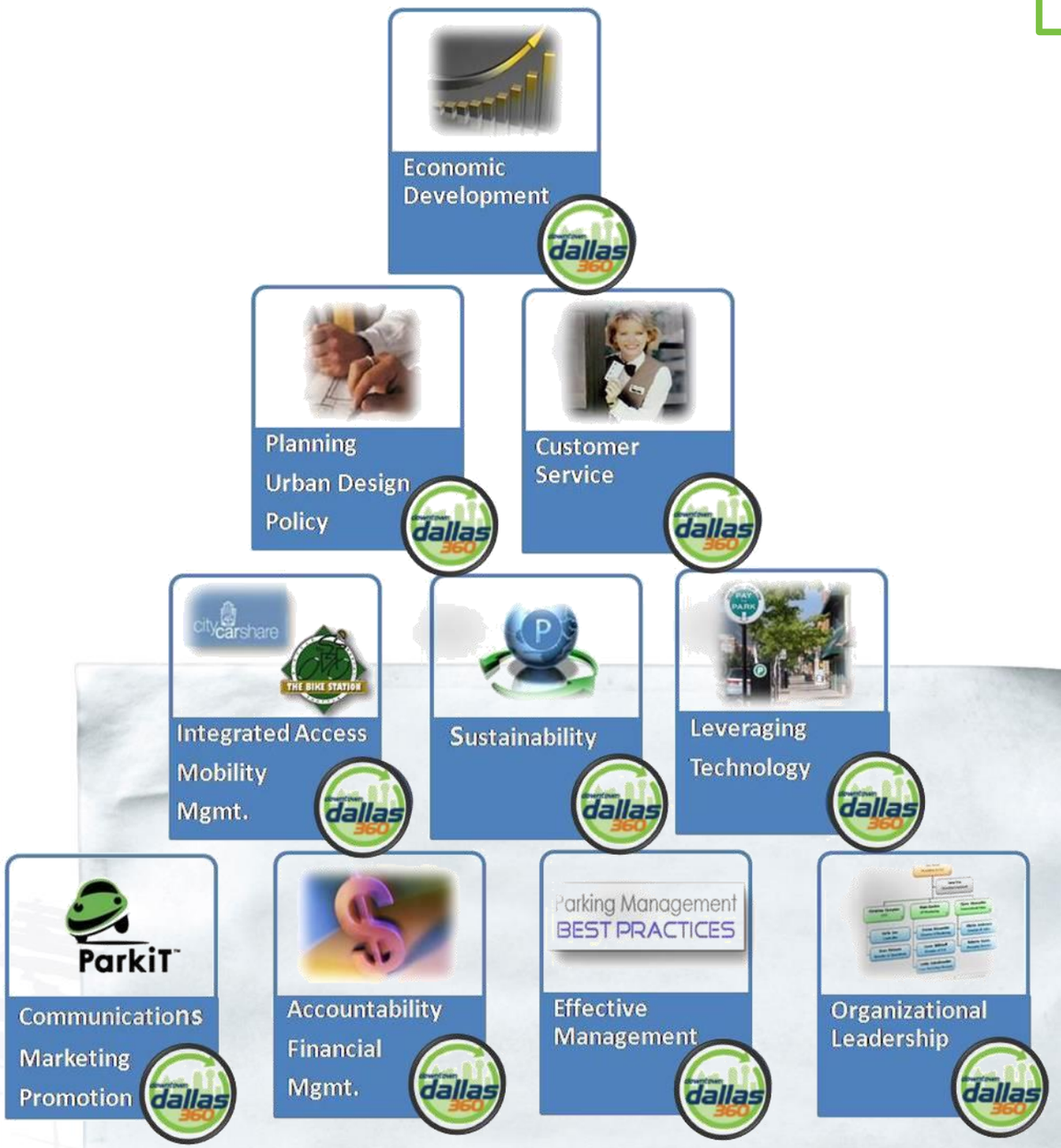
A Comprehensive Approach to Program Development

Guiding Principles

Creating a comprehensive set of "guiding principles" is the first step in creating a strategic parking plan for your organization.

ex.

- Guiding Principles form the strategic framework of a program
- Within a parking strategic plan, specific action items are organized by the larger "guiding principle categories".
- In this way, by working the action plan, you will remain true to the vision, mission and core values of the strategic plan which was developed with significant stakeholder involvement.



Kimley»Horn

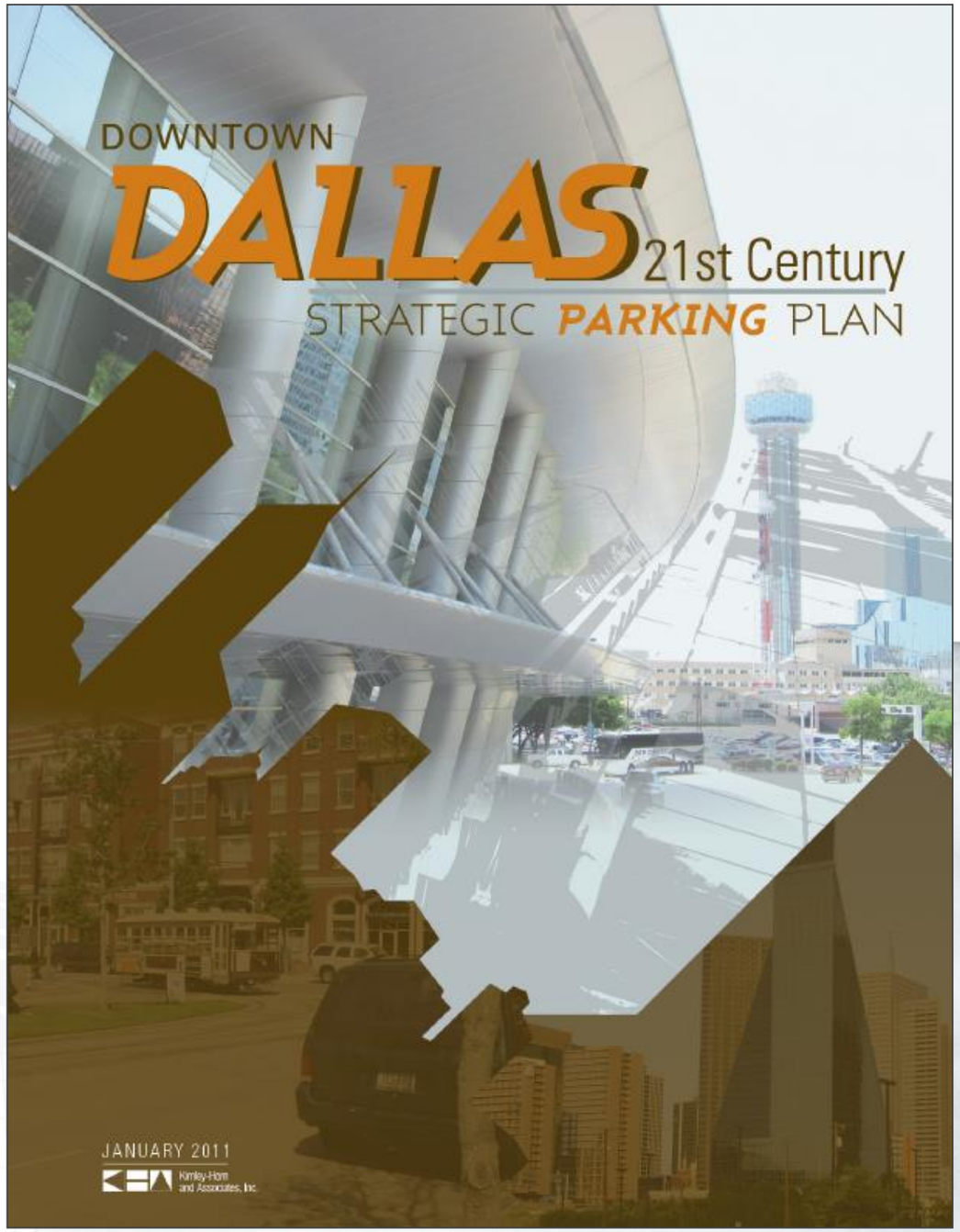
Parking Strategic Plans

A characteristic of “Best in Class” parking programs is that they have developed a *Parking Strategic Plan* to define the program’s vision, mission and work plan.

One key to success is the degree to which programs actually “work the plan”.

ex.

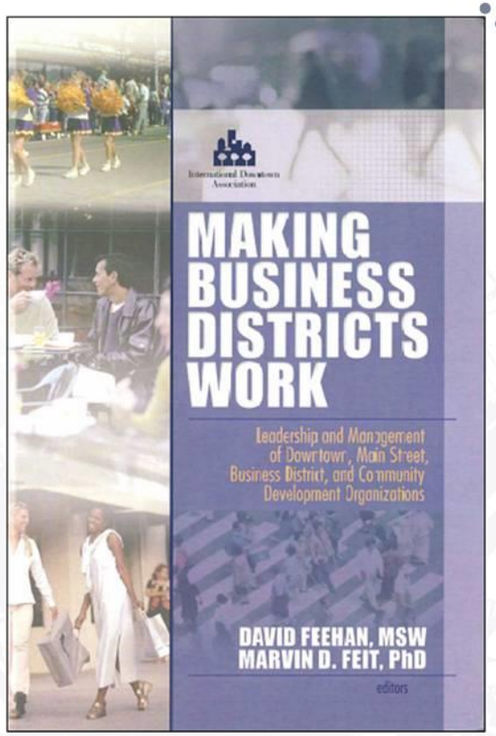
- The strategic plan helps set program priorities
- Builds consensus on program direction
- Defines funding priorities
- Informs staffing development
- Connects the program of work with related community interests
- Provides a roadmap for future program development



20 Characteristics of Effective Parking Programs

The parking chapter of the book *"Making Business Districts Work"* reviews what the author considers to be the "20 Characteristics of Best-in-Class Parking Programs". Taken as a whole these characteristics form the foundation for a comprehensive parking management program.

ex.



- Clear Vision and Mission
- Parking Philosophy & Guiding Principles
- Strong Planning
- Community Involvement
- Organization
- Staff Development
- Safety, Security and Risk Mgmt.
- Communications
- Consolidated Parking Programs
- Financial Planning
- Effective Parking Management
- Operational Efficiency
- Facilities Maintenance & Asset Protection
- Use of Technology
- Parking System Marketing
- Customer Service Programs
- Special Events Parking
- Effective Enforcement
- Parking & Trans. Demand Mgmt.
- Awareness of Competitive Environment

PARKING | The Next Level

PARKING MANAGEMENT & DESIGN - **Best Practices**

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2

Program Organization

Vertical Integration

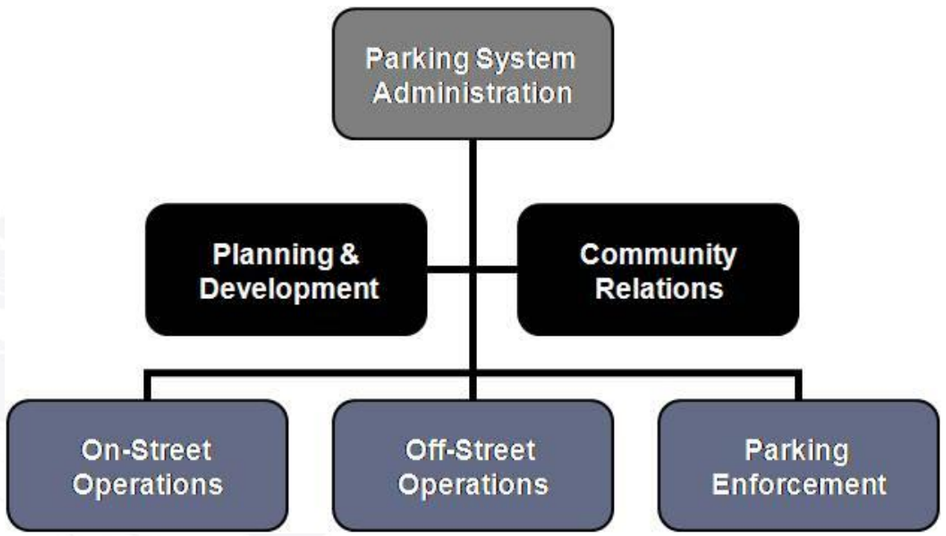
The single most important element of a parking program's organizational structure is the principle of "vertical integration".

- The most successful parking program organizational models include:
  - Parking Authorities
  - Vertically Integrated City Departments
  - Business Improvement Districts
  - Parking Management Districts
  - The Professional Services Model
- At a minimum the following three areas are essential for a vertically integrated parking program:
  - Off-Street Management
  - On-Street Management
  - Parking Enforcement

ex.

- Beyond the three primary functional areas (on-street, off-street and enforcement), the other recommended primary areas include: administration, planning/development and community relations.

  Other key areas might include: contract administration, finance/audit and special projects, depending on the program.

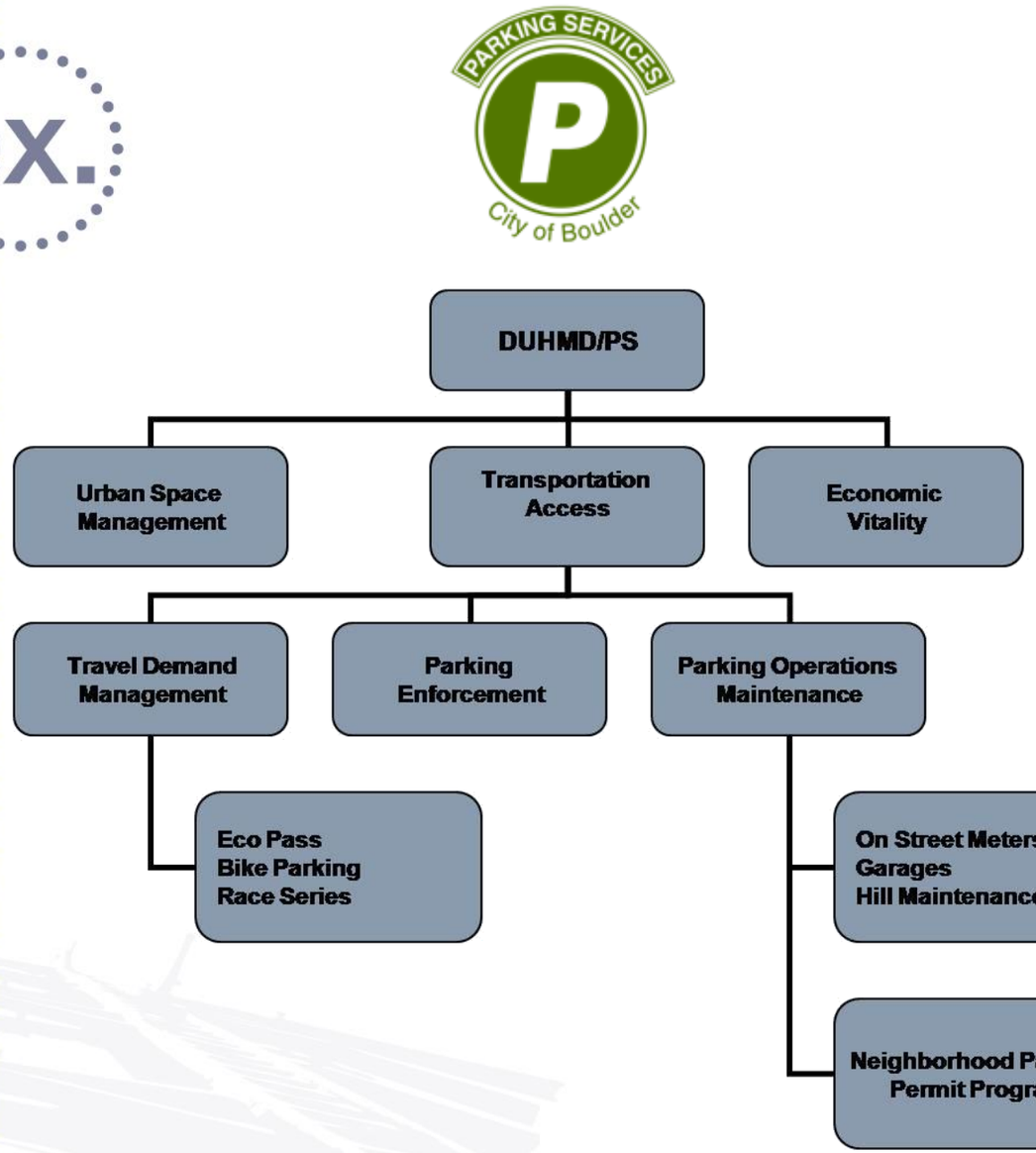


Non-Traditional Organizational Models

The City of Boulder has a unique combination of integrated municipal services within the Downtown and University Hill Management Division & Parking Services (DUHMD/PS).

» Beyond the basic parking program integration of off-street management, on-street management and parking enforcement, this program has a broader organizational mandate including urban space management, transportation and economic vitality.

ex.



"Dual Mission Philosophy"

Some of the most effective and progressive parking programs in operation today are those being managed by Business Improvement Districts, Downtown Development Authorities, Urban Renewal Agencies, etc.

- One of characteristics that helps make these organizations so successful is what we refer to as the "Dual Mission Philosophy".
- The primary goal of the agency is to create a revitalized downtown. Because of this, parking is managed as a tool to support this primary goal.
- The result is that different decisions are made relative to parking than those made in traditional city parking departments.

ex.

Examples of high quality parking programs that fit into this category include:

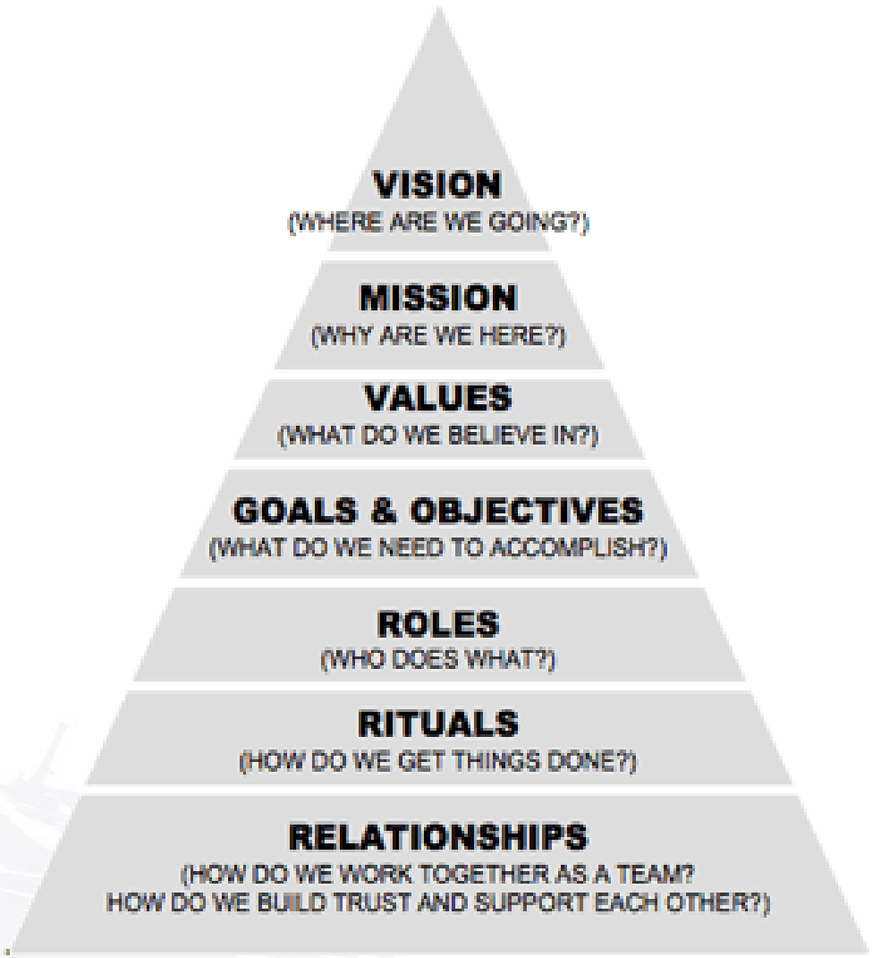
- The City of Boulder, Boulder, CO
- The Capital City Development Corporation – Boise, ID
- The Ann Arbor Downtown Development Authority – Ann Arbor, MI
- The Anchorage Community Development Authority – Anchorage, AK
- Downtown Tempe Community, Inc. – Tempe, AZ
- The Cedar Rapids Downtown District – Cedar Rapids, IA
- Charlotte CENTER CITY Partners, - Charlotte, NC
- Missoula Parking Commission – Missoula, MT

Organizational Development Pyramid

The organizational development pyramid succinctly defines the major organizational issues that any program should consider.

- **The primary questions to be answered include:**
  - Where are we going?
  - Why are we here?
  - What do we believe in?
  - What do we need to accomplish?
  - Who does what?
  - How do we get things done?
  - How do we work together as a team?

ex.



PARKING | The Next Level

PARKING MANAGEMENT & DESIGN - **Best Practices**

Kimley»Horn

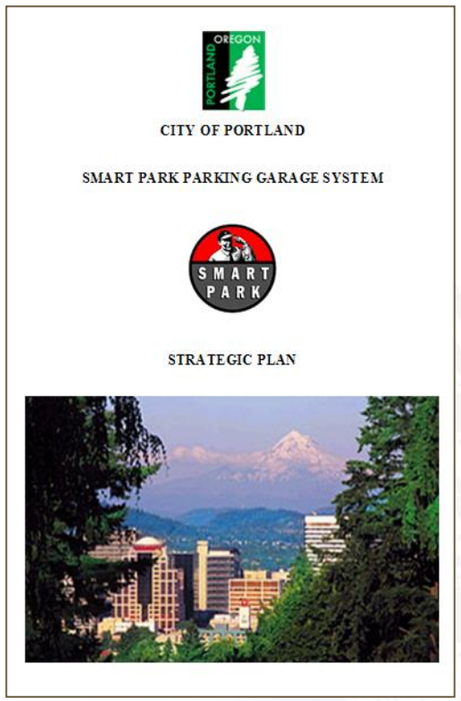
Ch.

3

Parking Planning

Alignment with Community Transportation and Strategic Plans

"Best in Class" programs typically have developed parking specific strategic or community access strategic plans that are aligned with larger community transportation planning initiatives.



ex.

» Strategic plan action items include:

- Exploration of alternative management methodologies to enhance customer service
- Evaluation of new parking technologies
- Forming of partnerships with community organizations
- Generating facilities development plans
- Evaluating the impact of related transportation resources
- Undertaking survey research to identify customers perceptions regarding parking availability and pricing

Guiding Principles

Development of a set of parking system "Guiding Principles" is a good tool for setting and communicating program goals and objectives to both staff and community stakeholders.

» "Guiding Principles" are not intended to replace policies and procedures, rather, they define the goals and objectives that ultimately define the character of the parking department.

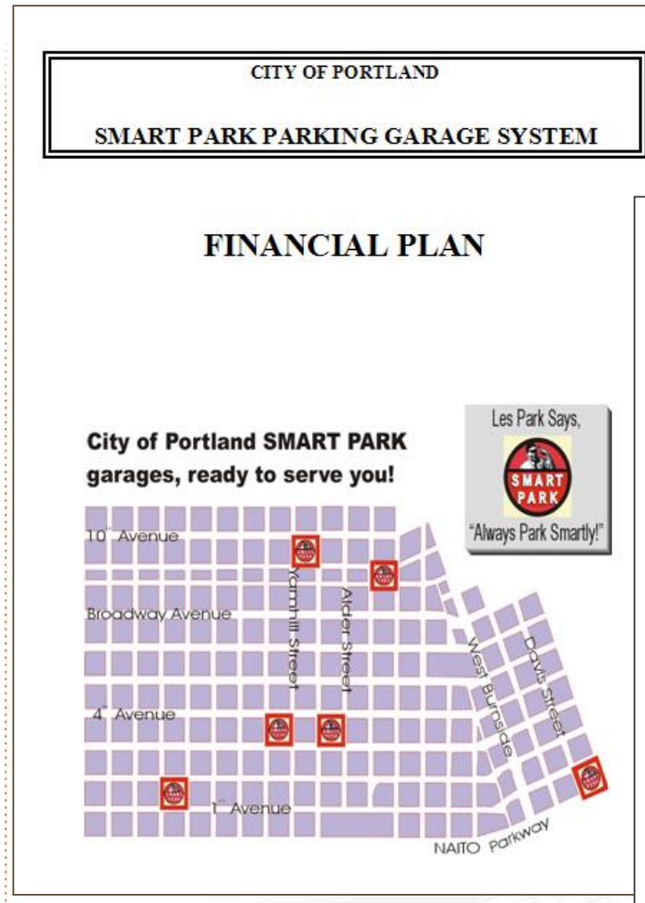
ex.

» Guiding Principles typically cover:

- Mission Statement / Statement of Purpose
- Operations/Funding Strategies
- Community Relationships
- Responsibility for Parking Operations
- Rate Setting Guidelines
- Options for Allocating/Procuring Parking
- Inclusion of Parking in Strategic and Master Planning Processes
- Procedures for Managing Losses of Parking Supply (both temporary and long-term)
- Definition and Communication of Parking Rules and Regulations
- Enforcing and Adjudicating Parking Rules and Regulations
- Defining Parking Facility Maintenance Responsibilities
- Special Event Parking
- Budgeting and Planning Cycles

Financial Plans

"Best in Class" programs typically have developed parking specific financial plans.


CITY OF PORTLAND

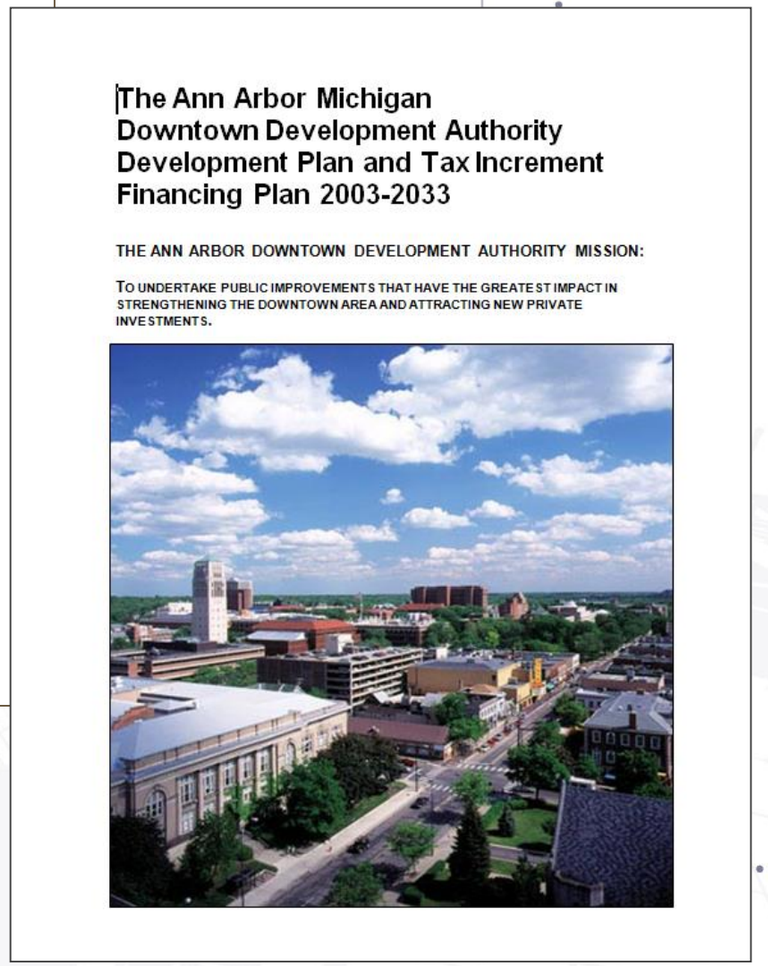
SMART PARK PARKING GARAGE SYSTEM

FINANCIAL PLAN

City of Portland SMART PARK garages, ready to serve you!

Les Park Says, "Always Park Smartly!"

10th Avenue
Broadway Avenue
4th Avenue
1st Avenue
Yamhill Street
Alder Street
West Burnside
Davis Street
NAITO Parkway


The Ann Arbor Michigan
Downtown Development Authority
Development Plan and Tax Increment
Financing Plan 2003-2033

THE ANN ARBOR DOWNTOWN DEVELOPMENT AUTHORITY MISSION:

TO UNDERTAKE PUBLIC IMPROVEMENTS THAT HAVE THE GREATEST IMPACT IN STRENGTHENING THE DOWNTOWN AREA AND ATTRACTING NEW PRIVATE INVESTMENTS.

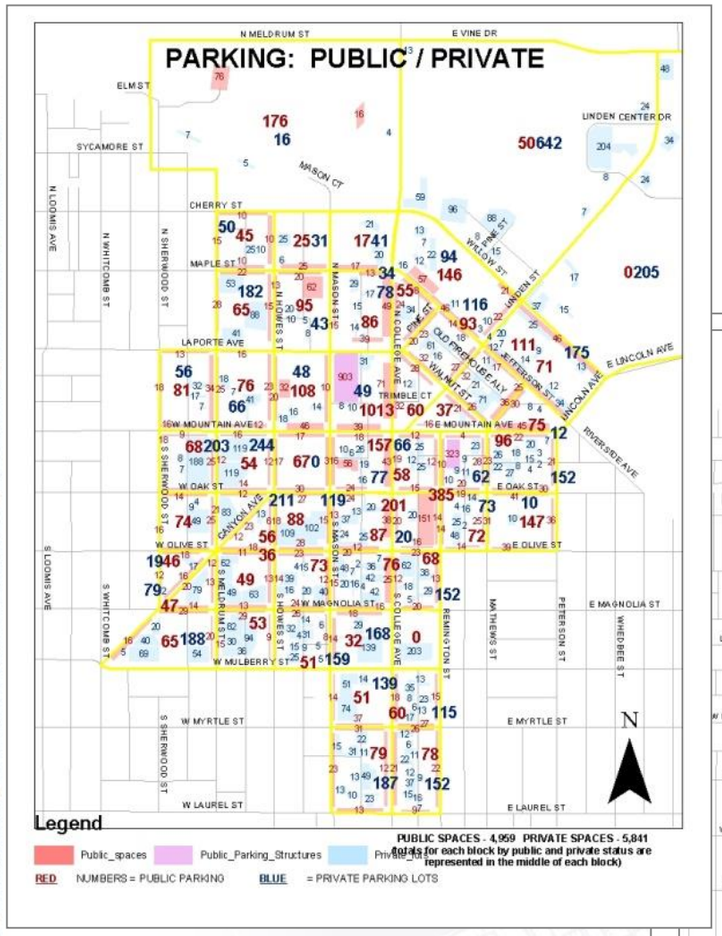
ex.

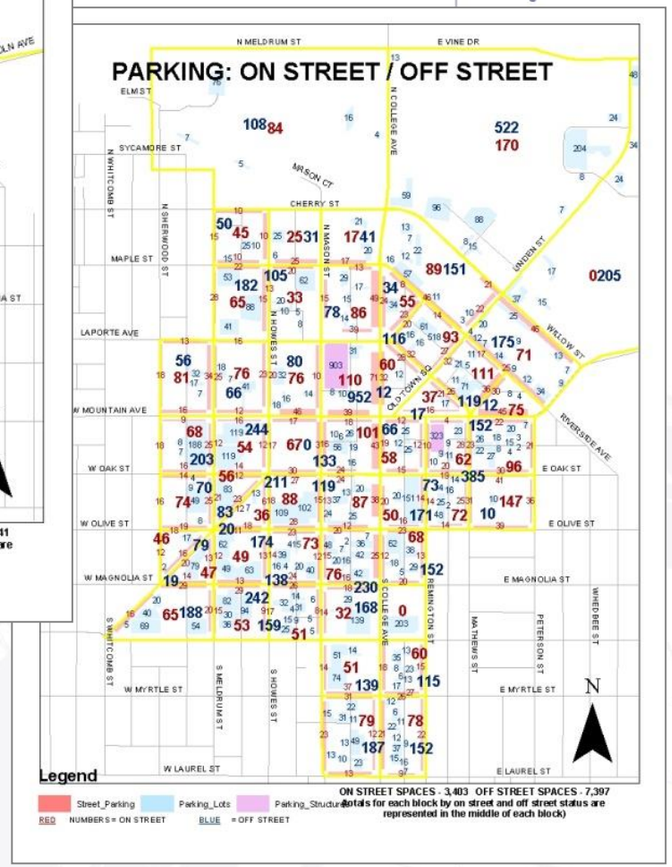
» Sample Financial Plan Table of Contents

- Introduction
- Background
- Planning and Policy Framework
- Operational Objectives
- Fund Balance and Reserve Policy
- Policies Regarding Uses of Parking Revenues
- Debt Policy
- Rates Policies
- Annual Updates

Parking Inventories

A basic element of effective parking program management is maintaining an up-to-date parking inventory.





ex.

- Parking inventories should be kept up to date on an on-going basis.
- Supply additions and losses should be tracked along with the dates spaces come into or out of service.
- It is extremely useful to also track land-uses and square footages.
- Parking supply should be subdivided by type of spaces.
  - On-Street vs. Off-Street
  - Public vs. Private
  - Surface lot vs. Structured

Supply/Demand Analysis

Periodic assessments of parking supply/demand are critical to effective parking system planning.

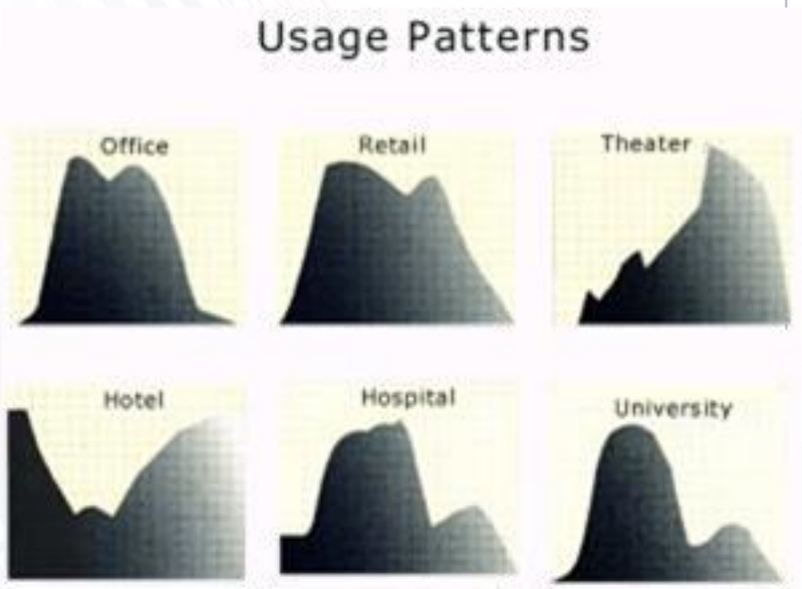
- Documenting current parking adequacy, typically on a zoned basis, is the first task in this process.
- This is followed by analyzing potential changes in parking supply conditions and future development projects.
- Projections of future parking demand and adequacy are typically developed based on proposed land-use changes or by analyzing specific development initiatives.

ex.

Shared Parking Model

Shared parking can have a significant impact on mixed-use development parking requirements. Combining certain land uses results in a demand for parking spaces that is less than the demand generated by separate, freestanding developments of similar size and character.

Having a community adopted shared parking model as part of the local parking requirements is a recommended best practice.



ex.

- Shared parking is defined as parking space that can be used to serve two or more individual land uses, without conflict or encroachment
- The opportunity to implement shared parking is the result of two conditions:
  - Variations in the peak accumulation of parked vehicles as a result of different activity patterns of adjacent or nearby land uses (by hour, by day, by season).
  - Relationships among land use activities that result in people's attraction to two or more land uses on a single auto trip to a given area or development.

On-Street Occupancy

Documenting on-street parking occupancy is another effective tool to help you better understand and manage your parking resources.

- Routinely tracking on-street parking occupancy and documenting the results graphically provides valuable management data.
- Often there is adequate parking supply despite a wide-spread perception that the parking supply is inadequate.
- Documenting the true occupancy rates are the first step to effectively resolving parking problems (real or perceived).

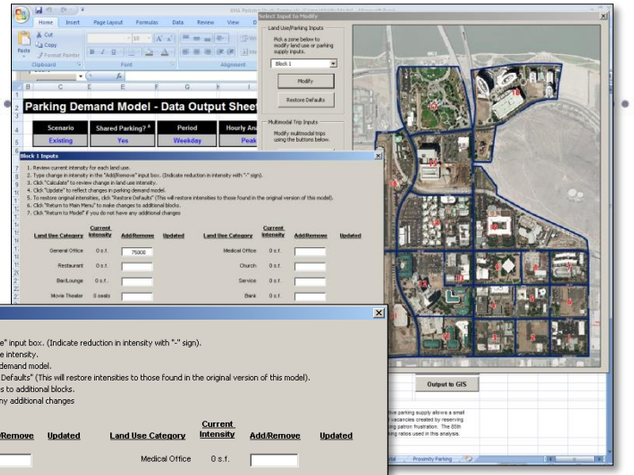
ex.

Parking Demand Model

Kimley-Horn has developed a model to help our clients keep parking inventory, utilization, land-use and parking adequacy data up to date.

» This dynamic toll is linked to Arc/GIS systems to provide an even more effective tool for local governments and institutions.

ex.



Parking Demand Model - Data Output Sheet (Weekday Analysis)

Scenario	Shared Parking? [A]	Period	Hourly Analysis		Event
Existing	Yes	Weekday	Peak		Panther & Bobcat Games

Zone	Peak Parking Demand [B]	Parking Supply [C]	Parking Supply Surplus [D]	Available Proximity Parking [E]	Adjusted Parking Supply [F]	Net Parking Surplus/Deficit [G]
Zone A	224	614	390	0	224	0
Zone B	3,348	2,185	-1,163	409	2,594	-754
Zone C	1,791	1,447	-344	103	1,550	-242
Zone D	86	291	205	0	93	7
Zone E	16,351	1,539	-14,812	82	1,621	-14,730
Zone F	1,130	806	-324	0	806	-324
Zone G	239	235	-4	4	239	0
Zone H	2,023	1,046	-977	60	1,106	-917
Zone I	5,008	1,709	-3,299	755	2,464	-2,544
Zone J	347	531	184	0	355	8
Zone K	419	681	262	0	475	56
Zone L	96	546	450	0	96	0
Zone M	54	48	-6	6	54	0
Totals	**31,116**	**11,678**	**-19,438**	**1,419**	**11,678**	**-19,438**

Projected Number of Parking Spaces Needed: 19,400

Peak Period: *7:00 PM*
Scenario: *Existing*
Event: *Football and basketball games occurring concurrently*

Modify Inputs
Output to GIS

Notes:

Kimley»Horn

Zoning and Parking Requirements

Zoning is the means by which cities and other local governmental agencies ensure that development projects meet the community's standards. It has been termed "a preventative" approach for achieving planned and orderly development."

Summary Table of Uses and Space Requirements

Use	Parking Spaces Required
Single Family Dwelling Unit	2/ Dwelling Unit
Multi-Family Dwelling Unit	
Rental	1.65/ Dwelling Unit
Owned	1.85/ Dwelling Unit
Accessory Dwelling Unit	1/ Dwelling Unit
Sleeping Rooms	1/ Unit or Room plus 2 for owners/managers
Commercial Lodgings	1.25/ Sleeping Room or unit plus 10/1,000 sq ft GLA restaurant lounge plus 30/per 1000 sq ft GLA meeting rooms/banquet plus or, where more than 50 sq ft of meeting banquet per guest room, 20/1,000 sq ft GLA
Elderly Housing	0.5/ Dwelling Unit
Group, Convalescent and Nursing Home	0.33/ Resident
Day Care Center	1 space per employee plus 1.2 spaces per person licensed capacity enrollment, plus drop-off spaces equal to one for each eight enrollees permitted
Hospital/Medical Center	0.4/ Employee plus 1 space/ 3 beds plus 1 space/ 5 average daily outpatient treatments plus 1 space for each 4 members of medical staff. (Medical centers and teaching hospitals add 1 space for each student, full-time faculty/staff)
Retail Service	
General Retail	3.3/1,000 sq ft of GFA
Convenience Retail	4.3/1,000 sq ft of GFA
Service Retail	4/1,000 sq ft of GFA
Hard Goods Retail	2.5/1,000 sq ft GFA interior sales space plus 1.5/1,000 sq ft of interior storage and exterior display/ storage areas
Shopping Center	4/ 1,000 sq ft GLA for centers with up to 400,000 sq ft GLA; scaled for centers with 400,000 to 600,000 sq ft; 4.5/1,000 sq ft of GLA if over 600,000
Personal Care Services	2/ Treatment station but not less than 4/1,000 sq ft of GFA
Coin Operated Laundries	1 space/ 2 washer and dryer machines
Other Retail/Service Uses	As determined by the Zoning Administrator
Temporary Retail	3.3/1,000 sq ft of GFA
Motor Vehicle Sales and Services	2.5/1,000 sq ft of GFA interior sales space plus 1.5/1,000 sq ft of external display (does not include stock areas closed to the public) plus 3/ service bay
Motor Vehicle Laundries	1 space per each 2 peak shift employees plus queue space for vehicle count equal to one and one-half times the maximum hourly capacity of the facility
Food and Beverage	
Fine Dining and Eating and Drinking	20/1,000 sq ft GLA
Family Restaurant	15/1,000 sq ft GLA
Fast Food	15/1,000 sq ft GLA
Office and Business Services	
General Business Offices	3.8/1,000 sq ft of GFA for GFA up to 25,000 sq ft; scaled for GFA 25,000 to 100,000 sq ft; 3.4 for GFA of 100,000 sq ft; scaled for GFA between 100,000 and 500,000 sq ft; 2.8/1,000 sq ft GFA for GFA over 500,000 sq ft
Consumer Service Offices	4.5/1,000 sq ft of GFA for GFA up to 25,000 sq ft; 4.0/1,000 sq ft GLA for GFA over 25,000 sq ft
Data Processing/ Telemarketing/Operations Offices	7/1,000 sq ft of GFA for GFA up to 25,000 sq ft; 6/1,000 sq ft GFA for GFA over 25,000 sq ft
Medical Offices (not part of hospital campus)	4.5/1,000 sq ft GLA
Medical Offices (on hospital	4/1,000 sq ft GLA

ex.

- With respect to parking, zoning standards typically lay out formulas for determining how many parking spaces must be provided for specific types of land uses.
- Design standards are often included. The layout of parking, particularly the size of parking spaces and aisles, is frequently covered.
- There will always be variations in demand within a community, so that a single rigid formula may not adequately cover all situations for each land use category.
- Reviewing zoning requirements on a regular basis is recommended.
- New concepts such as "Form-Based Codes" are rapidly gaining in acceptance.

Form Based Codes

A form-based code is one that is based primarily on “form” - urban form, including the relationship of buildings to each other, to streets and to open space. This contrasted to codes that are based primarily on land use.

- A Form-Based Code is a development code that provides the developer / applicant greater flexibility in permitted land uses in exchange for more stringent regulations controlling urban form.
- These types of codes support mixed-use, pedestrian-friendly and mixed housing development more effectively than conventional codes.
- Form-Based Codes are becoming increasingly attractive to municipalities that want greater control over how buildings look and feel.

ex.

A BRIEF COMPARISON OF CONVENTIONAL CODES AND FORM-BASED CODES	
URBAN FORM GENERATING CHARACTERISTICS	
CONVENTIONAL CODES	FORM-BASED CODES
• Include extensive lists of permitted, prohibited and conditional uses by zone. Many land uses in conventional codes lists are outdated and do not reflect the nature of contemporary employment models or dwelling types • Often disallow a mix of uses • Prohibit adaptability of buildings to other uses over time • On zoning maps, land use designations typically begin and end at the center of the street or Right of Way	• Consider the building “walls” that frame the Right of Way (often referred to as the “public realm”) as one of the primary determinants of form • Regulating plan zone designations typically transition at the back of the lot • The same or similar development standards typically apply to both sides of the street • Land uses allow a much broader range of uses within a zone or subarea; also allow a greater mix of uses • Many uses are allowed if they meet performance standards

Parking Requirements for Transit Oriented Developments

The rise in popularity and success of "Transit Oriented Developments" or TODs is creating a need to reassess and redefine zoning and parking requirements for these districts.

» Specific development plans for TODs and "Transit Station Areas" has led to the development of specific station area typologies to support transit friendly development.

Planning for Transit-Friendly Development at the 43rd Street El Station

ex.

Client:
Jones Lang LaSalle and Chicago Transit Authority

Location:
Chicago, IL

Services:
Transportation and urban planning, and public involvement

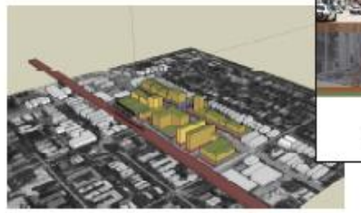
Chicago Transit Authority Station Area Typology Study

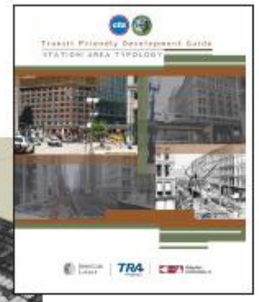
Kimley-Horn led the urban planning element of the initiative by the Chicago Transit Authority (CTA) to create a typology or hierarchy for station areas around each of the 144 CTA stations. The objective is to establish a set of guidelines by which planning and design of transit friendly design (TFD) projects can occur in these station areas and to identify incentives to future development projects through zoning, funding, and public private partnerships.

Kimley-Horn gathered data related to station area characteristics and led workshop meetings of the advisory committee to reach a consensus as to the definition and application of each of seven typologies.

Seven Typologies
- (DC) Downtown core
- (MC) Major activity center
- (LC) Local activity center
- (DN) Dense urban neighborhood
- (UN) Urban neighborhood
- (SD) Service Employment District
- (MD) Manufacturing Employment District

Various one-on-one meetings with elected officials and more formal stakeholders' meetings and open house formats also were conducted. Conceptual design guidelines and recommendations have been developed and a final report was prepared in "magazine" workbook format. The final document entitled *Transit Friendly Development Guide, Station Typology* will be used by the city, CTA, elected officials, and developers to encourage appropriate development around stations.





TransitCTA Typology.indd

Kimley-Horn and Associates, Inc.

Program Criteria Documents

Program Criteria Documents are a tool to help ensure that institutional goals, objectives and standards are incorporated during the early phases of project planning and development.

ex.

» Program Criteria Document benefits:

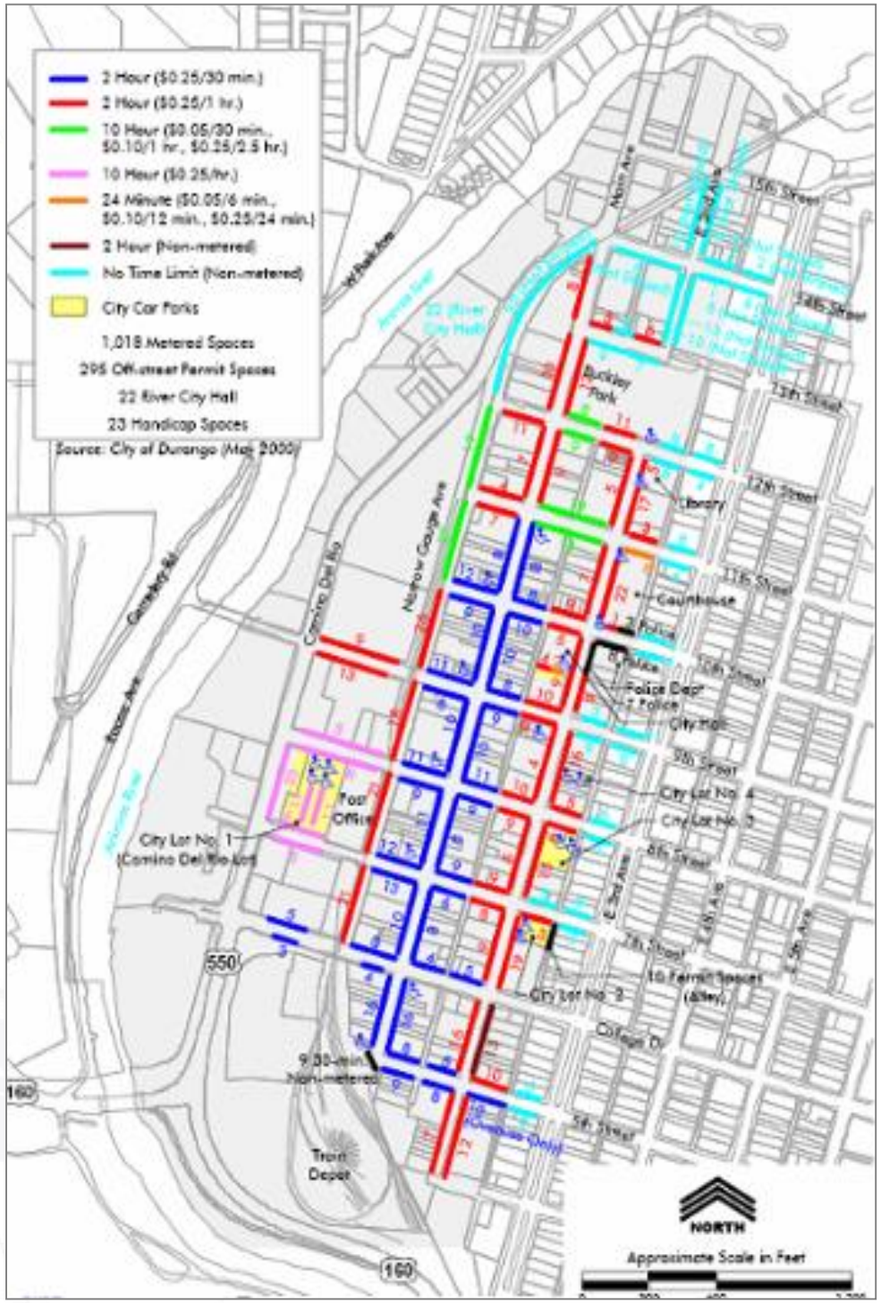
- Development of a more comprehensive understanding of the project impacts and scope.
- Build or strengthen project momentum and acceptance.
- Promote parking-specific areas of concern that are often overlooked without direct and early involvement by parking professionals, such as:
  - designing for operational flexibility
  - planning for alternative payment technologies
  - designing to maximize passive security, user comfort, etc.

Time-Limit Maps

On-street parking time-limits should be mapped and changes tracked over time.

- Mapping on-street time-limits is an important tool for staff education, and communicating with the public.
- It is a fundamental tool for documenting resource usage, facilitates the analysis of trends and is an effective planning tool.
- Tracking changes over time creates a record of management strategies that have been used in the past.

ex.

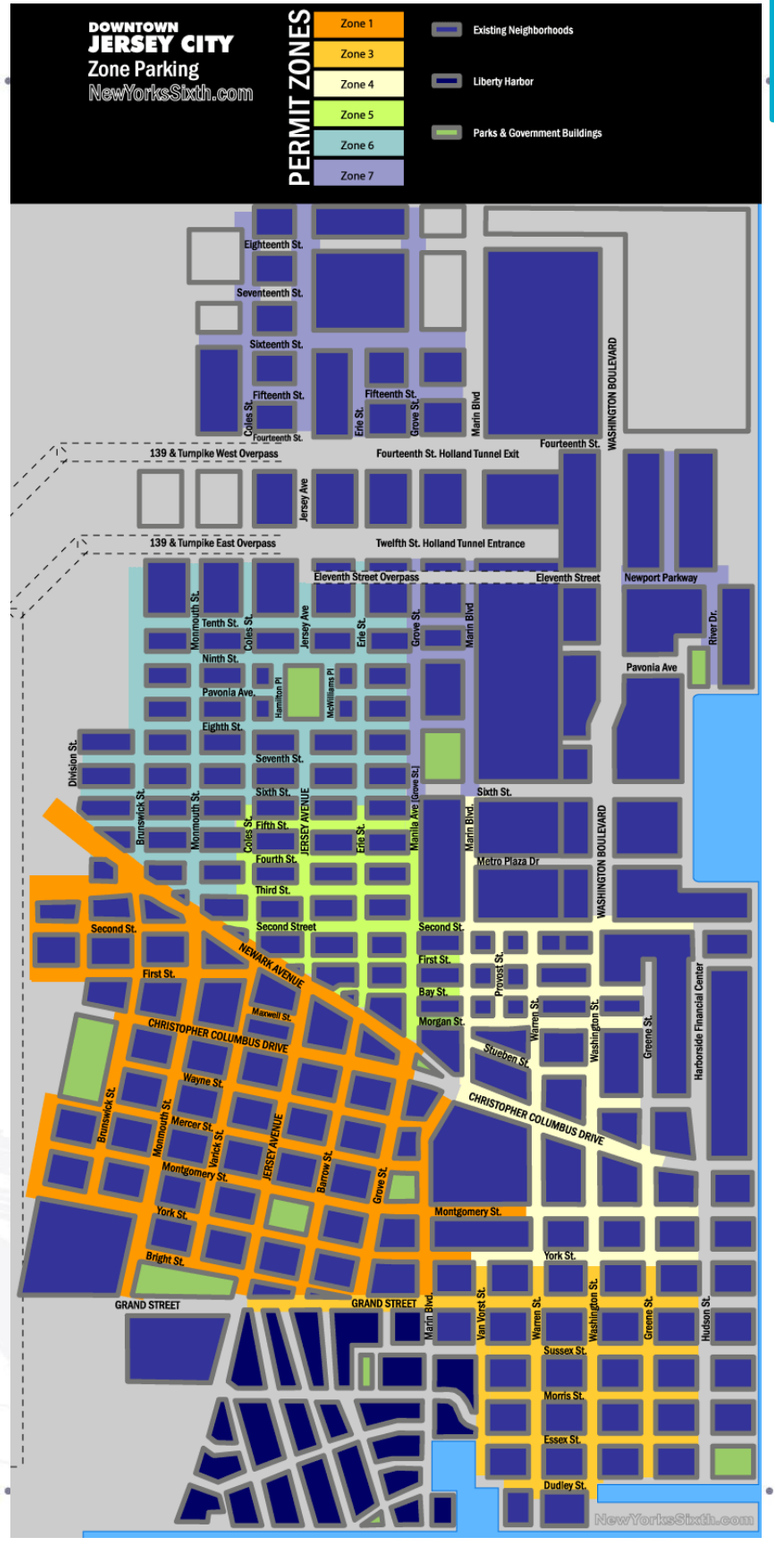


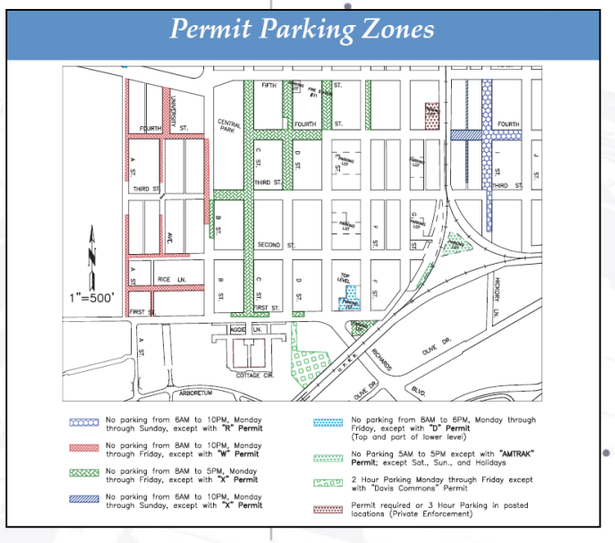
Mapping Parking Permit Zones

Mapping parking permit zones provides an important tool to effectively communicate the permit zone rules and regulations as well as locations.

- This practical tool helps you better educate City Council members other planning officials and citizens at large.
- It also provides a means of documenting changes to permit zones over time.
- It is also an important tool for training new parking enforcement officers.

ex.





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Parking Rate Assessment Strategies

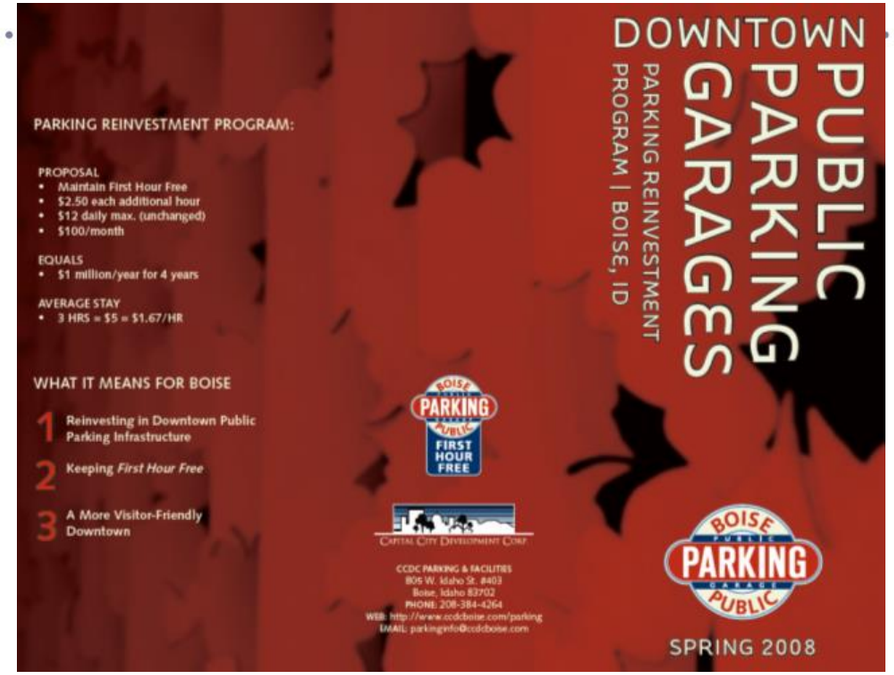
Assessing parking rates is something every parking program must do from time to time. A successful parking rate assessment strategy has two key elements:

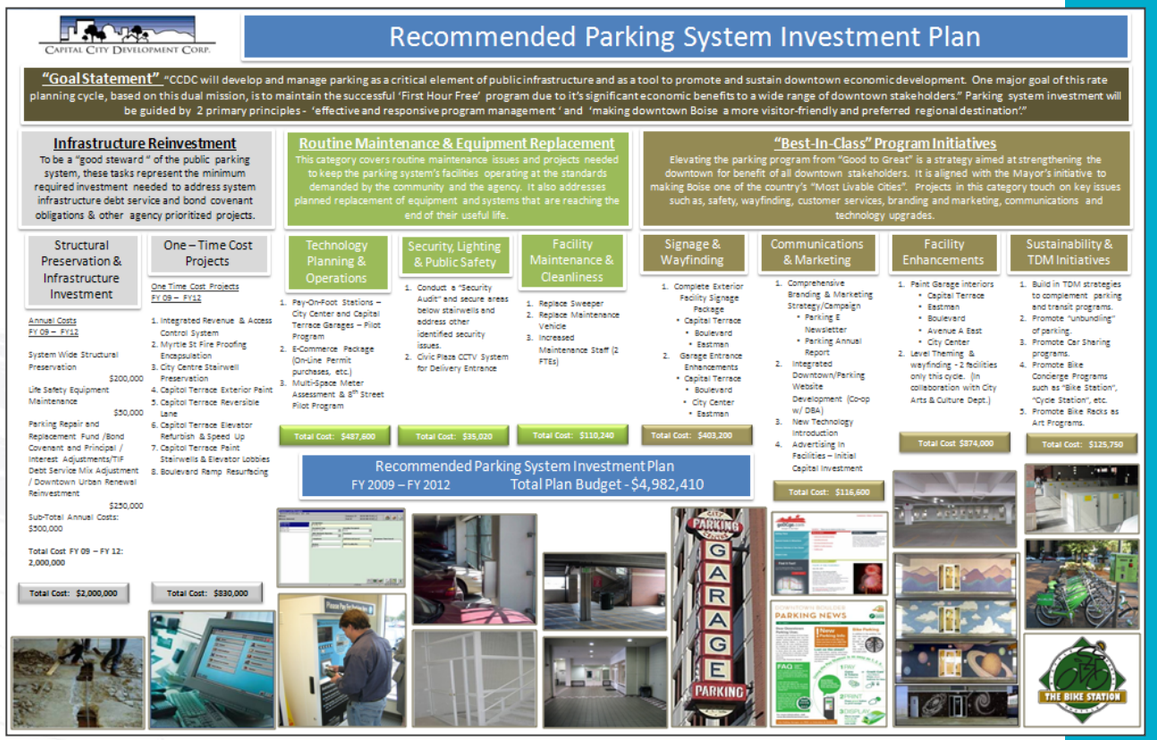
- Defining the type and impact of rate increase options &
- Defining a program for how new revenues will be invested.

» Our recommended process includes the development of a parking rate modeling tool that can be used to project parking revenues by any incremental increase in transient, monthly and special event rates.

» The process also includes the development of "parking investment plan" which is essentially the program's work plan for the defined planning horizon.

ex.





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Retail Supportive Parking Strategies

Revitalizing retail in a downtown setting is one of the most difficult elements of downtown revitalization to get right. Convenient, plentiful and easily accessible parking is especially critical to the success of retail in a downtown area.

» What is often overlooked or underestimated in retail revitalization projects is a comprehensive "retail parking strategy".

» In many cases this will involve significant investment in new parking infrastructure or at least a restructuring or reallocation of existing parking resources.

» Once the parking supply issues have been addressed, a wide range of parking management strategies should also be considered.

ex.

We recommend a three pronged approach to developing a retail parking strategy:

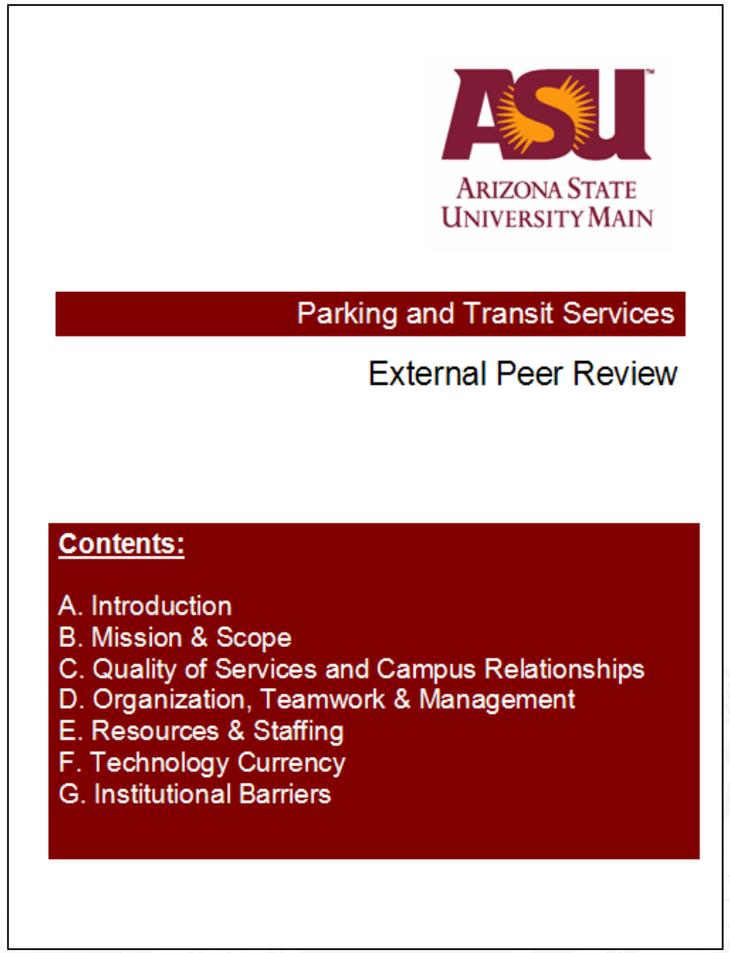
» **On-street Parking** – As the most conveniently located parking assets (and therefore the most valuable), effective management of on-street parking to promote turnover is critical.

» **Off-street Parking** – In a downtown environment the primary issues related to retail parking are to provide large, easy-to-find reservoirs of parking within close proximity to the retail cores or corridors.

» **Overall Parking Management** - From a management and operations perspective, there are many effective strategies that downtown parking programs can employ to better support retail and the larger community's strategic goals.

Operational Peer Reviews

This is a low cost initiative that can be set up through local, regional or national parking associations.


ASU
ARIZONA STATE UNIVERSITY MAIN

Parking and Transit Services

External Peer Review

Contents:

A. Introduction
B. Mission & Scope
C. Quality of Services and Campus Relationships
D. Organization, Teamwork & Management
E. Resources & Staffing
F. Technology Currency
G. Institutional Barriers

ex.

- The scope of peer reviews vary, but are generally focused on operational elements and might include maintenance practices, staffing and staff training, the use of technology, customer services practices, etc.
- Peer reviews are often reciprocated.
- The ASU External Peer Review brought in four other university parking system administrators from across the country and generated a very professional and objective system assessment.

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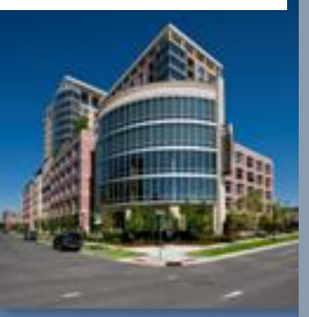


Ch.
4

Integrated Access Management Strategies

What is “Integrated Access Management”?

“Integrated Access Management” is a term that refers to a more holistic approach to community or institutional planning relative to parking and transportation.

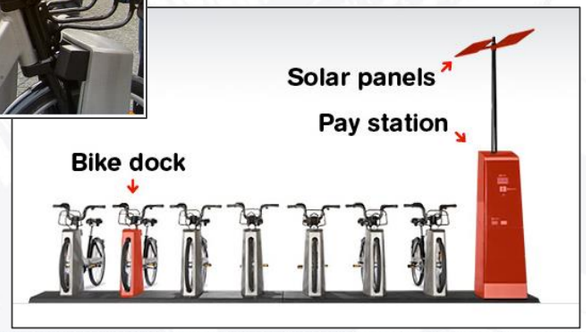
- Within the parking arena, this concept strives to promote a broader view of program scope and participation.
- It fights the tendency to place parking in a “silo”, divorced from the larger transportation equation.
- The primary intent of this approach is to get communities to focus on “access” incorporating the full range of parking, transportation and demand management strategies to improve not only access, but to also enhance and promote walkable urban environments.

ex.

Community Bike Rental Programs

Located at key locations in the central business district, the bikes provide a new way of discovering and moving around the city.

- The bike stations are modular and the bikes are ergonomic and light-weight in a distinct design.
- Bikes are parked at docking points which use a proprietary locking system to ensure that each bike is securely stored.



ex.

- http://www.smartbikedc.com/

Operations

Bike Stations

Docking Points

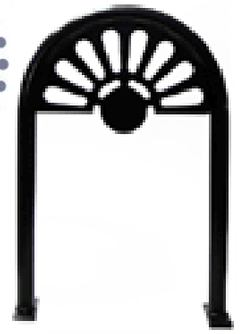
The Bikes

Bike Parking & Lockers

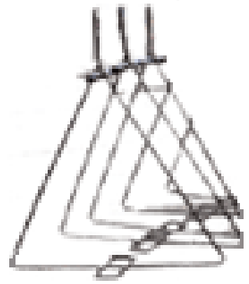
One more way for parking programs to support Transportation Demand Management (TDM) is through the provision of bike lockers in and around parking facilities. This is also a means of securing LEED credits in support of parking program sustainability goals.

- Bicycles chained haphazardly to railings, posts or lamp columns can be dangerous and inconvenient to pedestrians, particularly visually impaired people.
- Proper bicycle parking can reduce this risk, as well as removing unsightly clutter.

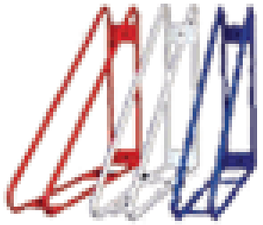
ex.



Vintage Bike Racks



Portable Bike Racks



Wall Mounted Racks

Bike Racks on Busses – Practice Makes Perfect

For those advanced parking systems that are part of the larger transportation solution, providing access to transportation options through the parking office is not uncommon.

» However, the University of Washington provides a “practice station” for those wishing to learn how to put their bike in the “on-bus bike racks”.

ex.

» This little extra effort is one of the many things that sets the UW program apart.

Be an Engaged Partner in Other Community Transportation Initiatives

As part of the commitment to a broader approach to community access strategies, the parking program should become an interested and engaged partner in other community transportation initiatives.

» Getting involved in the Dallas Bike Plan is a good example of this type of recommended strategy.

ex.

2011 DALLAS BIKE PLAN Newsletter November/December 2010

Newsletter November/December 2010

2011 DALLAS BIKE PLAN

INTEREST IN BIKE PLAN STILL STRONG AT SECOND PUBLIC MEETING

On Thursday, September 23, over 200 people participated in the second 2011 Dallas Bike Plan Public Meeting at City Hall. Council members Angela Hunt (District 14) and Sheffield Kadane (District 9) provided the welcome and words of support for the Plan. Peter Lagerwey provided an overview of the draft Bikeway System network recommendations, including over 550 miles of on-street facilities. After the presentation, participants were invited to review and comment on these recommendations laid out on maps showing the proposed network segments as well as the facility type for each. Other public feedback gained through separate stations dealt with project prioritization criteria and marketing and promotion ideas for the Plan's *Implementation Strategy*. Information on the Plan's vision, goals and objectives as well as educational materials were also available.

Review and comment on the draft bikeway recommendations at public feedback stations included a map of Dallas divided into four quadrants, a map of downtown Dallas, and maps of the Trinity Corridor. Other stations provided information on plan goals and objectives, education for bicyclists and motorists, project prioritization criteria and marketing and promotion.

"A paper product is not an end in itself. The only reason we're doing this project is so it can be implemented." - Pete Lagerwey

deemed to be practical and possible
- Difficult intersections within the anticipated bicycle network were analyzed
- Connectivity gaps were addressed, and
- Projects to be identified in the Plan's *Implementation Strategy*.

SURVEY PROVIDES OPPORTUNITY FOR CITY-WIDE INPUT

A web-based, bilingual survey was made available on the project website (dallasbikeplan.org) from May 18 to July 11, which elicited over 1,400 responses. The survey results will help the project team describe existing conditions, opportunities and constraints, and develop project and policy recommendations in the Plan. The most frequently cited needs were for:
- Education for all travelers through on-road signage and other techniques to instruct users how to share the road
- More bike lanes on major streets and shared lane markings on wide outside or curb lanes
- Stronger bike connections to transit
- Additional parking
- More off-street facilities and on-street connections between them

Nearly all respondents were ages 21 to 65; 42% of these between 46 to 65 years old. 30% of respondents were women.

Existing Bike Behavior: Percentage of Bike Trips by Purpose (based on survey)

FIELD WORK

Three two-person teams conducted a feasibility analysis of over 550 miles of Dallas streets over a two-week period during the Summer of 2010. Taking into account observed and recorded traffic volumes and existing roadway (curb-to-curb) widths, the field work teams identified 517 miles of roadway that could include context-appropriate bicycle facilities. Facility recommendations were identified for all areas and a variety of roadways within the City in order to serve transportation and recreational needs. As a result, the recommended network establishes inter-connected routes on a variety of street types, including arterials, collectors and local streets.

According to this analysis, there are many scenarios where the opportunity exists to install bicycle lanes or cycle tracks by re-allocating roadway space via a technique called a "road diet" (see graphic example right).

DRAFT BIKEWAY SYSTEM FACILITY RECOMMENDATIONS

Bikeway Type	Miles	Percentage
Bike lanes	157	27%
Shared lane markings	185	31%
Climbing lanes (bike lane on uphill side only)	3	0.5%
Paved shoulder	24	4%
Cycle track/buffered bike lane	90	15%
Multi-purpose path/wide sidewalks	58	10%
Further study needed	66	11%
TOTAL MILES	583	

STAY INFORMED ON THE BIKE PLAN WEBSITE

The 2011 Dallas Bike Plan website (www.dallasbikeplan.org) serves as a one-stop source providing input on the Plan, getting info on Bike Plan and Dallas area bicycling activities, as well as downloading or viewing draft Bike Plan products. The website also provides news and information on the project schedule, and educational materials. Other links include information on the Safe Routes to School Program and the Complete Streets Initiative.

NEXT PUBLIC MEETING - THURSDAY, JANUARY 20, 2011
Dallas City Hall Flag Room (6E North)

Review the revised network recommendation maps based on comments from the September Public Meeting and a full draft of the 2011 Dallas Bike Plan. Visit our web site at www.dallasbikeplan.org for more details on the agenda as the time gets near.

2011 DALLAS BIKE PLAN

2011 Dallas Bike Plan
4140 Commerce Street
Suite 101
Dallas, Texas 75226

Kimley»Horn

Bike Parking As Public Art!

Bike racks have become a favorite medium for creating practical and engaging community public art.

ex.

Integrate Intermodal Options

Installing bike lockers is just one example of incorporating multi-modal options into parking structures and contributing to a more balanced parking and transportation program.

ex.

- Other more aggressive strategies include integrating bus or shuttle transfer stations into parking garages.
- Creation of express park and ride lots, etc.

Kimley»Horn

Transit Visualization System

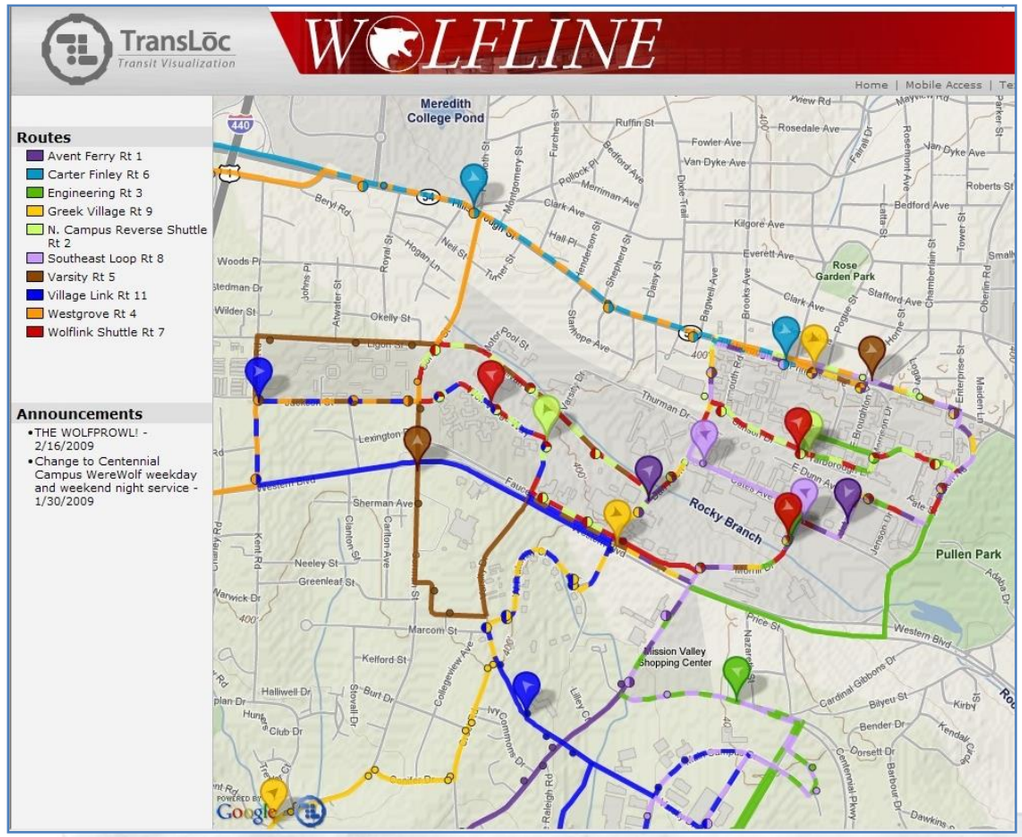
TransLōc
Transit Visualization Systems

See What We've Done

- Auburn University *Tiger Transit*
- Emory University *Emory Shuttles*
- Harvard University *Harvard Shuttle*
- MASCO - Boston, MA *LMA Shuttle*
- Microsoft Silicon Valley *Shuttle Connect*
- NC State University *The Wolfline*
- Princeton University *TigerTransit* (new)
- University of Alabama *CrimsonRide*
- University of Florida *Regional Transit System*
- University of Maryland, BC *UMBC Transit*
- Yale University *Yale Transit*

The TransLoc Transit Visualization System shows buses moving in real-time live on the internet, making it easier for riders to use transit.

ex.



- North Carolina State University in Raleigh, NC was the first transit system in NC to broadcast its bus locations live over the internet.
- Since then, many other transit systems have added the TransLoc Transit Visualization System.
- You can view the live, interactive system at: http://live.transloc.com

PARKING | The Next Level

PARKING MANAGEMENT & DESIGN - **Best Practices**

Kimley»Horn

Ch. 5

Effective Communications & Community Engagement

Strategic Communications

A Strategic Communications Plan has the power to transform an organization:

- Both in terms of your credibility and status in your community
- And in terms of the way you work together as a team to achieve your mission and vision

The Communications Plan Pyramid

- ✧ Assess your communications infrastructure
- ✧ Establish your goals
- ✧ Who is your target?
- ✧ Who is your audience?
- ✧ How to frame your issues?
- ✧ What is your message?

ex.

Parking Information Clearinghouse

An important role your organization can play is to become THE parking information clearinghouse for your community.

- If you become the “go to source” for all parking info, you will not be providing a needed service, but you will enhance your program’s value and reputation in the community.
- (You may actually learn as much as you inform!)
- Developing a web-based program is one effective way of serving multiple goals in this type of endeavor.

ex.

Keep In Touch... Parking E-Newsletters

Even if you don't have your own parking "E-Newsletter (and why not?), see if you can tag a message onto other appropriate E-venues.

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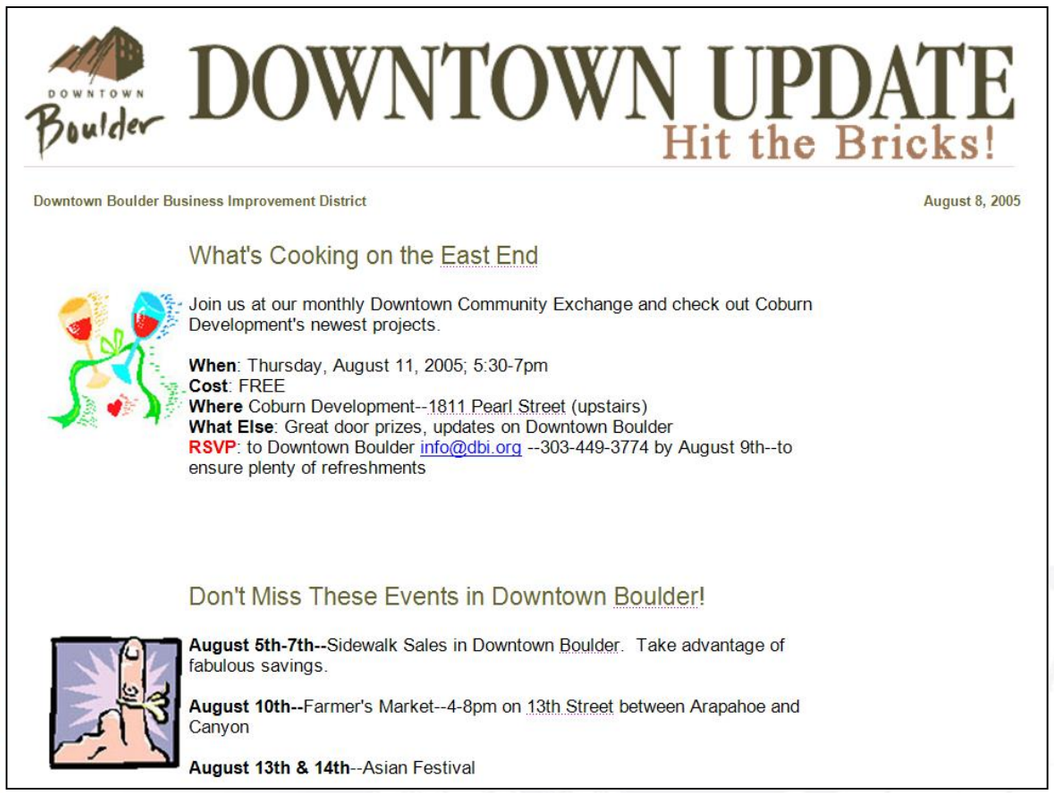


DOWNTOWN Boulder

DOWNTOWN UPDATE

Hit the Bricks!

Downtown Boulder Business Improvement District — August 8, 2005

What's Cooking on the East End

Join us at our monthly Downtown Community Exchange and check out Coburn Development's newest projects.

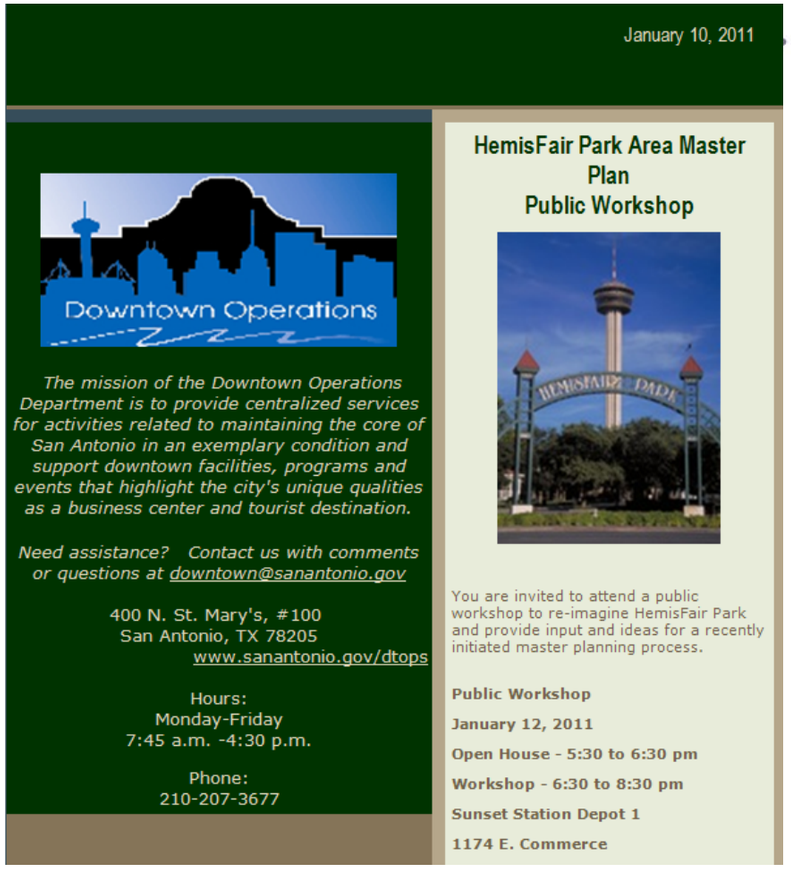
When: Thursday, August 11, 2005; 5:30-7pm
Cost: FREE
Where Coburn Development--1811 Pearl Street (upstairs)
What Else: Great door prizes, updates on Downtown Boulder
RSVP: to Downtown Boulder info@dbi.org --303-449-3774 by August 9th--to ensure plenty of refreshments

Don't Miss These Events in Downtown Boulder!

August 5th-7th--Sidewalk Sales in Downtown Boulder. Take advantage of fabulous savings.

August 10th--Farmer's Market--4-8pm on 13th Street between Arapahoe and Canyon

August 13th & 14th--Asian Festival



January 10, 2011

Downtown Operations

The mission of the Downtown Operations Department is to provide centralized services for activities related to maintaining the core of San Antonio in an exemplary condition and support downtown facilities, programs and events that highlight the city's unique qualities as a business center and tourist destination.

Need assistance? Contact us with comments or questions at downtown@sanantonio.gov

400 N. St. Mary's, #100
San Antonio, TX 78205
www.sanantonio.gov/dtops

Hours:
Monday-Friday
7:45 a.m. -4:30 p.m.

Phone:
210-207-3677

HemisFair Park Area Master Plan
Public Workshop

You are invited to attend a public workshop to re-imagine HemisFair Park and provide input and ideas for a recently initiated master planning process.

Public Workshop
January 12, 2011
Open House - 5:30 to 6:30 pm
Workshop - 6:30 to 8:30 pm
Sunset Station Depot 1
1174 E. Commerce

- » Promote parking validations.
- » Links to parking info/websites.
- » Promote merchants that participate in validation programs.
- » Promote parking availability.
- » Promote alternative transportation options.

Parking Meets Social Media

Get the word out! Stay in Touch!

- Develop your own communities of users
- Advertise directly
- Celebrate accomplishments
- Highlight staff
- Offer Facebook only coupons
- Get program feedback
- Solicit testimonials
- Provide event notifications
- Broadcast construction updates

Follow us on: twitter

Find us on Facebook

ex.

Parking Meets Mobile Apps

Connecting with a world on the move!

- Availability
- Rates
- Services
- Proximity to key destinations

ex.

Mobile Parking Apps

Mobile Parking Apps will help you find the cheapest parking rates anywhere in Chicago, San Francisco, San Diego, Seattle, LA, and New York. More cities are coming soon... Avoid overpaying for parking by comparing rates from neighborhood garages. Ability to search by an address.

Features:

* Search over 300+ Parking Garages to find the best rates (by hour, daily, weekend, monthly)

* Map showing all Meters, Zones, Rates, and Paybox locations

* List showing all the Early Bird Specials in the city

* Search for local parking spots for rent and sale

*Save yourself a parking ticket with the built in parking timer.

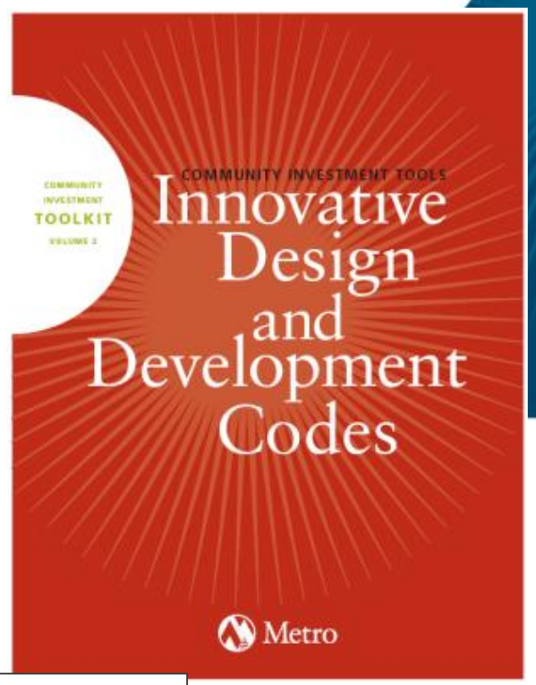
*Remember where you parked with turn by turn directions back to your car. Ability to leave voice memo

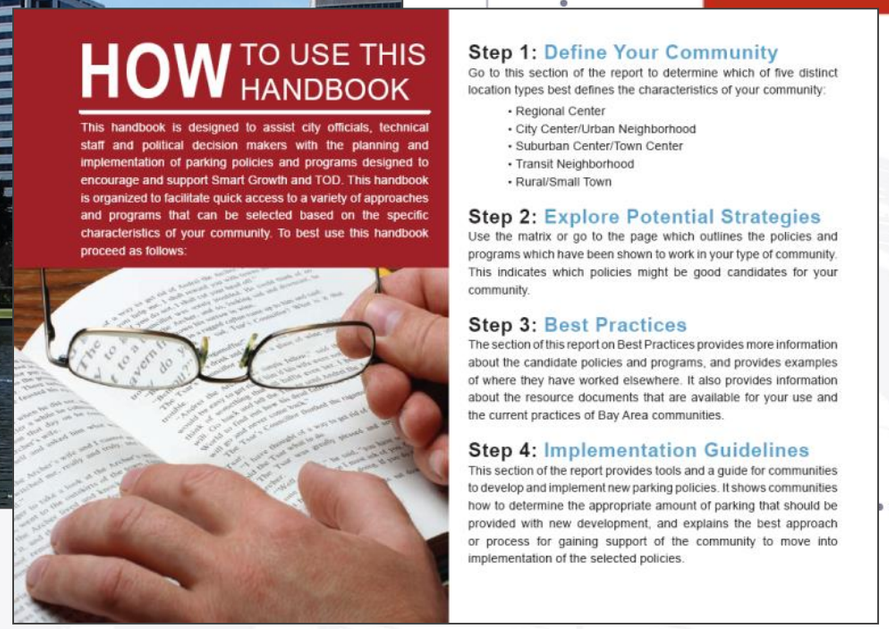
* Real-Time updates, Reservations, public transportation schedule

Developing Smart Parking & Development Educational Tools

Being a leader in the development of planning and development toolkits can improve the image and reputation of your organization (as well as advancing your planning goals)!

ex.





Kimley»Horn

Enter the Blogosphere!

- Do you really want to know what people think? (Are you sure???)
- Have a couple hundred opinions you'd like to share?
- Want to get YOUR version of things expressed?

Then Blogging may be just your thing!

» To start your own blog visit:

http://parkingpress.com/

» Other parking blogs:

Parking Blogs

Grush Hour

MoBlog

Parking By Design

ParkingCarma

ParkWhiz Blog

PT's Parking Blog

Airport Parking Connection

About

Subscribe

Subscribe to ParkingPlanet
Want to get an e-mail each time I post a new entry here? I'll notify you with my spam-free e-mail list. To sign up just send me an e-mail with the word *parkingplanet* in the subject and I'll add you to the list.

Older Essays

Name Dropping

The Cargo Container of the Parking Business

Personalized Parking

CPA Award!

Innovation in Parking

ex.

Parking Blogs
Just another weblog

Parking Planet
The world's first technology and parking blog.

Parking Blogs

Grush Hour
MoBlog
Parking By Design
ParkingCarma
ParkWhiz Blog
PT's Parking Blog
Airport Parking Connection

Online Parking Games (Flash)

Park My Big Rig
Park the Pope
Parallel Park
Parking: Battle of the Sexes
Parking Perfection
Yellow Out

ParkingPlanet Visitors

July 03, 2009

Stop the Internet... I want to get off!

Didja notice that I haven't posted anything in a while? Yeah, I noticed too.

That doesn't mean I haven't been busy. I've been writing a regular technology column for the National Parking Association's magazine (called Parking in case you didn't know). So that's kept me blogging in printed format... sorry, no online link available for these articles.

And speaking of meat space, I've written a few articles for the IPI's magazine as well, including one called "Parking In the Cloud" which was spawned from a letter to the editor, related to another article I wrote earlier this year. That should be published sometime soon, but I'm not sure when, and I don't know if it will be online either.

So you might ask, "Hey Blake, what exactly ***have*** you done online lately?"

And I'd have to say "Online? Not much. I'm trying to get off the Internet."

"Get off the Internet? Are you crazy? The Internet gives you freedom!"

However in my attempts to get off the Internet I seem to become more entangled all the time.

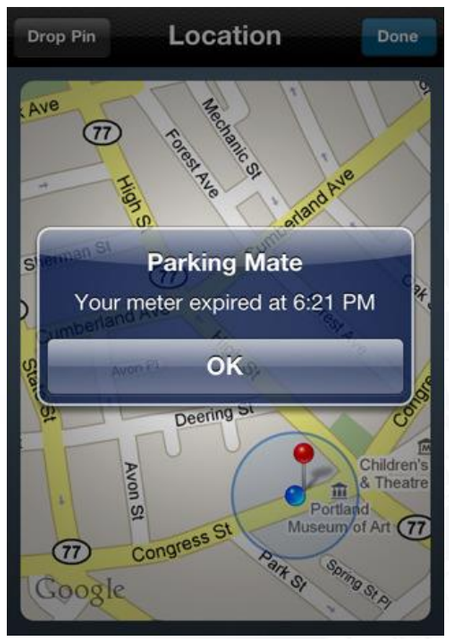
Take, for example, my awesome rap video. Yes, I made a video. It wasn't supposed to go onto the web but somebody posted it there anyway. The idea was that some parking software company was running a little campaign about how you got started in your parking career (because none of us actually chose parking as a career - instead parking picked us). But I digress...

Kimley»Horn

Customer Alerts - Parking E-Notifications

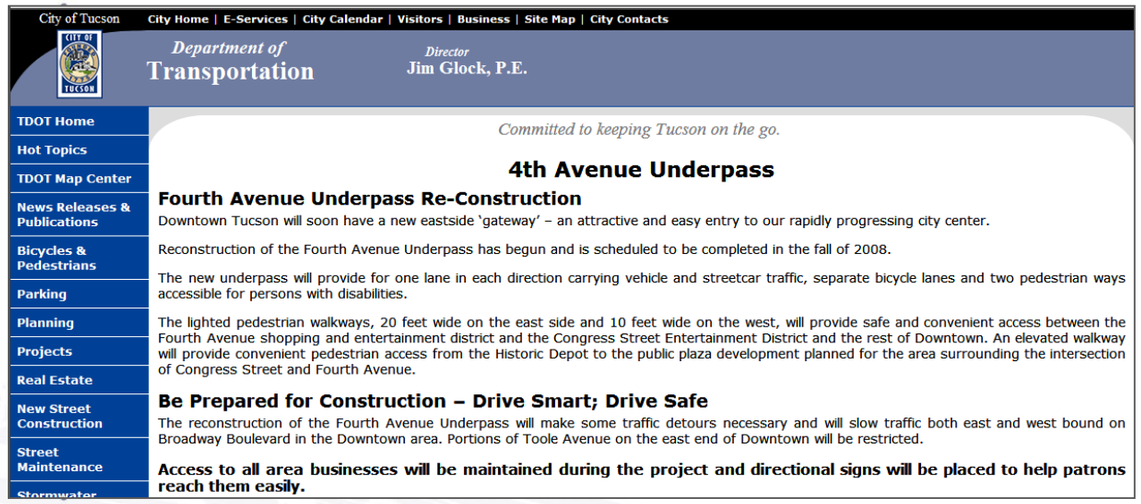
The evolution of technology, especially in the area of mobile devices is transforming our customer service options.

Now we can send out customer notifications in real-time through a variety of channels.



ex.

- Reduces parking patron frustration
- Improves the image of the downtown or institution
- Can be very useful in snow closings, or to alert a campus community of on-going construction activities.



Kimley»Horn

"Fast Facts" – Program Summary

What is your program really all about? How do inform your stakeholders of your mission, key program goals, funding sources, key staff, staff roles, organizational structure, policy positions, budget highlights, accomplishments, etc.

The "Fast Facts" mini brochure covers all these topics and more in a succinct and meaningful way.

ex.

» Using a creative 3.5" x 17" double-sided layout, this info packed mini-brochure is filled with valuable information and manages to capture the scope, mission and accomplishments of the organization in a positive way.

Specific section headers include:

- Cover – Fiscal 2007 Edition
- Founded/Mission/# Focus Areas/Slogan
- Strategic Goals
- Redevelopment Districts – Central/River Myrtle/Westside/Total
- Urban Renewal Districts
- Whose Job Is It?
- Budget
- Top 10 Cost Issues FY07
- Top 10 Policy Positions
- FY 07 Budget highlights
- Selected Boise Rankings

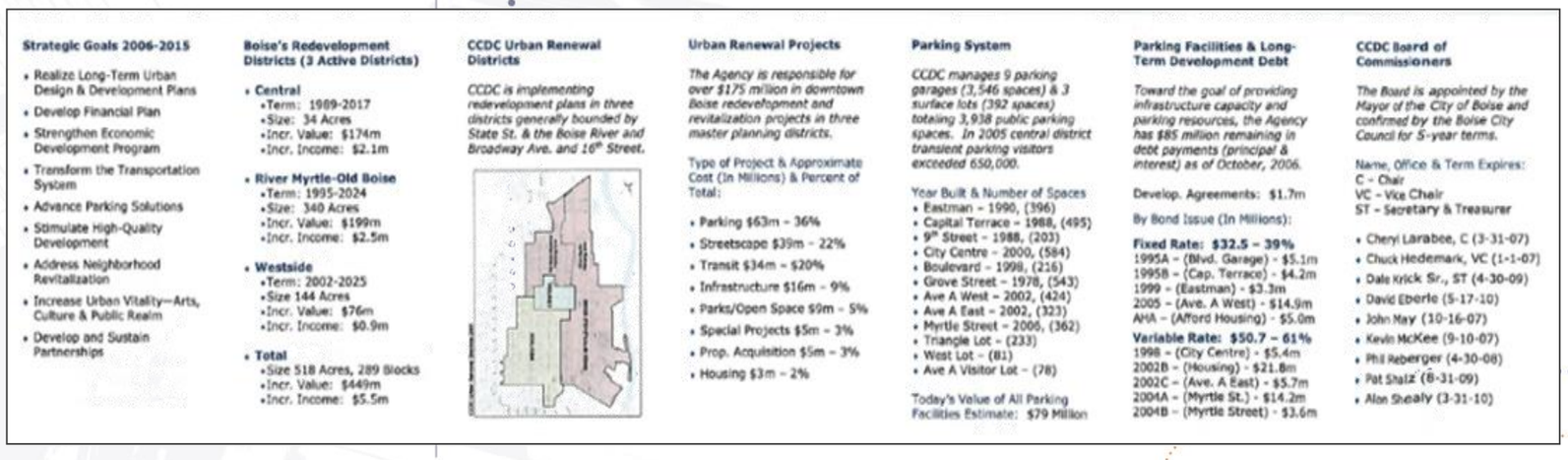
Capital City Development Corp

Capital City Development Corporation '*Fast Facts*'

A fast guide to key information and activities regarding Boise's redevelopment agency.

Fiscal 2007 Edition

- **Founded** by Boise City in 1965 as the Boise Redevelopment Agency (BRA)
- **Mission:** Capital City Development Corporation is a public development agency serving as a catalyst for quality private development through urban design, economic development, and infrastructure investment activities with a goal of creating vitality in Boise's downtown.
- **3 Focus Areas:**
  - Master Planning & Urban Design
  - Economic Development
  - Parking System & Public Spaces
- **Slogan:** *Creating Vitality in Boise's Downtown*



Strategic Goals 2006-2015

- Realize Long-Term Urban Design & Development Plans
- Develop Financial Plan
- Strengthen Economic Development Program
- Transform the Transportation System
- Advance Parking Solutions
- Stimulate High-Quality Development
- Address Neighborhood Revitalization
- Increase Urban Vitality—Arts, Culture & Public Realm
- Develop and Sustain Partnerships

Boise's Redevelopment Districts (3 Active Districts)

- **Central**
  - Term: 1989-2017
  - Size: 34 Acres
  - Incr. Value: $174m
  - Incr. Income: $2.1m
- **River Myrtle-Old Boise**
  - Term: 1995-2024
  - Size: 340 Acres
  - Incr. Value: $199m
  - Incr. Income: $2.5m
- **Westside**
  - Term: 2002-2025
  - Size 144 Acres
  - Incr. Value: $76m
  - Incr. Income: $0.9m
- **Total**
  - Size 518 Acres, 289 Blocks
  - Incr. Value: $449m
  - Incr. Income: $5.5m

CCDC Urban Renewal Districts

CCDC is implementing redevelopment plans in three districts generally bounded by State St. & the Boise River and Broadway Ave. and 16th Street.

Urban Renewal Projects

The Agency is responsible for over $175 million in downtown Boise redevelopment and revitalization projects in three master planning districts.

Type of Project & Approximate Cost (In Millions) & Percent of Total:

- Parking $63m – 36%
- Streetscape $39m – 22%
- Transit $34m – 20%
- Infrastructure $16m – 9%
- Parks/Open Space $9m – 5%
- Special Projects $5m – 3%
- Prop. Acquisition $5m – 3%
- Housing $3m – 2%

Parking System

CCDC manages 9 parking garages (3,546 spaces) & 3 surface lots (392 spaces) totaling 3,938 public parking spaces. In 2005 central district transient parking visitors exceeded 650,000.

Year Built & Number of Spaces

- Eastman – 1990, (396)
- Capital Terrace – 1988, (495)
- 9th Street – 1988, (203)
- City Centre – 2000, (584)
- Boulevard – 1998, (216)
- Grove Street – 1978, (543)
- Ave A West – 2002, (424)
- Ave A East – 2002, (323)
- Myrtle Street – 2006, (362)
- Triangle Lot – (233)
- West Lot – (81)
- Ave A Visitor Lot – (78)

Today's Value of All Parking Facilities Estimate: $79 Million

Parking Facilities & Long-Term Development Debt

Toward the goal of providing infrastructure capacity and parking resources, the Agency has $85 million remaining in debt payments (principal & interest) as of October, 2006.

Develop. Agreements: $1.7m

By Bond Issue (In Millions):

Fixed Rate: $32.5 – 39%

1995A – (Blvd. Garage) - $5.1m
1995B – (Cap. Terrace) - $4.2m
1999 – (Eastman) - $3.3m
2005 – (Ave. A West) - $14.9m
AHA – (Afford Housing) - $5.0m

Variable Rate: $50.7 – 61%

1998 – (City Centre) - $5.4m
2002B – (Housing) - $21.8m
2002C – (Ave. A East) - $5.7m
2004A – (Myrtle St.) - $14.2m
2004B – (Myrtle Street) - $3.6m

CCDC Board of Commissioners

The Board is appointed by the Mayor of the City of Boise and confirmed by the Boise City Council for 5-year terms.

Name, Office & Term Expires:
C – Chair
VC – Vice Chair
ST – Secretary & Treasurer

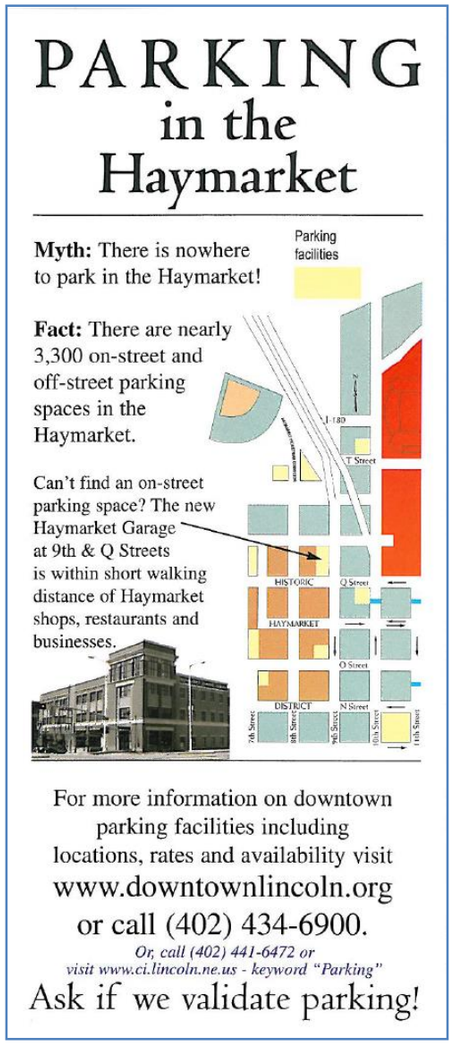
- Cheryl Larabee, C (3-31-07)
- Chuck Hedemark, VC (1-1-07)
- Dale Krick Sr., ST (4-30-09)
- David Eberle (5-17-10)
- John May (10-16-07)
- Kevin McKee (9-10-07)
- Phil Reberger (4-30-08)
- Pat Shalz (8-31-09)
- Alan Shealy (3-31-10)

Know the Numbers – "Combating Misperception"

More often than not, parking problems are more perceived than real. The Boulder & Lincoln parking programs addressed this issue through a "Know the Numbers" campaign.

- 34% more downtown spaces with the opening of 10th & Walnut garage.
- 3,778 City parking spaces in Downtown Boulder.
- 93 merchants that reimburse customer's parking.
- 2,209 Free covered downtown parking spaces on Saturday & Sunday.

ex.



Kimley»Horn

Multi-Language Signage

Increasingly, dual or multi-language signage is becoming more important.

Electronic signage can be useful in providing flexibility.

Pictograms or universal symbologies are becoming the norm.

ex.

Parking News & FAQs
In Related Communications Resources

Tapping into other community communication resources is a great way to educate the community on new parking programs and to promote parking program contributions

DOWNTOWN Boulder **Update**

▸BoulderDowntown.com
▸Forward to a friend
▸Buy a Gift Certificate!
▸Downtown RSS

IN THIS ISSUE: ▼NEWS YOU CAN USE ▼ NEW MEMBERS & OPENINGS ▼ SPOTLIGHT ON ...

NEWS YOU CAN USE

To skip to a specific news item, use the links below! To read them all, just scroll on down.

- Last Day for Spring Green Orders
- Steps for Literacy
- Bolder Boulder Volunteers Needed
- KidLinks Entry Form Now Available
- Hop 2 Chautauqua Kickoff Party
- Bauman College Cooking Demos
- Parking Pay Station Q & A
- Website Tips and Tricks
- **Spotlight On**:Tulip Fairy & Elf Parade

Last Day for Spring Green Orders
It's time again for Downtown Boulder's Spring Green, which means free flowers (Petunias) for businesses in the Downtown Boulder BID. The deadline for putting in your orders is **May 9th,** so **Click Here** to register online, call our office at 303-449-3774 or fax back the Spring Green order form to 303-449-1582. Flowers will be delivered between May 20th and May 23rd.

Picture of the Week

WHAT'S HAPPENING
May 8th - May 25th

This Weekend's Weather

Fri 70/38

ex.

Parking Paystation Q & A

Q: What do I do with my old meter key?

A: Parking Services is working diligently to implement a prepay card to replace the meter keys. The City intends to trade balances on the keys to these new cards.

If you have a specific question you would like answered send an email to parking@dbi.org.

Parking Paystation Q & A
Now that the solar powered pay stations are up and running there are a few questions that people have. This section addresses these questions.

Q: Can I take my time with me?

A: Yes! Once you have your printed receipt displayed on your dashboard, you may move your vehicle to another metered spot until your original time is up.

If you have a specific question you would like answered send an email to parking@dbi.org.

Parking Paystation Q & A
Now that the solar powered pay stations are up and running there are a few questions that people have. This section addresses these questions.

Q: What are the enforced hours?

A: Pay stations are enforced -Monday through Saturday 9am to 7pm. Pay stations are FREE on Sunday and on city holidays. Please go to www.boulderparking.com to verify the holidays the city observes.

If you have a specific question you would like answered send an email to parking@dbi.org.

Stakeholder Forums and Workshops

Park Smart

A Forum to Raise the Bar on Good Parking Policy

Parking has been a hot topic in the news over the last year. Reading the headlines and blogs you'd think there were just two points of view: those who think free parking Downtown is an inalienable right, and those who want to force everyone out of their cars onto transit or bicycles. We think it's time to elevate the discussion about parking in Seattle and assess what we can learn from other cities to better manage the parking we have so that it supports a healthy, vibrant urban core. We've assembled a terrific panel that includes policy makers, national experts, transportation officials and a UW researcher to lead an informed discussion about the best approaches

…ber Tom Rasmussen, chair of Seattle's …ncas.

Featured Panelists:

L. Dennis Burns, CAPP, Kimley-Horn and Associates, Inc.
Dennis Burns is a senior practice builder and regional vice president for Kimley-Horn and Associates, Inc. Burns is a certified administrator of pubilc parking and has nearly 30 years of parking operations, management and consulting experience. His focus in recent years includes parking and transportation strategic planning, 'smart parking' system development and urban space management concepts. In 2010, Mr. Burns was the recipient of International Parking Institute's "Parking Professional of the Year," and was a featured speaker at the first-ever Green Gov Symposium in Washington, DC.

Rick Williams, BPM Development Company
Rick Williams is a transportation demand management expert from Portland, OR with more than 20 years of experience. From 1989-1994, he managed Portland's 3,500-stall Smart Park system and its 208-block downtown business improvement district. In 1995, Mr. Williams helped establish the Lloyd Transportation Management Association, and currently works both as its executive director and as an independent transportation management consultant for clients throughout North America.

Joining the panel will be **Seattle City Councilmember Tim Burgess**, sponsor of variable price parking legislation, and **Daniel J. Evans School of Public Affairs Senior Lecturer Daniel Carlson**, who specializes in community and economic development, and transportation and land use in metropolitan areas. **Seattle Department of Transportation Parking Operations and Traffic Permits Manager Mike Estey** will also discuss the City's new on-street parking policy.

Combine community education and stakeholder input into a community workshop!

This is also a great opportunity for collaborating with other community partners.

Presented By:

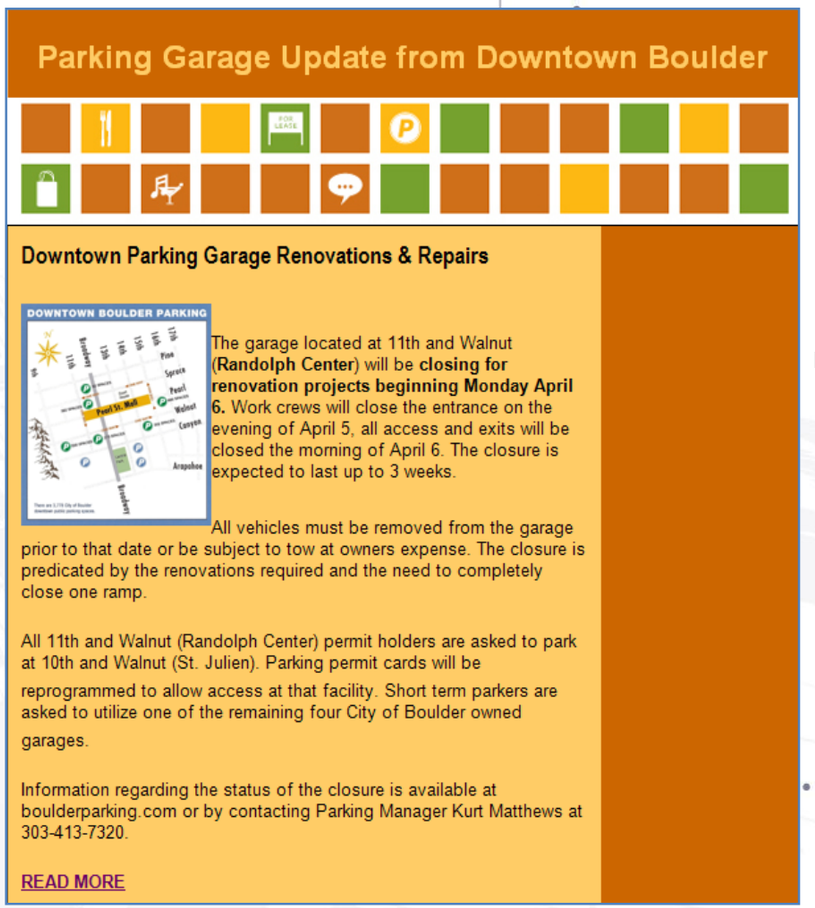
Downtown Seattle Association
BOMA Seattle King County
City of Seattle
Commute Seattle
Great City
Seattle Hotel Association
Transportation Choices Coalition

Kimley»Horn

Keeping Your Customers Informed During Renovations / Repairs

Keeping customers informed, especially during significant garage repair and renovation projects, is important.

Developing a flexible format for information sharing on a regular basis is a preferred approach.



ex.

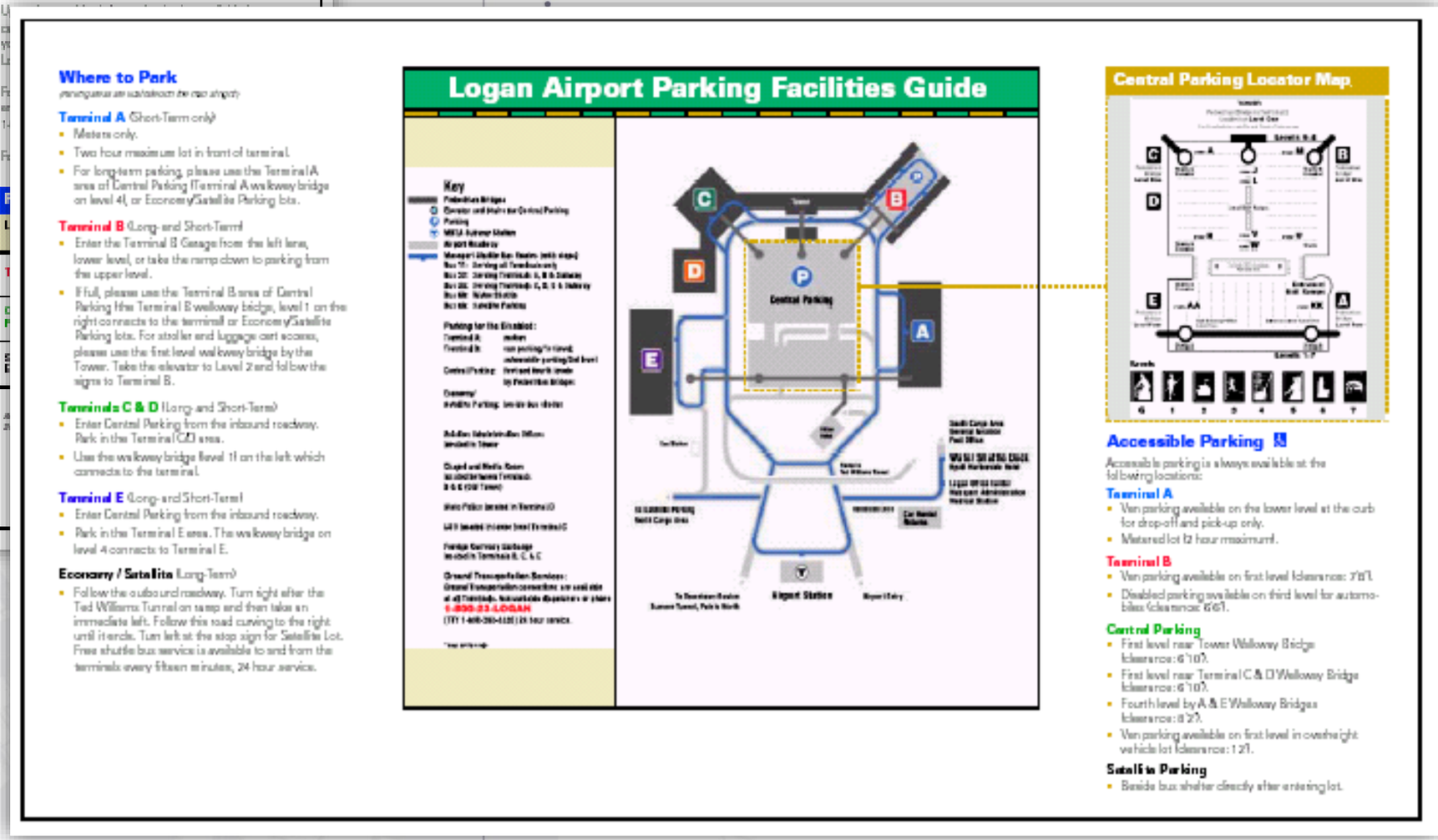
» Key Elements for a Garage Repair Update include:

- Names & locations of affected facilities
- Dates & times of impacts
- Duration & nature of impacts
- Alternative locations during construction/repair work
  - Provide different instructions for employees / contract parkers & visitors/short-term parkers if appropriate
- Where to go to get additional information

Where Did We Park?

ex.

Parking orientation tools are very helpful in large parking garages especially if the customer is unfamiliar with the facility.



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Parking Branding & Marketing "Comes of Age"

Branding and Marketing

Developing a parking system “Brand” is one trademark of “Best in Class” parking programs.

Ultimately, a positive patron experience should be your brand.

ex.

- The brand is more than just a logo.
- The brand should promote the image you want people to have of the system.
- It should be something you can say, such as “Easy Park” or “Park Smart”
- It should reinforce the positive aspects of the system – “Free and Easy Parking”, “Visit Downtown and Parking Is On Us”, etc.
- Use consistent signage and other branding tools to “tie the system together”.

SMART PARK

ParkiT™

EasyPark VANCOUVER

Kimley»Horn

Branded Programs

Branding all aspects of your program into unified whole makes your program look and feel more professional.

ex.

» The EasyPark program from Vancouver is a great example of this approach.

Parking Offices as a Retail Storefront?

As the parking industry matures, our interface with our customers is evolving.

Most parking offices had a distinctly "back office" feel to them in the past.

But some programs are beginning to change everything!

» The examples to the right are:

A. The Winnipeg Parking Authority

B. The Calgary Parking Authority

ex.

A.

B.

Map It!

Having an effective and easy to read parking map is basic asset for effectively communicating with customers.

ex.

- There are many examples of quality parking maps available.
- These maps from Downtown San Jose and New Haven Conn. have detailed information about parking facilities, downtown destinations, transit alternatives etc.
- The maps can also distinguish between public and private parking facilities and provide a useful orientation to the one-way streets.

Kimley»Horn

The 30’ Rule for Garage Entry Points

First impressions mean a lot and you never get a second chance to make one! So, what you see within the first 30’ of a facility entrance sets the tone.

Make sure the first 30’ creates a positive experience!

ex.

“Where would you rather park?”

or

- Typical issues at facility entrances include:
  - Too much or poor quality signage
  - Signage and equipment in poor condition
  - Inadequate lighting
  - Dirty walls and curbs
  - Trash and debris

Kimley»Horn

Parking Receipt & Merchant Coupon!

Multi-space meters in “Pay & Display Mode” can print a 2-part receipt ticket. One part is displayed in the vehicle and the second part can be used as a merchant coupon or to receive a parking validation.

» This innovation is a good one for municipalities and merchants concerned about implementing paid parking.

ex.

Integrated Access and Downtown Marketing

Downtown Long Beach Associates (always at the cutting edge!) have integrated Parking, Transportation and Downtown Management in their new "Ride-Park-Play" web page.

ex.

» The Innovative site features an interactive parking and route planning map as well as special links to:

- Downtown Long Beach Transportation
- Downtown Dining
- Downtown Shopping
- Downtown Attractions
- Downtown Calendar of Events

Distinctive & Consistent Parking Signage

Fort Wayne, IN

» Once you have created a high standard of service in your facilities, you want your patrons to associate that level of excellence with YOUR SYSTEM – consistent and distinctive signage helps tie it all together.

ex.

Portland, OR

Boulder, CO

Boise, ID

Vancouver, BC

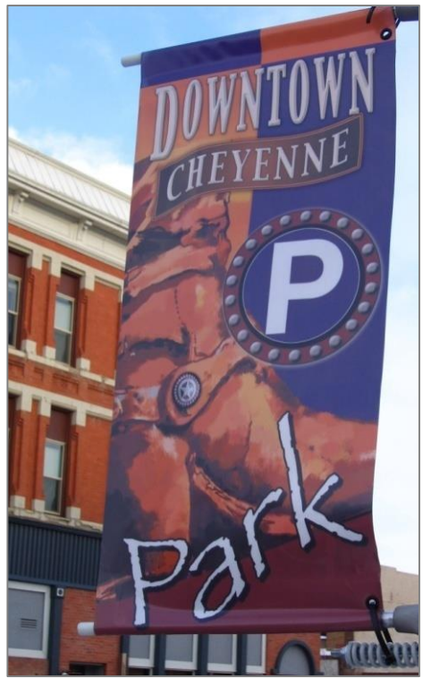
Kimley»Horn

Collaborative Promotions

Marketing dollars can go further when parking programs collaborate and co-market with other downtown organizations.

» Examples include: adding parking system info to downtown maps & brochures, banners, wayfinding kiosks, print ads, etc.

ex.



Program Marketing

Parking marketing programs that promote not only services, but their staff can be very effective. Happy and satisfied employees provide better service. Companies that provide high quality work environments provide better employees and thus better service.

ex.

- This message is not lost of Fortune 500 companies, nor on the parking industry customer service leaders.
- American Valet, based in Phoenix, AZ, has built their reputation on a strong commitment to both employee satisfaction/recognition and exemplary customer service.

Promote Local Attractions on Meter Heads

If you still have traditional single space meters, why not make the most of them?

Advertise local attractions on the meter heads.

- Downtown Denver advertises for the Denver Zoo, the Museum of Nature and Science, the Denver Art Museum and the Denver Botanical Garden.
- Free on-street parking on Sundays is also promoted.

ex.

Attention Grabbers

OK, now really, who wouldn't want to park in the "Rockstar Parking Lot"?

ex.

- "Cityplace" is located in downtown Winnipeg near the new MTA Center which hosts a variety of events including hockey, concerts, etc.
- "Rockstar Parking" is a creative, attention getting marketing strategy for their closest surface parking lot.

Bollard Sleeves

Question: What is at the entrance to almost every parking area?

Answer: Bollards!

Why not turn these ubiquitous elements into an opportunity for advertising or facility promotion?

ex.

» Eliminating unsightly rusted bollards used to require regular maintenance and even then was often unsuccessful.

» Bollard sleeves are an inexpensive and easy solution to the problem of rusted bollards. Low-density polyethylene thermoplastic sleeves slide over existing guard posts for quick and easy installation.

» A new product (pictured above) includes solar powered lights.

PARKING | The Next Level

PARKING MANAGEMENT & DESIGN - **Best Practices**

Kimley»Horn

Ch.

7

Celebrating Accomplishments

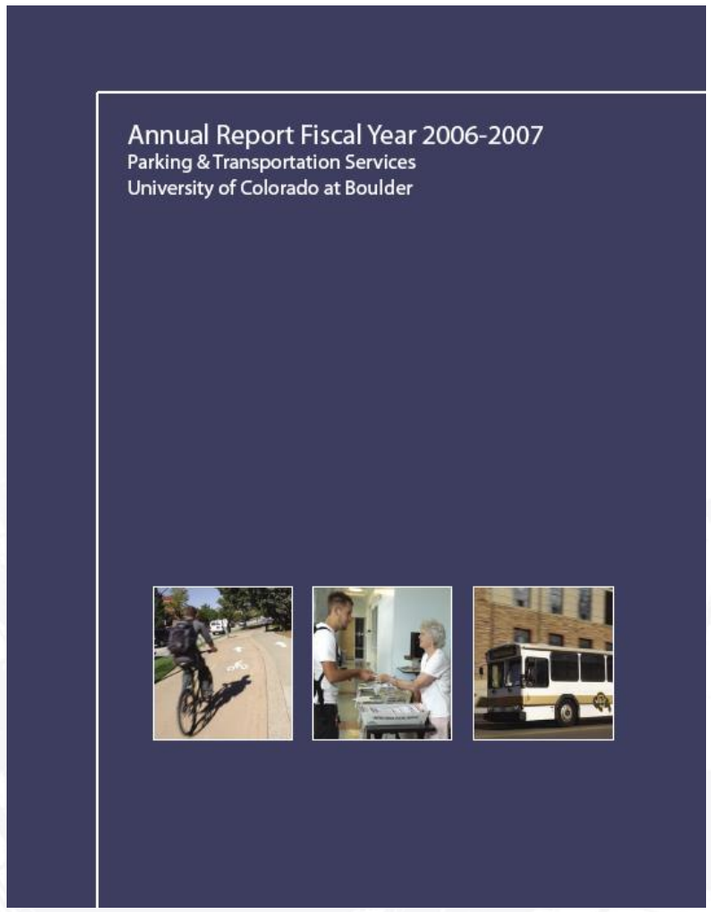
Annual Parking Reports

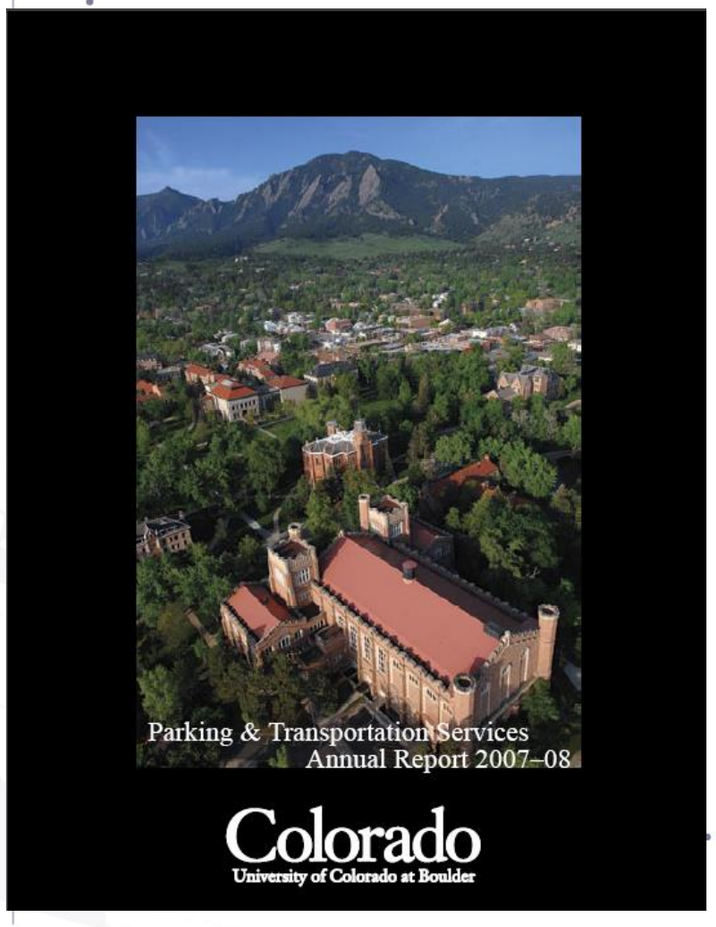
Developing an Annual Parking Report is an effective tool for communicating with both internal and external customer groups.

ex.

» Annual Parking Report Benefits:

- Identifies key departmental issues and challenges
- Promotes departmental achievements
- Documents the "state of parking"
- Builds confidence in the department
- Creates a historical record





Celebrating Program Accomplishments

The University of Washington created the piece below as part of a “strategic communications initiative”. They were facing great financial pressure and had an urgent need to raise parking rates to be able to pay for dramatic fare increases from the local transit agency.

The summary of program successes and accomplishments helped garner needed administrative support for an unpopular, but essential rate increase.

“U-PASS: 17 Years of Success - Almost 80% of the campus population -approximately 52,000 people - commutes to campus using a greener transportation mode than driving alone. One third chooses biking or walking - emissions-free commute options.”

COMMUTER SERVICES
a Transportation Services Program

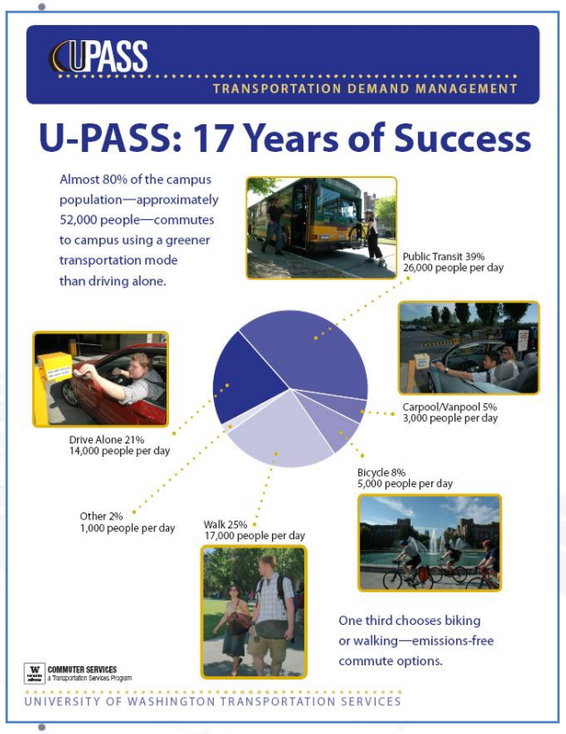
UNIVERSITY OF WASHINGTON TRANSPORTATION SERVICES

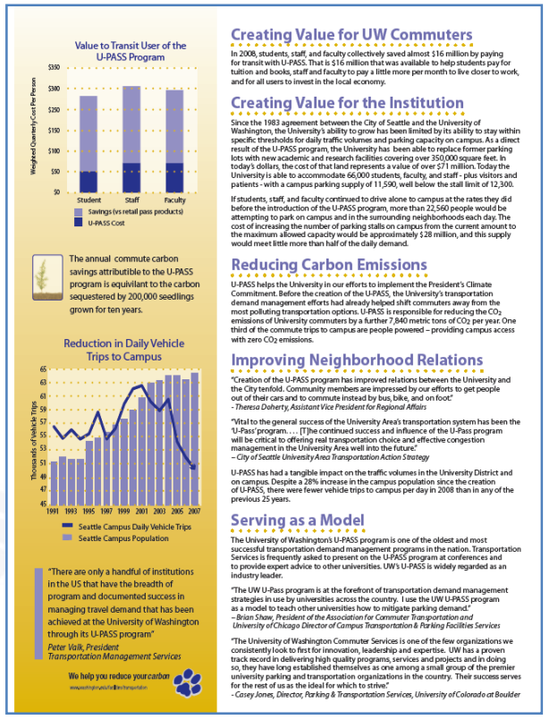
ex.

» **U-PASS: 17 Years of Success**

- Creating Value for UW Commuters
- Creating Value for the Institution
- Reducing Carbon Emissions
- Improving Neighborhood Relations
- Serving as a Model

» A component of a larger “Strategic Communications Plan”





New Facility Openings

Make Your New Facility Grand Opening An Event!

Few parking program activities are PR opportunities of this magnitude. Make the most of it!

- HOLLYWOOD -Parking at the Seminole Hard Rock Hotel & Casino in Hollywood is about to become a bit easier after the "smashing" grand opening of its brand new Winner's Way Parking Garage.
- In celebration of Wednesday's grand opening, the Seminole Hard Rock set the record for the "World's Largest Guitar Smash,".
- The 9-story "Winner's Way" garage provides an additional 2,400 covered parking spaces. It has 14 elevators, six escalators, a 351-foot-tall pedestrian bridge, a 164-foot-tall Casino bridge, and a car count system, all in a brightly lit environment.

ex.

"Parking Is A Winner At Seminole Hard Rock Hotel & Casino!"

Awards and Recognition

Been recognized for your program excellence?

Well, don't keep it a secret!

- » **Issue Press Releases**
- » **Put out Banners**
- » **Develop a Presentation**
- » **Hold a Press Conference**
- » **Write an Article**

IPI INTERNATIONAL PARKING INSTITUTE ADVANCING THE PARKING PROFESSION

The International Parking Institute Announces Winners of 2010 Awards of Excellence Competition

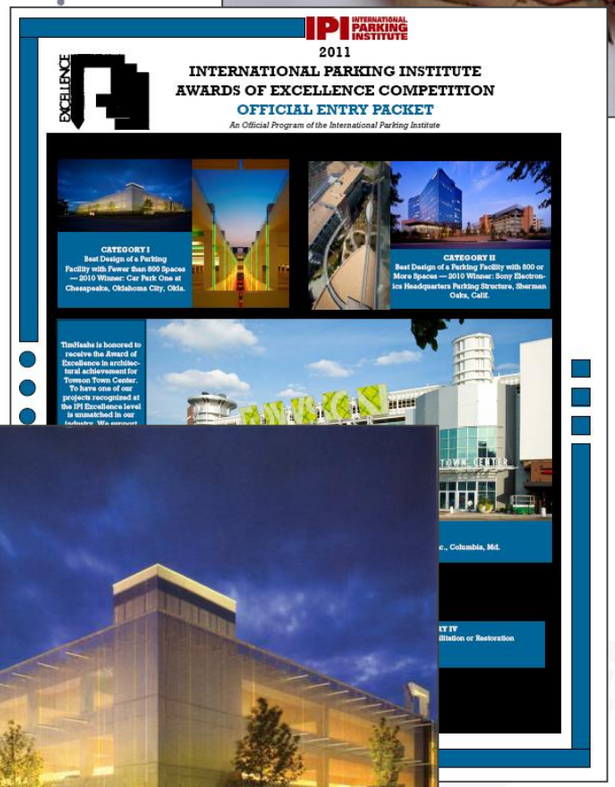
Award of Excellence: University of Colorado, Boulder - Sustainability, Parking & Transportation, Boulder, Colo
University of Colorado at Boulder, Parking and Transportation Services

Project Team:

- University of Colorado, Boulder, Parking & Transportation Services, Boulder, Colo
- University of Colorado, Boulder, Environmental Center , Boulder, Colo

The University of Colorado, Boulder, is frequently recognized as one of the nation's greenest, in large part due to its Parking and Transportation Services. Despite a growing number of commuters, the campus continues to reduce its carbon impact through better use of scarce parking resources. Its Ecopass program provides free public transportation for employees, freeing over 1,000 parking spaces. The addition of more than 1,300 bike parking spaces in the past two years means that bike parking and vehicle parking spaces have reached parity. Two existing garages were renovated to reduce energy consumption; a third garage under construction will include electric vehicle charging stations.

ex.



Worst Parking Awards?

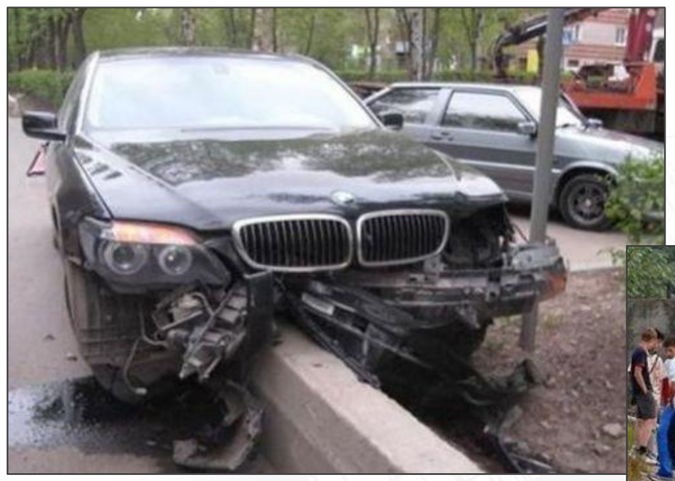
Looking for a little attention?

People love to talk and complain about parking.

Tap into our natural fascination with parking by creating your own local awards program!
(Something tells me there is no shortage of potential entries!)

Maybe the:

"Worst Parking Award" or
"Most Creative Parking Award".



ex. » You might even celebrate diversity with a "Multi-Cultural Parking Award" – (Here's my entry!")

Conference Presentations

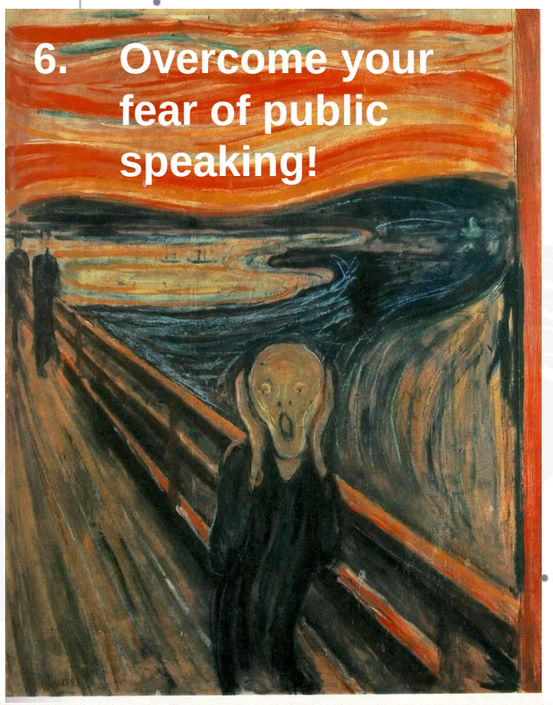
Giving back…

Share your successes and innovative ideas with your peers and in the process enhance your reputation and the prestige of your program and institution.

» **The 6 Benefits of Conference Presenting**

1. Recognition as an expert
2. Time away from the office
3. Acknowledgement of your accomplishments
4. Collaboration with your peers
5. Hone your communications skills and……

ex.



Media Relations/ Media Kit

One benefit of doing an Annual Parking Report is that it can be a great start on developing your parking program “media kit”.

Parking Media Kits might include:

- System/Facility fact sheets
- Statistical Info
- Comparative Info
- Photos
- Video Footage
  - Facilities, staff doing their jobs, etc.
- Bios of Key Staff

Develop the Media Kit “before a crisis”

- On your time table

ex.

Media Relations Tips:

- Make friends with local Media
- Keep your message simple
- Provide resources – visuals, photos, plans, stats
- If hosting a press event – keep presentation short
- No more than 5 minutes
- Then open it up for questions
- Have a written “press release”
- Have a copy available for reporters

Anniversaries

Don’t Forget Your Anniversary!

Program anniversaries are a natural opportunity to reflect back on your progress and celebrate your accomplishments!

» **3 Ideas for your celebration:**

1. Offer “free parking for a year” to one lucky person
2. Have a water balloon accuracy dropping contest from the roof of the garage
3. Bake a cake in the shape of parking deck!

ex.

Happy 75th Anniversary Parking Meter !

Kimley»Horn

Ch. 8

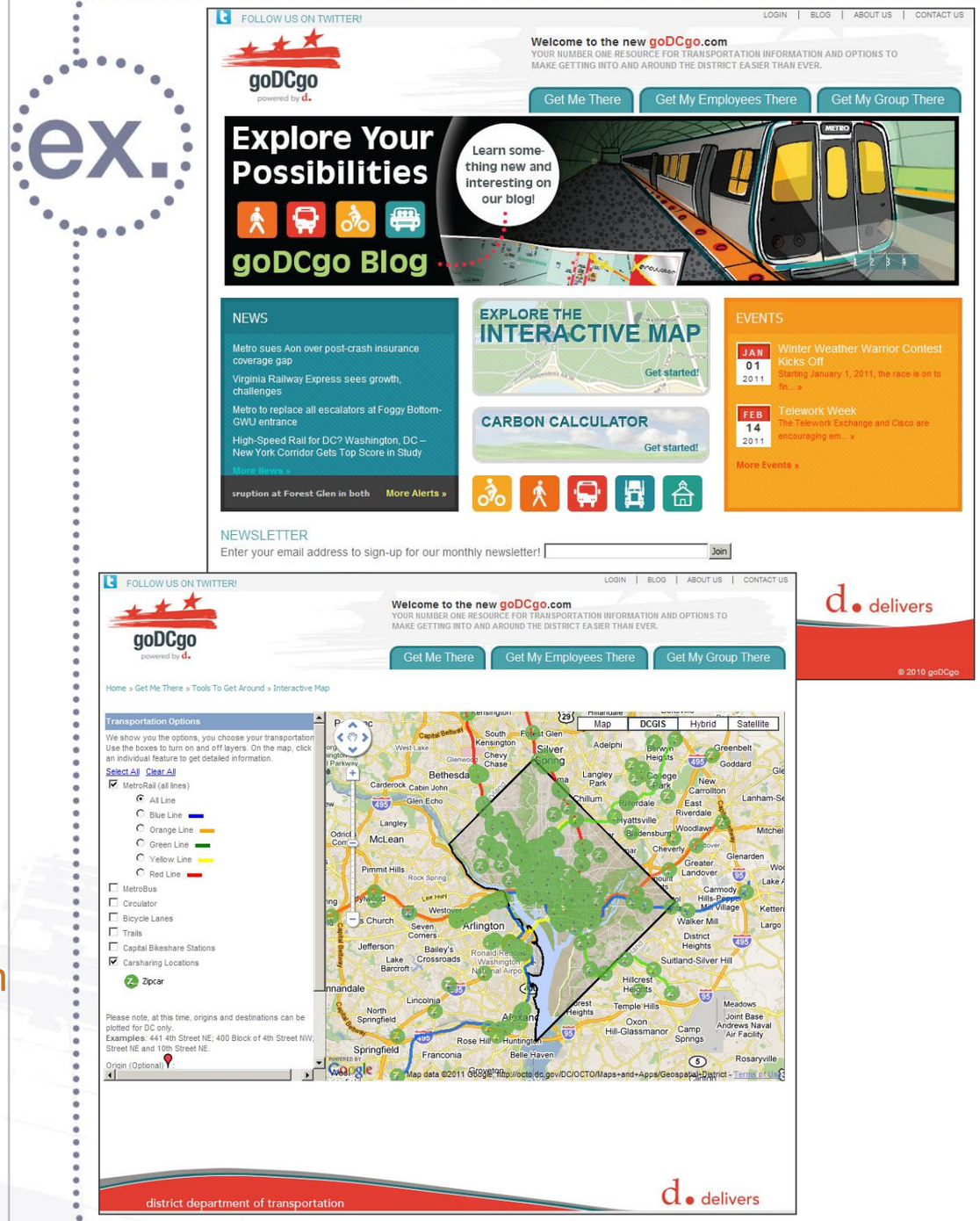
The Virtual Environment

The Virtual Environment

Let's face it, the internet has changed everything! (and mostly for the good!)

This has forced us to come to terms with the fact that we have a new "virtual environment" that needs to be carefully designed, managed and maintained.

- Our "Web Presence" says a lot about our organization
- It is often the first point of contact with our programs
- It can be an incredibly valuable tool for information dissemination, but it must be kept current
- Parking is typically not "front and center" on institutional home pages. How easy is it to find your program information?
- One of favorite sites from a transportation perspective the "go DC go.com" site



Flash Based Mapping Programs

Flash based mapping programs provide the ability to map out walking routes from parking locations on campus to specific destinations and could also be translated to walking times.

ex.

» Visit www.wisc.edu to see an example of this technology application.

- Click on the “Campus Map”
  - Ruler feature.

Recommended Website Elements

Website development has come a long way!

We now have a wide variety of tools and other webpage elements to choice from.

Some parking specialty items include:

- Carbon reduction calculators
- Parking facility construction cost estimator
- Ask the consultants

Some other favorites to consider include:

» News & Events

» Maps

» Events Calendars

» Construction Updates

» Did You Know?

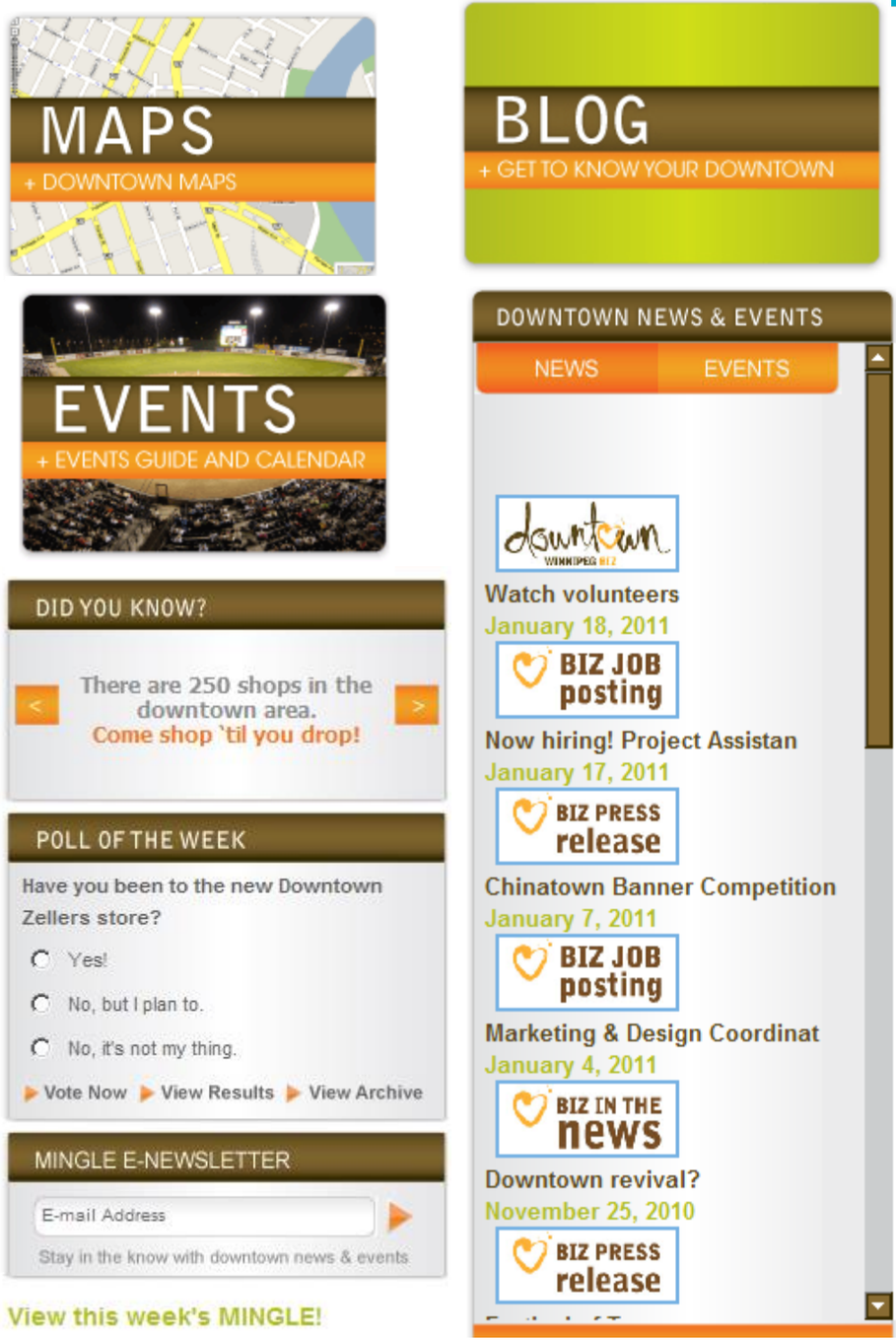
» Weekly Polls

» Program FAQs

» Links to other sites/resources

» Job postings

ex.

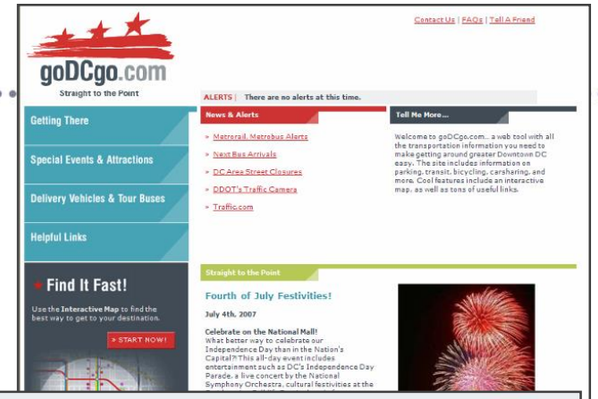


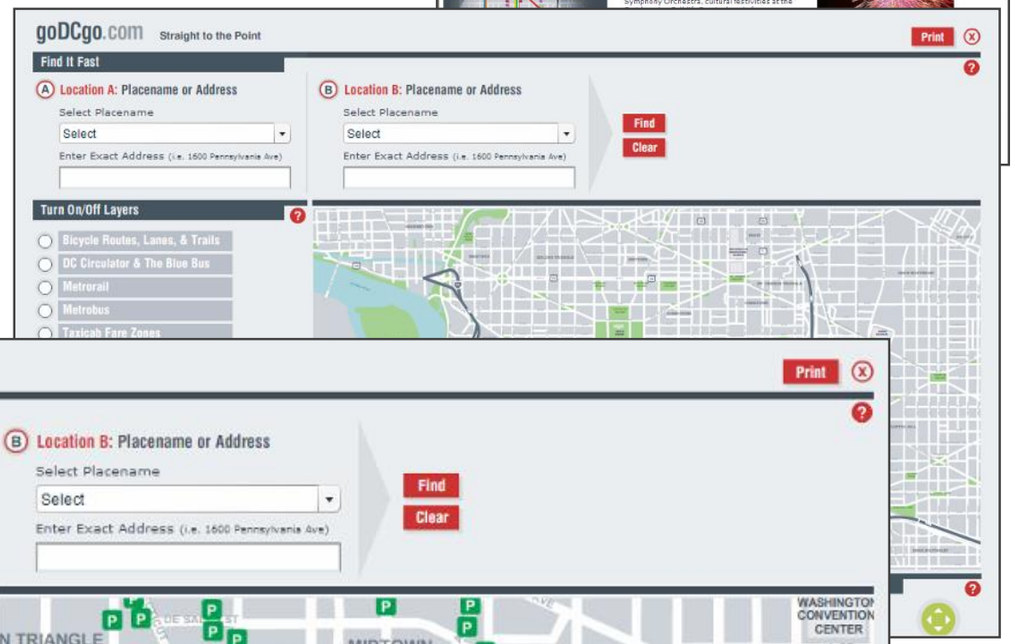
Best Parking Website Features – Interactive Maps

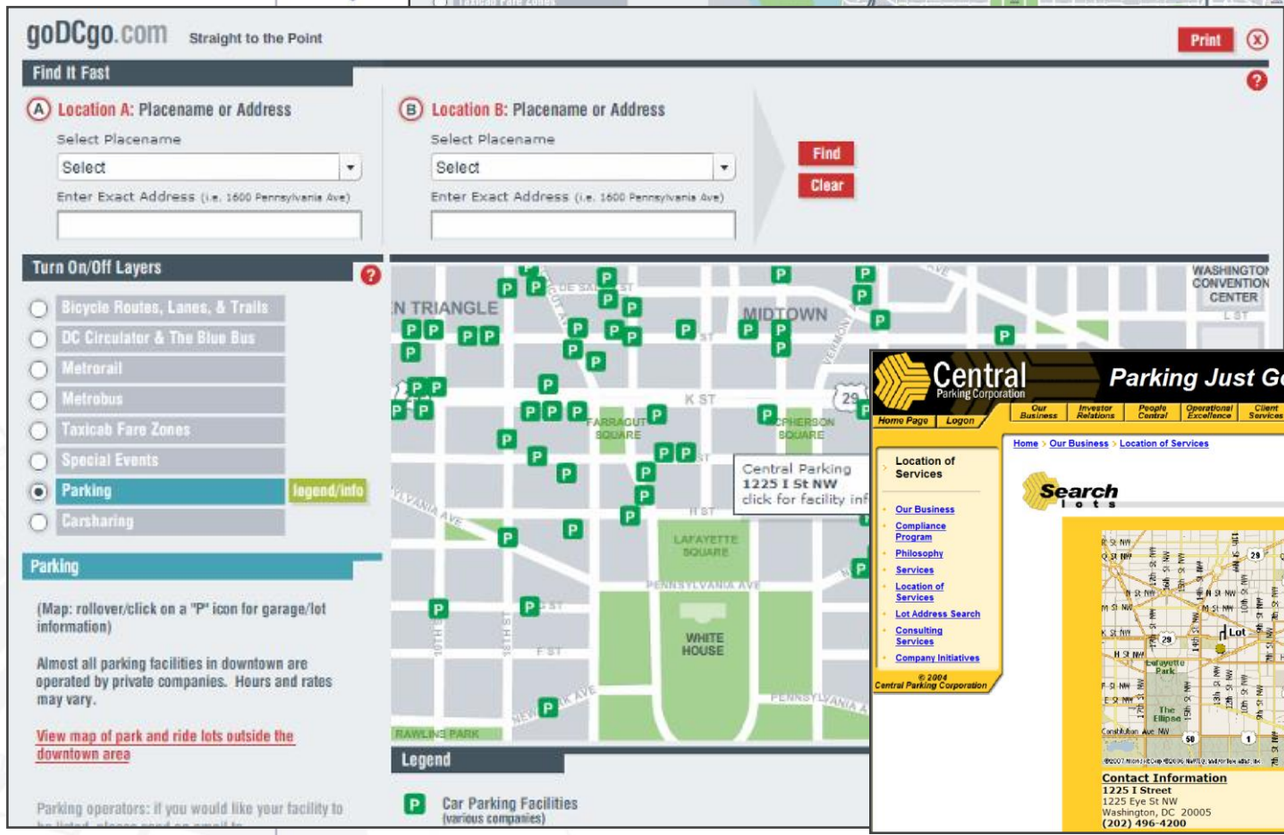
On the “Go DC Go.com” interactive web-site map, by turning on the parking “layer” you can not only identify the location of various parking facilities, but also drill down to very detailed information about facility management, services offered, hours of operation, rates, etc.

» At the most detailed level, the data is just a link and detailed info is managed by the site owner, such as **Central Parking** in this example.

ex.







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Best Parking Website Features – Parking Locators

Interactive web-site maps that allow you to turn on “layers” to relate various features is a very valuable parking and downtown web-site feature.

Examples of specialty transportation related layers include:

- Parking
- Bike Share Stations
- Transit Stops
- Circulator Stops and Routes
- Car Share Locations

Some other “layers could include:

» Attractions
» Major Buildings
» ATMs
» Restaurants
» Retail
» Government Facilities
» Art Galleries
» Coffee Shops

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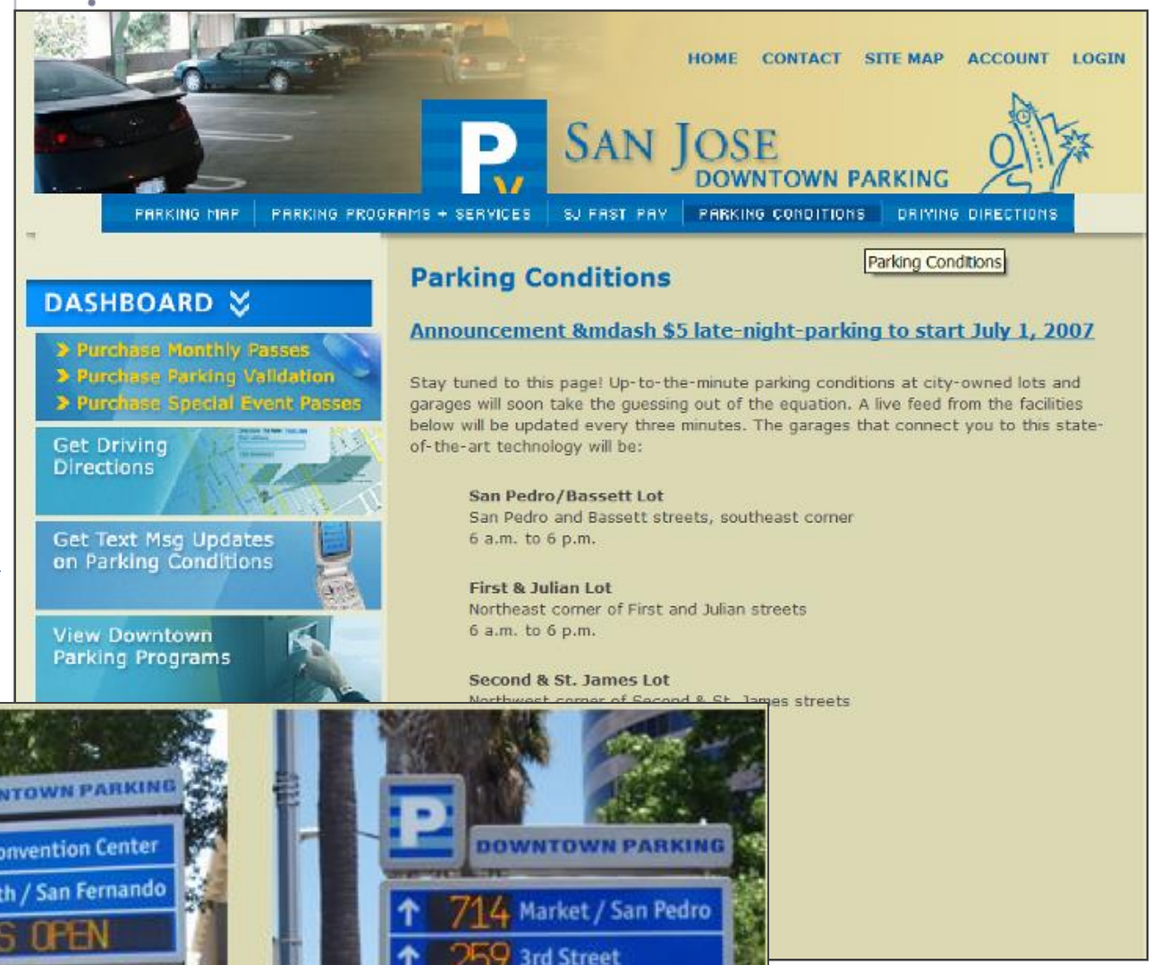
Best Parking Website Features – Parking Conditions Updates

The San Jose parking website offers a page that keeps customers informed of “current conditions” related to city operated parking facilities”.

- You can even sign up to get “parking condition updates” sent directly to your cell phone via text message.

- San Jose is also on the leading edge with parking guidance signage systems with real-time information.



Market Street

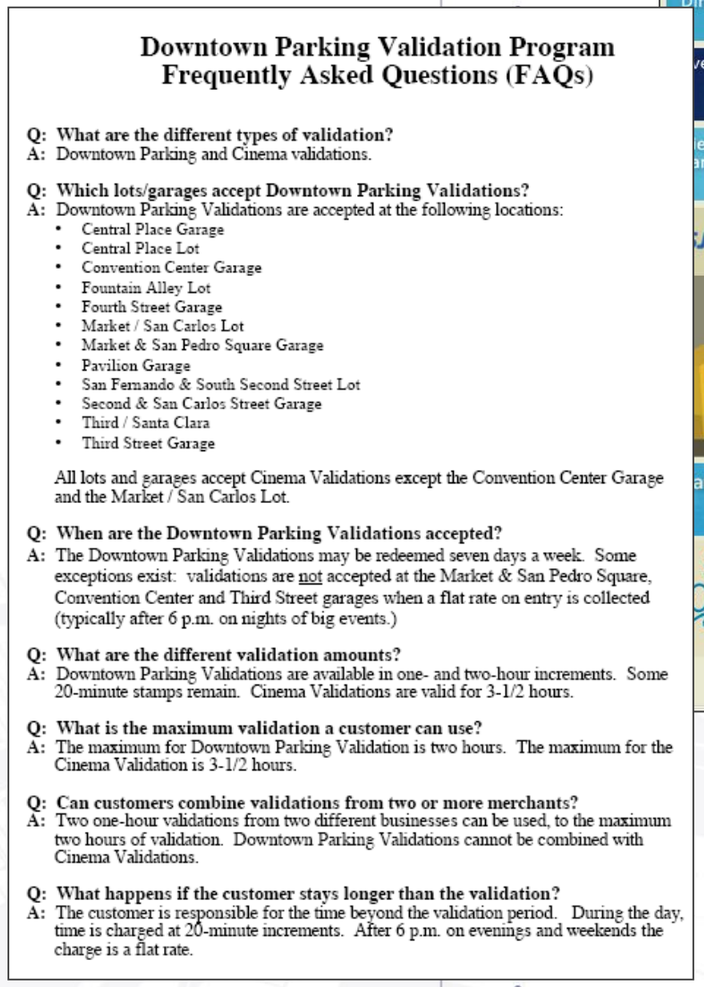
Santa Clara Street

Best Parking Website Features – FAQs

Many websites recognize that there are a variety of "commonly asked questions".

An FAQ (Frequently Asked Questions) section can be a helpful addition to many customers and reduce the number of phone calls your office staff has to answer.

ex.



Downtown Parking Validation Program
Frequently Asked Questions (FAQs)

Q: What are the different types of validation?
A: Downtown Parking and Cinema validations.

Q: Which lots/garages accept Downtown Parking Validations?
A: Downtown Parking Validations are accepted at the following locations:

- Central Place Garage
- Central Place Lot
- Convention Center Garage
- Fountain Alley Lot
- Fourth Street Garage
- Market / San Carlos Lot
- Market & San Pedro Square Garage
- Pavilion Garage
- San Fernando & South Second Street Lot
- Second & San Carlos Street Garage
- Third / Santa Clara
- Third Street Garage

All lots and garages accept Cinema Validations except the Convention Center Garage and the Market / San Carlos Lot.

Q: When are the Downtown Parking Validations accepted?
A: The Downtown Parking Validations may be redeemed seven days a week. Some exceptions exist: validations are not accepted at the Market & San Pedro Square, Convention Center and Third Street garages when a flat rate on entry is collected (typically after 6 p.m. on nights of big events.)

Q: What are the different validation amounts?
A: Downtown Parking Validations are available in one- and two-hour increments. Some 20-minute stamps remain. Cinema Validations are valid for 3-1/2 hours.

Q: What is the maximum validation a customer can use?
A: The maximum for Downtown Parking Validation is two hours. The maximum for the Cinema Validation is 3-1/2 hours.

Q: Can customers combine validations from two or more merchants?
A: Two one-hour validations from two different businesses can be used, to the maximum two hours of validation. Downtown Parking Validations cannot be combined with Cinema Validations.

Q: What happens if the customer stays longer than the validation?
A: The customer is responsible for the time beyond the validation period. During the day, time is charged at 20-minute increments. After 6 p.m. on evenings and weekends the charge is a flat rate.

Web-based Parking Locators

Searchable Parking Locator Map features on websites allow customers to zoom in on their areas of interest and get detailed parking location, contact info, maps, cost and sometimes parking availability information.

ex.

» Visit www.greenP.com to see an example of this website feature.

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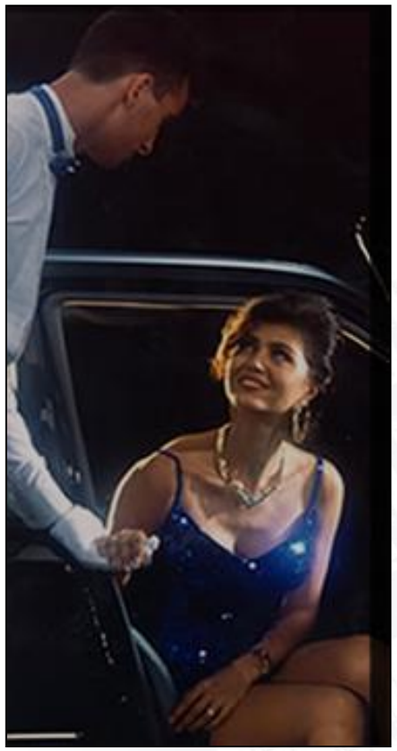
Improving Customer Service

Quality Customer Service Programs

"Best in Class" parking programs have well defined customer service programs that typically include vehicle lock out assistance, dead battery assistance and vehicle location assistance at a minimum.



ex.

» Other key customer service areas include:

- Focus on employee training and hiring practices.
- Develop friendly, attentive, outgoing knowledgeable attendants.
- Increase personal contact between parking system manager, stake holders & customers.
- Institute performance measurements and utilize for company and employee incentives.
- Develop customer friendly payment options.

Quality Customer Service Programs Begin with Training

Excellent customer service is never an accident. It is a result of a defined prioritization by management, a dedication to making guests feel special and an investment in training.

ex.

IPI INTERNATIONAL PARKING INSTITUTE ADVANCING THE PARKING PROFESSION

MEETINGS & EVENTS | MEMBERSHIP SERVICES | PUBLICATIONS | PROFESSIONAL DEVELOPMENT

HOME PAGE > PROFESSIONAL DEVELOPMENT > ON-SITE TRAINING PROGRAMS

On-Site Training Programs

Employees are an organization's most valuable asset. An investment in staff training and education brings a high rate of return in job performance and satisfaction.

For more information, contact Lauri Chudoba at chudoba@parking.org or 540.371.7535.

Customer Service Training

Conflict Resolution Training

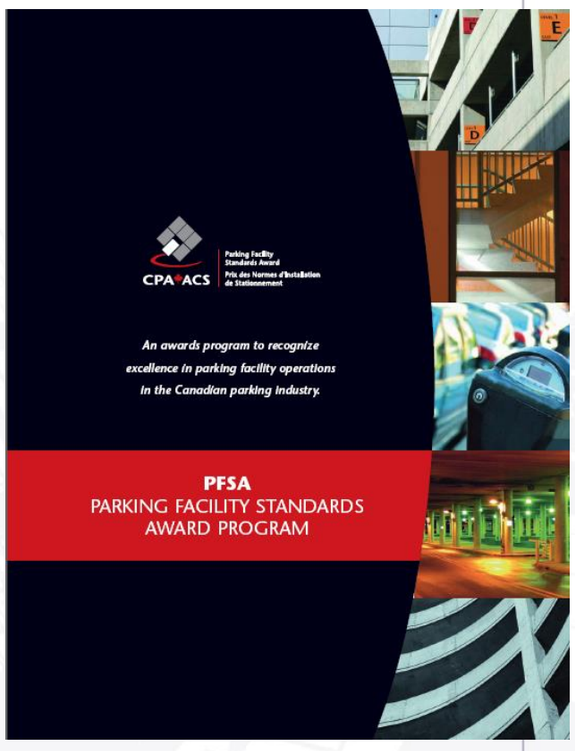
Customer Service Amenities –

A Requirement for Canadian Parking Association Certification

Canadian Parking Association
Association canadienne du stationnement

ex.

Customer amenities provided by the Winnipeg Parking Authority.



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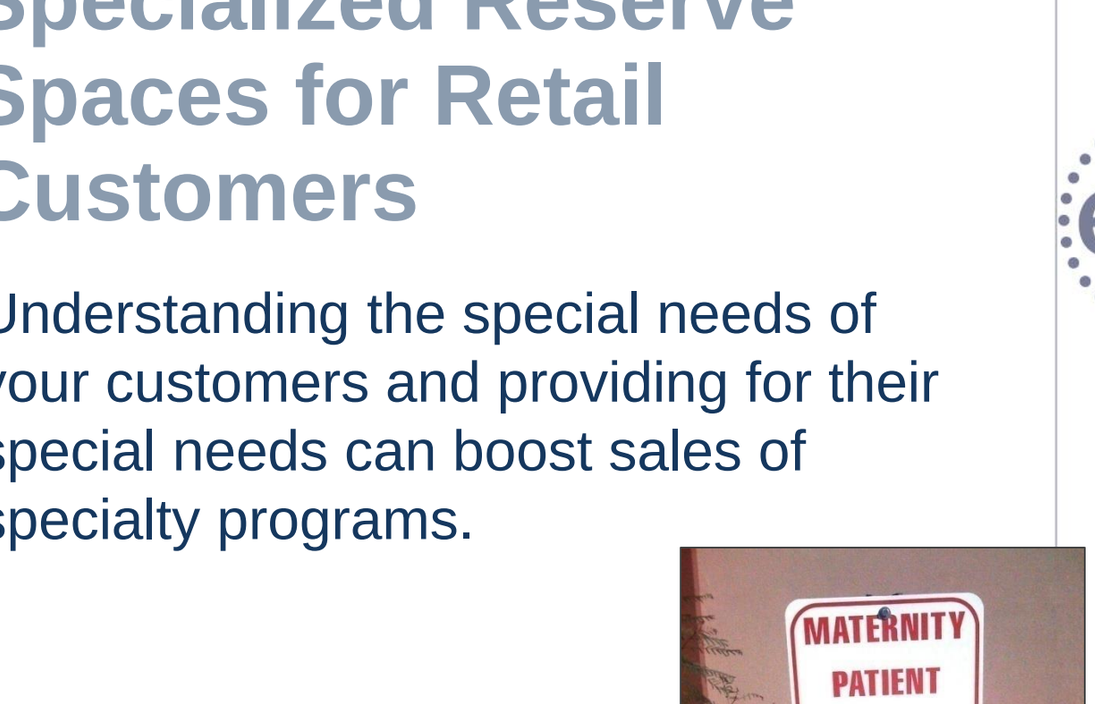
Specialized Reserve Spaces for Retail Customers

Understanding the special needs of your customers and providing for their special needs can boost sales of specialty programs.



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» Examples include:

- Short-term spaces for quick turn-over customers such as “Coffee Customers”
- Quick and convenient “run–in / run-out” spaces for pre-prepared meal customers.
- Close-in, convenient spaces (generally next to accessible spaces) reserved for “Expectant Mothers”.

Lincoln's "Shopper Zones"

Reserving the most convenient off-street parking spaces for retail customers, Lincoln's new "Shopper Zones", takes this best practice to a new level!

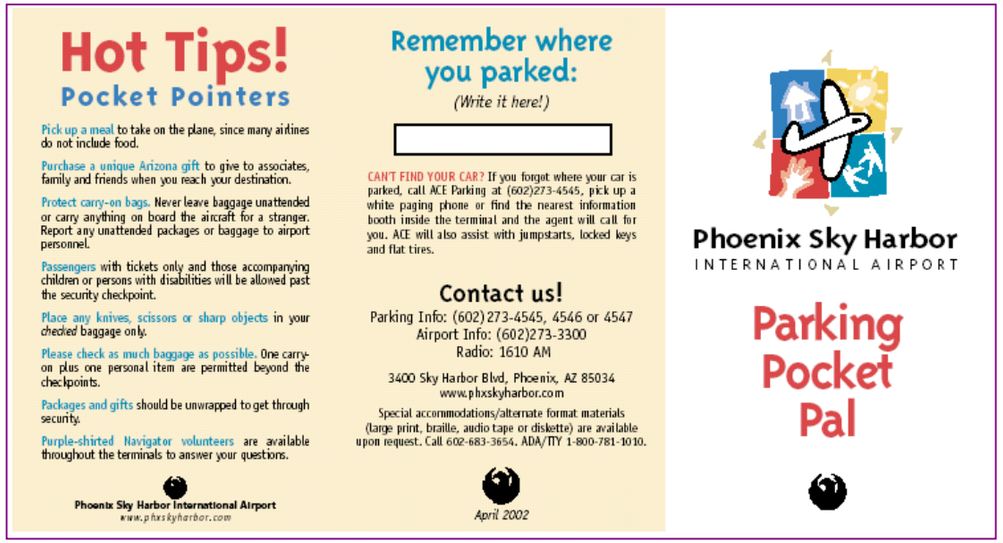
ex.

Parking Orientation Tools

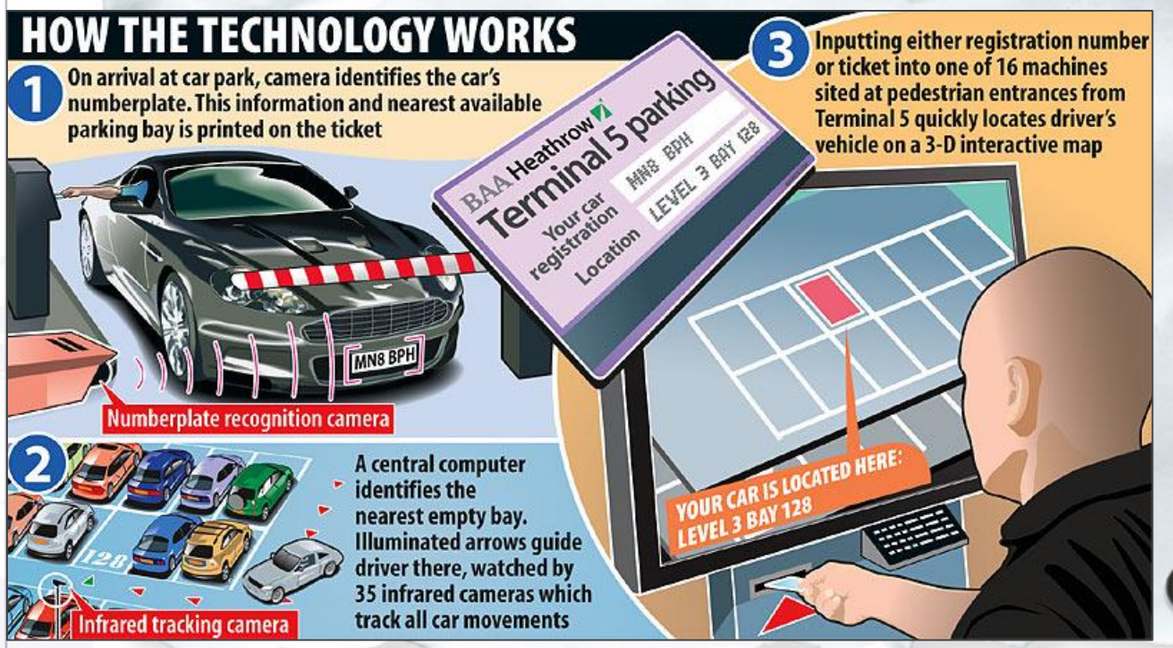
Many facilities place “You parked on Level ___” cards at the elevator lobbies for patrons to take with them.

ex.

» London’s Heathrow Airport uses LPR technology to make finding your car even easier!



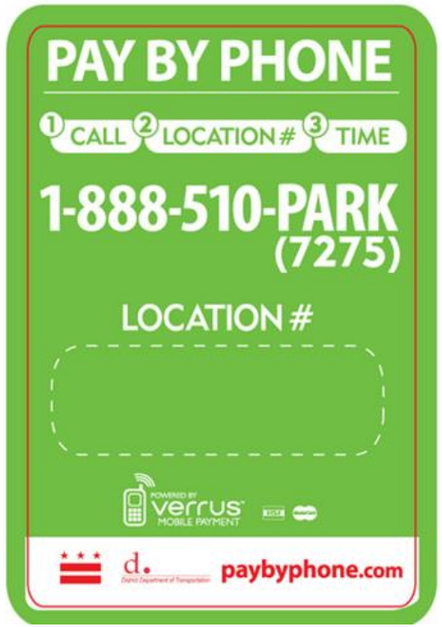
» Other systems have developed “Parking Pocket Pal” mini-brochures to provide orientation and parking services information to customers.



Enhanced Payment Options

One area that we can use to improve customer service in the parking world is to make “paying for parking” as easy and painless as possible. Because, let’s face it, nobody LIKES to pay for parking. But if is difficult to pay, that just makes it worse!

ex.



Improved payment options include:

- Cash/Coin
- Credit/Debit Card Acceptance
- Community Cards (Debit)
- Cash-Key
- Pay-By-Cell Phone
- Pay-Pal (On-Line)
- Toll Tags
- “Sky Meter”

If accepting credit or debit card payments, be sure your systems are PCI certified!

PARKING | The Next Level

PARKING MANAGEMENT & DESIGN - **Best Practices**

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Customer & Community Education

"Coffee with the Parking Guy"

The Winnipeg Downtown BIZ sponsored "Coffee with the Parking Guy"!

As a service to it's membership the BIZ would host monthly meetings connecting retailers, restaurateurs and other downtown business owners at a local coffee shop to the Winnipeg Parking Authority's chief administrator (& IPI's Parking Professional of the Year in 2010!).

ex.

- This simple, but effective outreach strategy worked well in Winnipeg because of their smart and savvy parking administrator.
- Discussion were lively and sometimes a little intense. People can get passionate over parking.
- But in the end, it was a valuable learning experience and the educational benefits went in both directions.

Mr. David Hill, CAPP
IPI's 2010 "Parking Professional of the Year"

How To Park in Any City, USA

Having a succinct and accessible document that informs your customers "How to Park" is just good basic management.

DOWNTOWN CHAPEL HILL PARKING

PUBLIC PARKING LOTS

There are 675 off-street parking spaces in Town-managed lots.

- Rosemary/Columbia Parking Lot (Formerly Lot 2) (A)
  100 E. Rosemary St.
- West Rosemary Parking Lot (Formerly Lot 4) (B)
  104 W. Rosemary St.
- 127 W. Rosemary Lot (C)
  127 W. Rosemary (leased parking only)
- Wallace Deck at Rosemary (D)
  150 E. Rosemary St.
- Rosemary/Church Street Parking Lot (Formerly Lot 5) (E)
  108 Church St. & 141 W. Rosemary St.
  (will close in Fall 2010 for construction of 140 West)
- West Franklin Parking Lot (Formerly Lot 3) (F)
  415 W. Franklin St.
- West Franklin/Basnight Parking Lot (G)
  113/114 N. Basnight Lane (new)

LEASED PARKING

The Town leases parking spaces for $85/month. For more information, call (919) 968-2758.

FREE PARKING

After 8 p.m. Saturday, parking is free at the West Franklin Lot (415 W. Franklin St.) and Rosemary/Church Street Lot (141 W. Rosemary St.)

Also, you are not required to pay for parking meters after 6 p.m. Monday through Saturday. All parking lots and meters are free all day Sunday.

Meters are not enforced on the following Town holidays: Martin Luther King Holiday, Good Friday, Memorial Day, Fourth of July, Labor Day, Thanksgiving, Christmas and New Year's Day. Parking in all metered municipal lots is also free on these holidays; the Rosemary/Columbia Lot and the Wallace Deck are open for paid parking on Martin Luther King Jr. Day and Good Friday.

The Town is testing the use of multi-space parking meters on the 100 and 300 blocks of Franklin Street.

Yes, they accept credit card payments!
Take our survey at
www.townofchapelhill.org/parking

ON-STREET PARKING

There are more than 250 on-street metered parking spaces within Chapel Hill. Most spaces are in the central business district and charge 25 cents for 15 minutes with a 2-hour limit. Meters accept quarters and dimes only.

- Meters are enforced 8 a.m. to 6 p.m. Monday through Saturday. Metered parking is FREE after 6 p.m. daily and all day Sunday.
- Meters in the Cameron Avenue zone have a 4-hour time limit.
- Fines for Expired Meter, Beyond Time Limits, or Outside Marked Lines in metered zones are $15.

PARKING LOT RATES

Hours: 7:30 a.m. – 1:15 a.m. Monday to Thursday;
7:30 a.m. – 3:15 a.m. Friday;
9:30 a.m. – 3:15 a.m. Saturday;

Wallace Deck – 150 E. Rosemary St.
Rates: $.50/half hour for 0-4 hours;
$1/hour for 4-17 hours

Rosemary/Columbia Parking Lot – 100 E. Rosemary St.
Rates: $.65/half hour for 0-4 hours;
$1.30/hour for 4-6 hours;
$1.80/hour for 6 hours or more

Weekend evening fee: $5 after 8 p.m. Friday – Saturday (Includes Thursdays during UNC academic term).

Limited discounts to senior citizens and people with disabilities are available.

Time Limit: 24 hours

PARKING TICKETS

COURTESY TICKETS

Under our courtesy ticket system, first-time parking offenders who receive tickets for on-street metered parking violations may have their tickets waived. The goal of the courtesy ticket program is to ensure that the downtown is friendly to our visitors and business customers.

PARKING FINES

- Expired meter $15
- Parking over marked lines $15
- Parking in a handicap zone $200
- Parking within 15 feet of fire hydrant.....$100
- Parking within fire lane $100
- Other violations $50

Late Fees: $10 for 21 days after issuance and an additional $10 for each subsequent 14-day period, up to $20.

PAYING YOUR TICKET

Enclose the citation with a personal check, money order or cashier's check (do not send cash). Make checks payable to Town of Chapel Hill. Mail to Town of Chapel Hill Parking Services, 150 E. Rosemary St., Chapel Hill, NC 27514. Payments are accepted from 8:30 a.m. to 5 p.m. Monday to Friday at the Parking Services office, or by phone at (919) 932-2912. Payments may also be deposited in the Town's drop-box locations at Chapel Hill Town Hall, 405 Martin Luther King Jr. Blvd., or the Police Department, 838 Martin Luther King Jr. Blvd.

IF YOU LOSE YOUR TICKET

Paying your ticket is still your responsibility. Visit Parking Services in person or phone (919) 932-2912. license plate number or the name of her available.

TICKET

mit an Appeals Form within 21 days of are available from Chapel Hill Parking at www.townofchapelhill.org/parking.

TOWED OR IMMOBILIZED?

IMMOBILIZED VEHICLES

Vehicles illegally parked within the Town that have four or more outstanding parking citations are subject to having an immobilization device (commonly referred to as a "boot") attached to their vehicle.

REMOVING THE IMMOBILIZATION DEVICE

In order to have the device removed, please come to the parking office at 150 E. Rosemary St. between 8:30 a.m. and 4:30 p.m. Monday through Friday to settle the account and pay the $55 booting fee. Vehicles not claimed prior to 4:30 p.m. are subject to towing.

TOWED VEHICLES

It is rare for the Town of Chapel Hill to tow vehicles, but towing will be enforced when:

- Vehicles are parked in hazardous locations
- Vehicles are parked for more than 24 hours in a Town owned lot
- Vehicles have been booted and have not been released before 4:30 p.m.
- Vehicles have been booted on two or more occasions and owners have failed to settle their account.

RETRIEVING YOUR VEHICLE

Towed vehicles may be reclaimed from the vehicle impoundment area upon payment of the towing fee. In order to have your vehicle released, please go to the Chapel Hill Police Department, 828 Martin Luther King Jr. Blvd. Payment of the towing fee does not remove responsibility for the ticket that caused the tow or any outstanding, unpaid or overdue parking tickets.

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publicaffairs@townofchapelhill.org
Printed on recycled paper.
Please recycle with white paper.

PARKING DOWNTOWN

The Parking Services office is located in the Wallace Parking Deck.
Open 8:30 a.m. - 5 p.m. Monday to Friday, except holidays.

150 E. Rosemary St.
Chapel Hill, NC 27514

Information: (919) 968-2758
Residential Permits & Citations:
(919) 932-2912
Fax: (919) 932-2926
E-mail: parking@townofchapelhill.org
Web: www.townofchapelhill.org/parking

Typical contents might include information on:

- » Office Location/Contact Info
- » Parking locations
- » Rates
- » On-Street Parking
- » Enforcement/Adjudication
- » Towed/Immobilized Vehicles

Howdy Pardner!

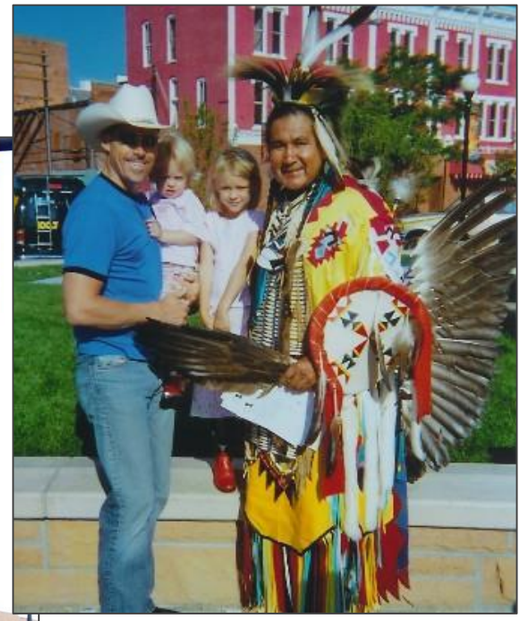
The “real problem” from a parking management perspective re: on-street parking is repeat offenders trying to take up what should be a short-term space for their longer term needs.

If this is true, why not make the penalty for occasional or first-time violators less harsh to mitigate the inherent negativity of parking enforcement.

ex.

- Why not take it one step further and let the first parking citation be an educational opportunity?
- That’s what they did in Cheyenne, WY with their innovative “Howdy Pardner!”program.
- This is one strategy to better align parking policy with the goals of creating a vital downtown.

Cheyenne Frontier Days



» Using creative marketing Cheyenne crafted a parking citation envelope to be an educational piece that led off with the phrase “Howdy Pardner”.

» Message #1: Welcome and Thanks for Shopping Downtown!

» Message # 2: Need more than 2 hrs.? Here are some longer term parking options and other tips on how to parking legally in Downtown Cheyenne.

Secrets to Parking Success!

The collaborative effort between the Downtown Winnipeg Business Improvement Zone (BIZ) and the Winnipeg Parking Authority is aimed at helping you get around downtown easily by car, bike, bus and on foot.

» Getting around downtown and parking is easy with 32,000 parking spots, the free Downtown Spirit shuttle bus, 2 kilometres of indoor walkways, dozens of bus stops, and many bike racks.

ex.

BLUE LOONIE FOR You!

WINNIPEG $ DOWNTOWN

THANK YOU FOR VISITING DOWNTOWN!

USE THIS EASY STREETS™ BLUE LOONIE FOR:

- $1 off parking at street meters and most downtown parking lots
- Full bus fare
- $1 off participating taxis, Handi-Transit and the Splash Dash Water Bus

Ask for your Blue Loonie at participating businesses (see back) when you spend $20 or more (before taxes or tip).

FOR MORE TIPS ABOUT BLUE LOONIES AND DOWNTOWN PARKING, REVIEW THIS GUIDE OR VISIT WWW.DOWNTOWNWINNIPEGBIZ.COM

Enjoy your time downtown!

A fresh APPROACH TO DOWNTOWN PARKING

EASY STREETS

SECRETS TO PARKING SUCCESS

PLAN BEFORE YOU GO

- Check out a few options for parking before you leave.
- Have a first and second choice parking location.
- Keep spare change close at hand to use in meters.
- If you don't have change, the new parking meters and many parkades take credit cards.

LOCATING YOUR PARKING SPOT

- Beat the rush.
- Attending an event at the MTS Centre or elsewhere in downtown? Come early for a bite to eat or to shop, and secure that parking spot well in advance.
- Staying a while? Take your time, but choose a parking lot.
- Think you might be longer than one or two hours? Going to a medical appointment that might keep you waiting? Choose a parkade or parking lot.
- Don't get caught in the red! Time's up, time to move.
- All on-street meters are limited to one or two hours on weekdays between 9:00am and 5:30pm. That means you have to move your car after the allotted time has expired (you can't plug the meter again!)

ONCE YOU'RE THERE

You've successfully parked downtown. Now what?

- Park for the day and get around another way.
- Take advantage of the Free Downtown Spirit shuttle bus to get around the city centre and back to your car when your day's done.
- Stay high and dry.
- Avoid sleet and snow by parking indoors and using downtown's walkway system. You can get from Portage & Main to The Bay without ever stepping outside!

ALTERNATIVES TO PARKING DOWNTOWN

- Park and ride.
- Park at one of Winnipeg Transit's 12 Park and Ride locations and hop on a Direct bus downtown. For a map, visit www.winnipegtransit.com/main/parkandride.jsp
- Shop at an Easy Streets retailer and ask for a blue loonie, which will cover your bus fare back to your car.
- Leave your car at home!
- Hitch a ride with a friend and carpool to downtown.
- Travel on foot or by bike or bus.

PARKING MYTH:
I ALWAYS have to pay a Fortune for parking downtown.

BUSTED:
There are many ways to save on downtown parking... and even park for free!

PARKING ON A BUDGET

Paying for parking is a reality in most cities' downtowns. But there are a few tricks to save on parking.

- Come downtown after 5:30pm on weekdays and park for free on the street, or at a reduced rate at most lots.
- Free weekends at street meters.
- Saturdays: park free for two hours at all street meters—even if it's a one-hour meter (9:00am-5:30pm). But after two hours, you'll need to move your car.
- Sundays & Holidays: free all day long.
- Watch for meters at The Forks and the Promenade behind Portage Place. Since they're not run by the City, they have different hours.
- Call your destination before you leave and ask if they have visitor parking or validated parking. Locations offering validated parking include Portage Place, IMAX Theatre, Globe Cinema, The Bay and others (validated parking policies vary).
- Ask for your blue loonie after spending $20 or more at Easy Streets businesses.
- Park a few blocks or take downtown and walk or bus in.
- Check loading zones for time and/or day limited designation. You can actually park (for free) in some loading zones on evenings and weekends.

The Inside Scoop
PARKING PATROLS SPEAK UP

"There's lots of parking downtown, but it takes a bit of research to know where to find the bargains. It's best to park in a surface lot or parkade if you're going to be a while; on-street parking space is dedicated to short-stay parking only. Please drive safely and park courteously, and call us if we can help. Our patrol staff are happy to point out the regulated areas, and explain where you can leave your vehicle safely, for as long as you wish."

David Hill, Chief Operating Officer, Winnipeg Parking Authority

WHAT PARKING PATROLS REALLY WISH YOU KNEW

- "No Stopping" signs mean no stopping. No ifs, ands or buts!
- Loading zones are meant for loading.
- You can park in a loading zone for 15 minutes to dash into a business or to pick someone up. No need to use your hazards.
- If there is constant loading/unloading activity, a vehicle can be at a loading zone for longer than 15 minutes.
- Back lanes need to be kept clear for safety reasons, but can be used for short-term loading.
- Let the rush flow!
- Rush hour restrictions help traffic flow in and out of downtown, 7:00am to 9:00am and 3:30pm to 5:30pm. Watch for no stopping zones and no parking meters during rush hour times.

PARKING MYTH:
Parking Patrols stake out my car, waiting for my meter to expire before slapping a ticket on it.

BUSTED:
In fact, Parking Patrols would much rather you park smart and don't get a ticket at all.

REMEMBER:
Park smart and be courteous!

LOT TALK

When parking in lots and parkades, keep these tips in mind.

- Read the signs!
- Rules vary between lots, so to park smart, read the posted signs.
- Many downtown lots are operated by private companies like Impark and Urban Aeropark, and not by the City.
- Reserved... but not for you!
- Reserved signs in parking lots are paid for by monthly parkers or someone paying a premium for that spot.
- Check the times, because some spots are only reserved 6:00am to 6:00pm.
- Look out for day and evening rate changes.
- Many parking lots have flat rates in the evening and one hour or maximum rates during the day.
- Keep it simple and pay by phone at some lots.

NEW AUTOMATED PARKING PAYSTATIONS

The Winnipeg Parking Authority's new solar-powered parking meters create more parking spaces and will save you from parking tickets!

- How do I use the new parking meters?

COINS

1. Insert coins for desired amount of time
2. Press green button to print ticket
3. Place ticket on your dash, face up

CREDIT CARD:

1. Insert and remove credit card
2. Enter desired time OR enter the maximum time
3. Press green button to print ticket
4. Place ticket on your dash, face up

- How do the meters save me from parking tickets
- The new meters won't take payment during no parking times

DOWNTOWN PARKING CHEAT SHEET:
WHAT'LL IT COST YOU?

CITY OF WINNIPEG STREET PARKING METERS
Saturdays: 2 hours free
Sundays: free parking
Monday-Friday, 5:30pm-9am: free parking
Monday-Friday, 9am-5:30pm: $1/hour

DOWNTOWN PARKADES & PARKING LOTS
Hourly: $1-$2.50
Maximum costs vary.
Day: $4-$10
Evening: $1-$6

DOWNTOWN PARKING PLUSES

- Easy on-street parking
- Many indoor and heated parkades
- Indoor walkway system to use once you've parked
- Lots of choice
- Free on-street parking on weekends, holidays and evenings

Save More WITH EASY STREETS

1. Ask for your blue loonie.
   Spend $20 or more (before tax and tip) at participating downtown businesses, and ask for your Easy Streets™ Blue Loonie!
2. Use your blue loonie for:
   - Full fare on Winnipeg Transit buses
   - One hour of parking at City of Winnipeg parking meters
   - $1 off parking at over 80 downtown lots
   - $1 off fare with participating taxis and Handi-Helper Transit
   - $1 off fare on the Splash Dash Water Bus

FOR MORE PARKING INFORMATION:
Winnipeg Parking Authority: 986-6281, www.theparkingstore.winnipeg.ca
FNP Parking: 942-6100, www.thelorks.com
Imperial Parking: 943-3578, www.impark.com
Urban Aeropark: 956-7275, www.urbanaeropark.com
ParkingPlus: 943-8641
Winnipeg Transit: 986-5700, www.winnipegtransit.com
Downtown BIZ: 958-4640, www.downtownwinnipegbiz.com

Trends in Parking & Transportation

Taking a page from our Downtown Management professional's play book, tracking trends and program performance is a good way to keep our customers educated and aware.

ex.

» Trends to track might include:
  - » Community demographics
  - » Changes in land-use
  - » Parking supply & utilization
  - » Parking rates
  - » Community Investment/New Development
  - » Economic data
  - » Program financial performance
  - » Parking services, accomplishments and community reinvestment

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New Technology Introduction –

On-Street Meter Upgrades

Once the decision has been made to upgrade the on-street meter system (or any other parking technology that the public will have direct interface with) it is important to develop a detailed implementation timeline including a public relations strategy.

ex.

- A typical implementation timeline would start early and would be structured with major milestone dates and specific action items.
- A sample implementation timeline is provided to the right:

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On-Street Parking Management Strategies

On-Street Parking - Policy Basics

There are a few basic principles related to on-street parking that most parking consultants, urban planners and downtown management professionals agree on. These include:

- On-street parking is a valuable, limited resource due to its convenience and proximity to businesses, therefore the primary management objective to promote space turnover for the benefit of the local merchants and the public.
- If you are going to have paid parking, charge for the on-street spaces first to promote turnover.
- If you have both on-street and off-street paid parking, the on-street rates should be higher than the off-street.
- Set on-street parking rates to a achieve a 15% vacancy per block face.
- Adopt the philosophy that parking should be " Friendly, not free"

ex.

» The application of parking management "rules and regulations" mandates a need for an enforcement function.

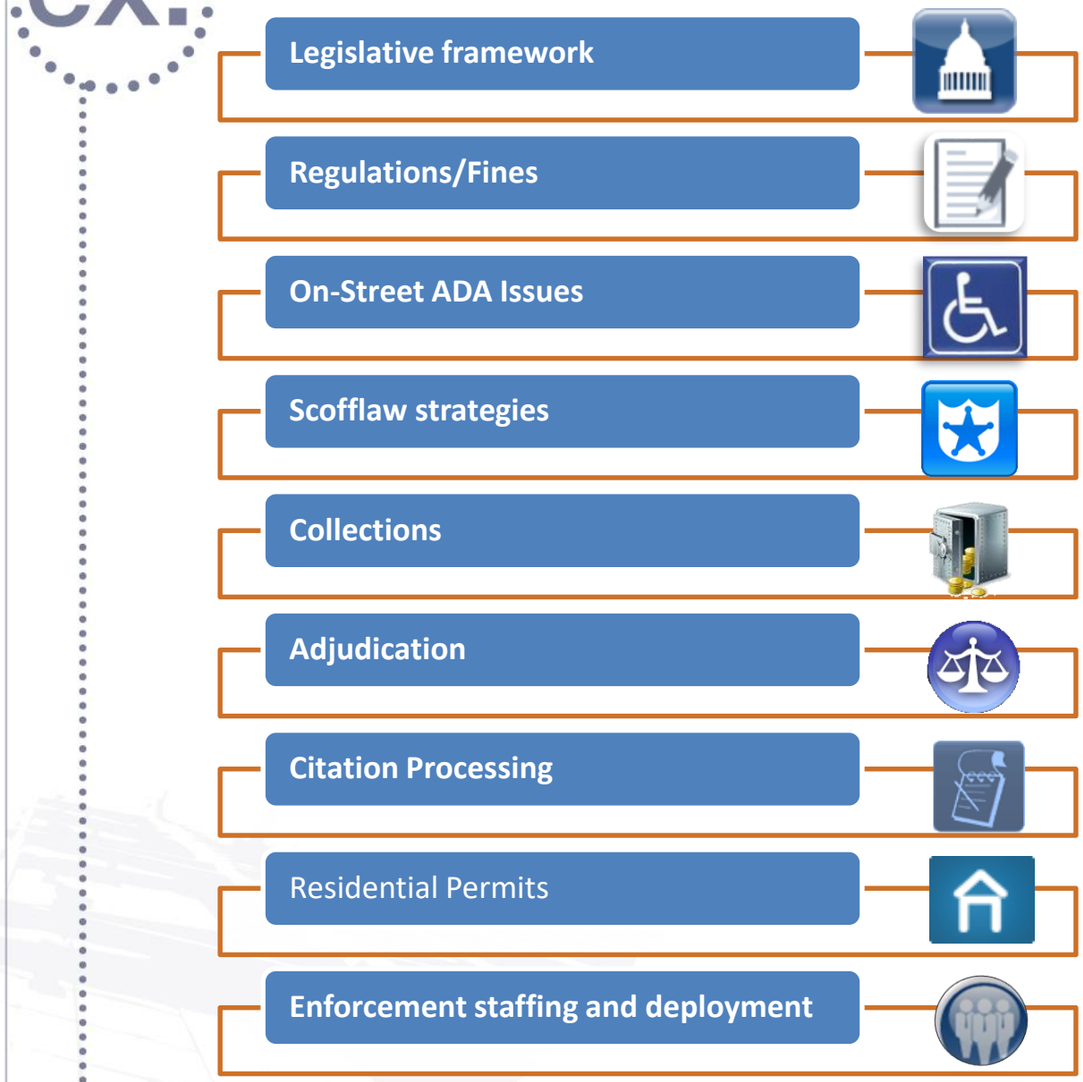
» The primary goals of an enforcement program should be:

- Have a well-defined set of policies and procedures
- Promote general (not absolute) compliance
- Be consistent, but "unpredictable" in enforcement routes and times.
- Leverage new technology to improve efficiency, effectiveness and productivity.

Primary Program Components

The following are a listing of major components of an effective on-street parking program:

- Legislative framework
- Regulations/Fines
- On-Street ADA Issues
- Enforcement staffing and deployment
- Citation Processing
- Adjudication
- Collections
- Scofflaw strategies
- Residential Permits

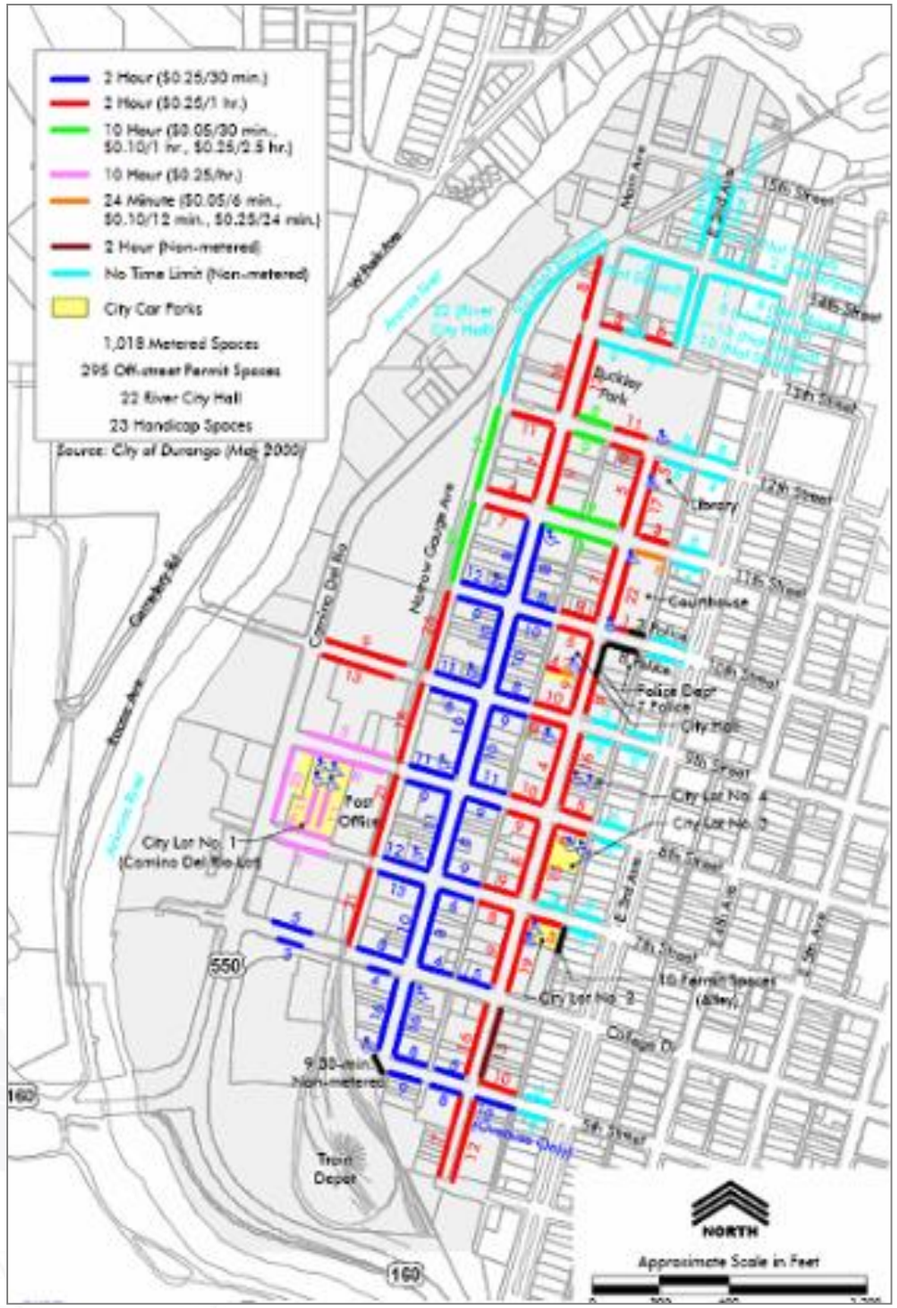


Mapping On-Street Parking Time Limits

On-Street parking time-limits should be mapped and changes tracked over time.

- Mapping on-street time-limits is an important tool for staff education, and communicating with the public.
- It is a fundamental tool for documenting resource usage, facilitates the analysis of trends and is an effective planning tool.
- Tracking changes over time creates a record of management strategies that have been used in the past.

ex.



Monitor and Document On-Street Parking Utilization

Documenting on-street parking occupancy is another effective tool to understanding and managing your parking resources.

- Routinely tracking on-street parking occupancy and documenting the results graphically provides valuable management data.
- Often there is adequate parking supply despite a wide-spread perception that the parking supply is inadequate.
- Documenting the true occupancy rates are the first step to effectively resolving parking problems (real or perceived) and can be an effective community educational tool.

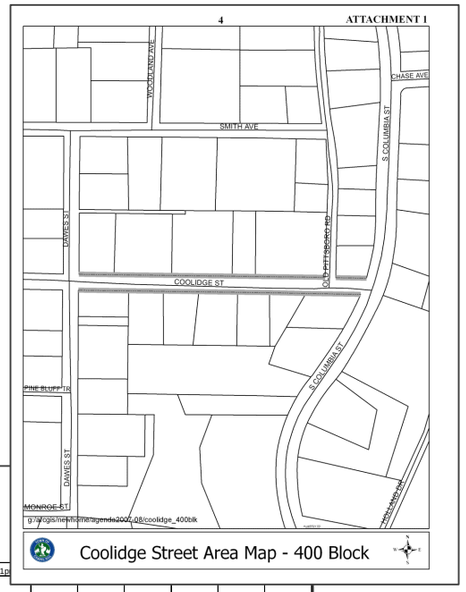
ex.

On-Street Parking Utilization Data Analysis

When designing parking utilization data surveys consider the following:

- What are you really trying to find out?
- Do you need to survey all the spaces or can you use limited area sampling?
  - If sampling, what percent is adequate for statistically valid results?
- How survey many passes are needed?
- How frequently?
- What data do we need to collect?

ex.



City of _____

ON-STREET PARKING TURNOVER

Day and Date

Zone 6

Location	Space #	9am	9:30am	10am	10:30am	11am	11:30am	12pm	12:30pm	1p
5th & Santa Monica-Arizona	1									
5th & Santa Monica-Arizona	2									
5th & Santa Monica-Arizona	3									
5th & Santa Monica-Arizona	4									
5th & Santa Monica-Arizona	5									
5th & Santa Monica-Arizona	6									
5th & Santa Monica-Arizona	7									
5th & Santa Monica-Arizona	8									
5th & Santa Monica-Arizona	9									
5th & Santa Monica-Arizona	10									

City of _____

ON-STREET PARKING OCCUPANCY - SAMPLING

Day and Date

Block #	Spaces	8:00 AM	9:00 AM	10:00 AM	11:00 AM	NOON	1:00 PM	2:00 PM	3:00 PM	4:00 PM
1	6									
2	23									
3	12									
4	9									
5	27									
6	24									
7	65									
8	34									
9	2									
10	31									
11	25									
12	34									
13	56									
14	34									
15	38									
16	44									
17	41									
18	26									
19	23									
20	25									

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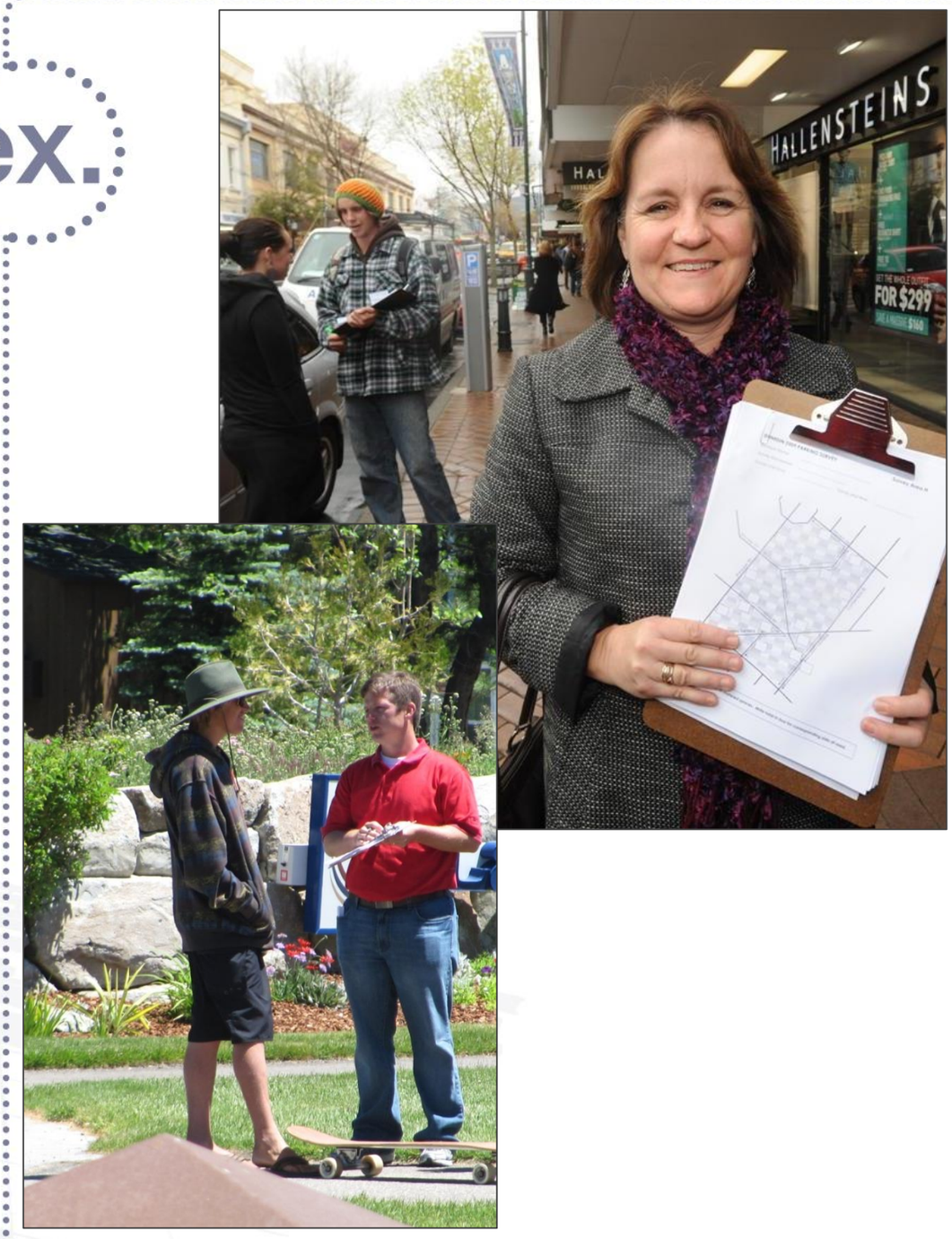
On-Street Parking Utilization Data Analysis

On-Street Parking Surveys: What data can a parking space yield? (First Pass)

- » Regulation in effect
- » Occupied? (Y/N)
- » Vehicle category
- » Legal status
- » If illegal, ticketed? (Y/N)
- » Residency of occupant (requires full plate - optional)

ex.



On-Street Parking Utilization Data Analysis

What data can a parking space yield? (2nd, 3rd, 4th Pass)

- » Occupied? (Y/N)
- » Occupied by same vehicle?
- » Legal status (including overtime)
- » If illegal, ticketed? (Y/N)
- » Duration of occupancy

ex.

The High Cost of Employee Parking in Short-term Spaces

The following is one approach to quantifying the financial impact of employees taking up on-street spaces.

ex.

Fort Collins, CO Case Study

- There are approximately 8,400 employees in downtown Fort Collins.
- If only 5% of those workers use customer parking spaces, 420 spaces would be unavailable to shoppers.
- If each space turned over four times per day, they would accommodate 1,680 shopper trips.
- If each car carried 1.5 customers, there would be 2,520 customers.
- If a quarter those customers went elsewhere to shop and each customer spent $10.00, the total loss per day would be $6,300.

» Annualized at six shopping days each week, the total loss would amount to nearly $2 million in Downtown revenue.

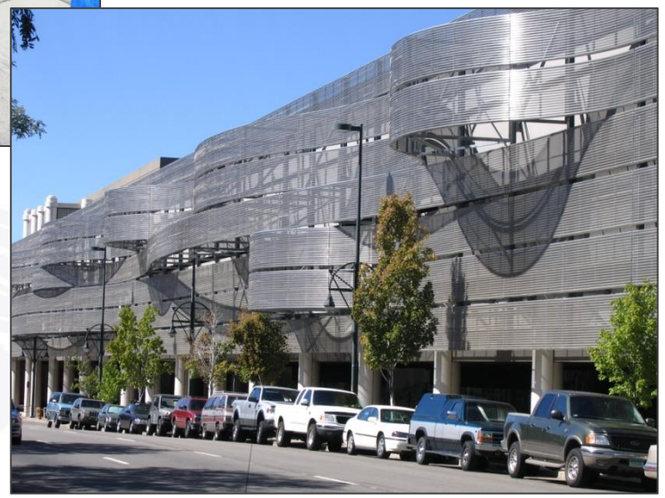
» Obviously this impacts the merchants, but it also impacts the municipality in terms of lost sales tax revenues.

Determining Appropriate Regulations

The following are factors to consider in developing on-street parking regulations and policies:

- Area density
- Area parking mix
- Transportation environment
- Adjacent land uses
- Types of businesses
- Is there a need for:
  - Meters (and what time restrictions and cost)
  - Loading zones
  - Valet zones
  - Permit parking in nearby residential areas

ex.



On-Street Parking Utilization Data Analysis

When analyzing parking utilization data the following are the key metrics to evaluate:

- Occupancy Rate
- Turnover Rate
- Average Duration
- Violation rate
- Capture rate (% ticketed)
- Average time to ticket/unticketed
- Disabled Placard usage
- Impact of non-residents

ex.

Standard Turnover Rate Analysis Output

Parking Space Type	Average Turnover	Average Duration	Number of Time Violations
30-Minute	6.39	43 Mins.	35
1-Hour	5.71	1 hr. 8 Mins.	63
2-Hour	4.17	1 hr. 10 Mins.	59
Disabled	2.00	1 hr. 7 Mins.	NA
Unlimited	3.23	1 hr. 52 Mins.	NA

On-Street Parking Utilization Data Analysis

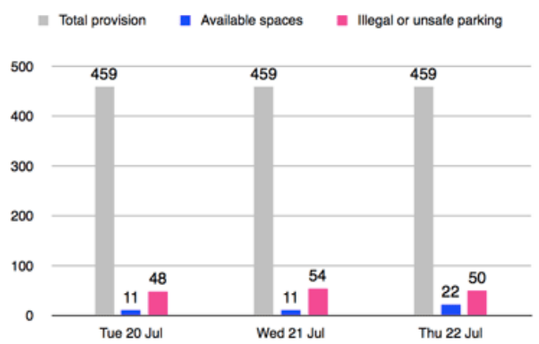
Central Business District - Acceptable Survey Metric Result Ranges

- » Unpaid Legal Meter Occupancy Up to 15%
- » Meter Violations Capture Rate – 33% overall and up to 40% in core areas
- » Duration, or average length of Stay – 67% to 140% of the regulated duration

ex.

Community Parking Survey

Residents in the area have conducted a community parking survey to challenge what is being claimed by the developer. Our own calculations indicate that the transport requirements of the proposed development cannot be met by existing availability in the area.



The parking situation at 10pm on weeknights in July

Existing demand for on-street parking at peak periods, especially in the late evenings and overnight, already leads many drivers to park in unsafe or unsuitable positions such as blocking pavements or on junctions or yellow lines. This factor, which was not taken into account in the survey provided by the developer, illustrates the lack of suitable parking space.

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On-Street Parking Utilization Data Analysis

Central Business District - Acceptable Survey Metric Result Ranges

- Total Meter Occupancy –
  - Ideal = 85% average per block face
  - Upper limit: not above 93% to 95%
- Illegal Meter Occupancy – 5- 7%
- Paid Meter Occupancy – 60-85%

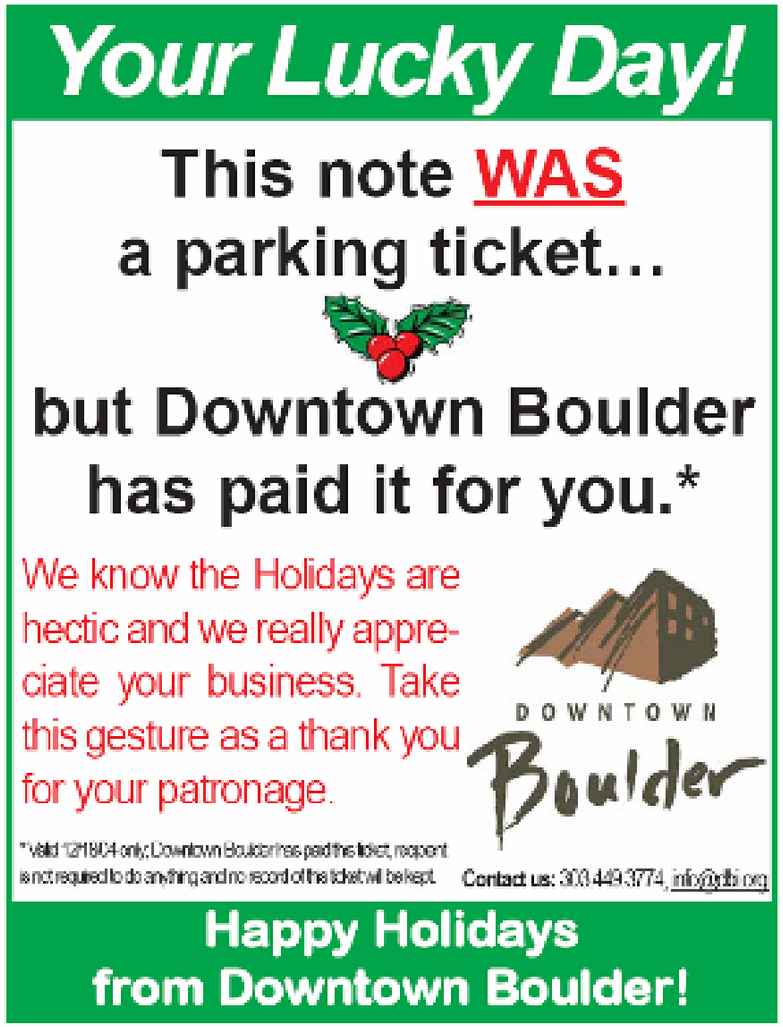
ex.

On-Street Parking Holiday Shopping Program

Holiday parking ticket amnesties and other forgiveness programs are tools to balance the need for parking enforcement with business encouragement through customer appreciation.

- The Downtown Association paid over $6,000 in customer's parking tickets over the Christmas holidays in Boulder last year.
- In other communities, the parking system simply suspends parking enforcement or replaces citations with holiday notices.

ex.



Wireless Hand-held Citation Issuance

The next generation of hand-held devices has allowed parking field personnel to have access real-time information.

ex.

- Examples include: Real-time scofflaw data for enforcement officers – If a vehicle owner has five outstanding citations and the sixth citation should generate vehicle “booting” - the officer in the field needs to know that this is the sixth citation.
- Roving maintenance staff can now be notified in the field via text message of “low tickets”, “ticket jams”, etc. before traffic backs up.

Wireless Hand-held Citation Issuance

The next generation of hand-held devices has allowed parking field personnel to have access real-time information.

- Examples include: Real-time scofflaw data for enforcement officers –

ex.

On-Street Parking Enforcement Program Components

- Legislative framework
- Regulations/Fines
- On-Street ADA Issues
- Enforcement staffing and deployment
- Citation Processing
- Adjudication
- Collections
- Scofflaw strategies

On-Street Parking – Demand-Based Pricing

Best-in-Class parking programs strive to understand the dynamics of parking utilization within a district, neighborhood or even on a block face level.

They invest the time and energy to generate reliable data on which to base policy decisions. This "data-driven" approach benefits everyone from politicians/policy makers to parking management staff and ultimately to customers and residents.

- The goals are to effectively manage a valuable and limited resource to achieve pre-defined goals.
- With more data available than ever before, parking professionals are in a better position to apply basic economic principles (supply/demand) to achieve targeted results.
- This "demand-based pricing" is being used to create better parking availability and reduce congestion during peak demand periods.

ex.

» New wireless technologies hold great promise in making these approaches to even effective and responsive.

» Linking on-street rates to off-street rates and options is the next critical step.

Real Time On-Street Management Information

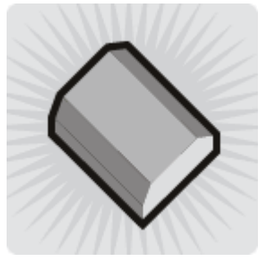
San Francisco is implementing a federally funded pilot program of new on-street parking management technologies and approaches.

Benefits include:

- Find parking faster
- Pay more easily
- Avoid tickets
- Less circling and fewer double-parked cars give us cleaner air and safer streets for bicyclists and pedestrians
- With less traffic, public transit and emergency vehicles move more easily

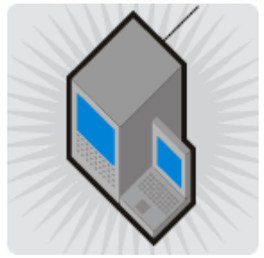
Program Components

ex.



The Sensors

The Meters



Data Feed

Demand Responsive Pricing

SFpark- Overview:

- Using sensors, new meters, and real-time parking data to take the guesswork out of parking in the City.
- Makes parking easier to find and more convenient.
- Benefits will accrue to drivers, Muni riders, bicyclists, pedestrians, visitors, merchants and more.

Pay-By-Cell Phone

No coins to feed the meter? Your time is expiring, but your 3 blocks away? No problem – Pay with your cell phone!

ex.

» How Pay-By Cell Phone Works:

- Once an account is set up, a motorist finds a spot, parks the car, calls a toll-free number and keys in the spot's number.
- If a person is running late, he can remotely buy more parking time with another phone call (assuming it does not exceed the time limit).
- The bill is typically sent to a credit card.
- Customers receive a text message on their phones, warning them five minutes before their time is about to expire.

In-Car Meters

In-Car Meters can be programming for up to twenty time zones with different rates for each zone. They can be used with other systems or as a new “stand alone” system. Controlled parking areas can be increased by adding in-car meters only in fringe areas with no capital investment.

A new version adds time wirelessly via cell phone purchases.

ex.

» User Benefits –

- Convenience
- No need to carry coins or tokens
- System is fair - charging only for the actual time parked
- Motorists receives receipt whenever parking time is purchased
- Replaceable Battery

Meter Time Limit Stickers

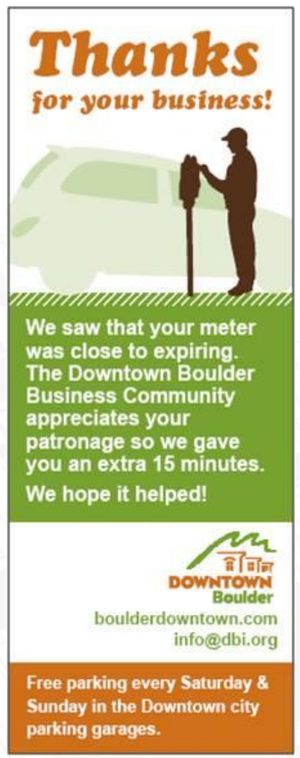
If you still have traditional parking meters, the simple addition of meter time limit stickers can greatly improve the user friendliness of your on-street system, especially for the occasional user.

- Some systems use colored meter polls to indicate time limits, however, this assumes the customers are familiar with the color-coding system.
- The meter time limit stickers are more easily understood by first time visitors.

ex.

Public Relations – "Meter Angels"

Sometimes called the "Meter Angels" program, the Business Improvement District in Boulder will add 15 minutes of time to customer's meters and leave the note below on the vehicle's windshield.



ex.

- On one hand local businesses directly benefit from the parking space turn-over that an effective enforcement program helps provide.
- On the other hand no one likes to receive a parking ticket.
- This program aims at taking the edge off by providing a cushion for those who may be running just a little late.
- Even it the patron still receives a ticket, the effort by the BID is still appreciated.

Creating a Friendly "On-Street Personality"

If we think beyond the job of monitoring on-street parking and issuing citations to vehicles that are in violation of the rules, what else comes to mind?

- Many communities, in an attempt to create an enhanced sense of place and to make downtown a more desirable destination, are transforming "parking enforcement officers" into "Downtown Ambassadors".

- This expanded (and more positive role) can be very successful when a focus on creating a friendlier "On-Street Personality" is prioritized.
- This goes beyond the attitude of the ambassadors; it includes streetscape design, retail enhancements, pedestrian amenities, etc.

ex.

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Effective Parking Enforcement Strategies

Enforcement Technology

The use of advanced parking enforcement technology can have a dramatic impact on the effectiveness and efficiency of your parking enforcement program.

ex.

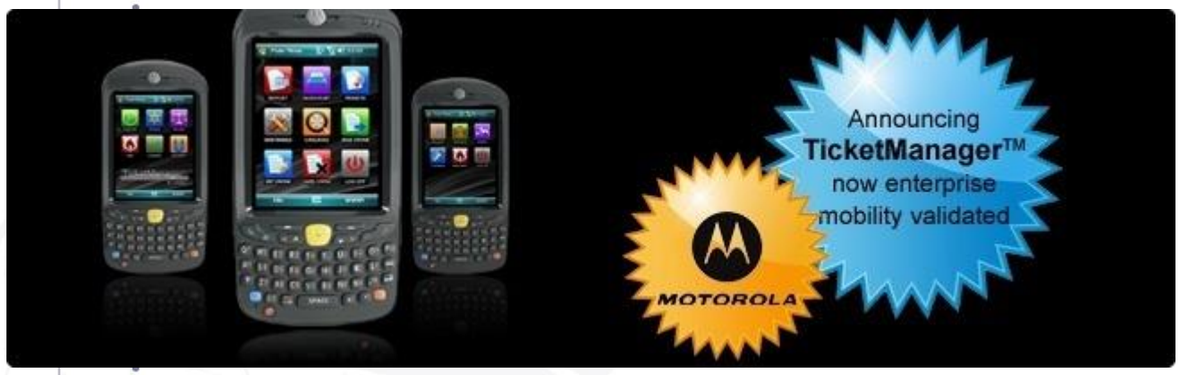
- The use of License Plate Recognition (LPR) systems to automate the enforcement of time-limited areas through the use of efficient “electronic chalking” improves the accuracy and efficiency of enforcement efforts.
- These systems utilize GPS locators and generate real-time scofflaw lists.

On-Line, Real-time Citation Management Systems

The use of advanced parking enforcement citation management systems provide on-line, real-time information to parking enforcement officers on the street.

ex.

- This is critical to effective program implementation.
- It tells the officers which vehicles have previous citations and the status of their accounts.
- If the vehicle is “boot or tow eligible” due to its “scofflaw status”, the officer will know it in real time and be able to take the appropriate action based on departmental policy.



Fine Structures

Parking fine structures should be developed to address the specific problems you are trying solve.

- In the example to the right, the fine structure was modified to be more forgiving to infrequent violators (typically visitors) and more punitive on repeat offenders (typically employees parking in short-term spaces.
- In addition, incentives are built into the fine structure to promote prompt payment and thereby improve the “citation collection ratio”, a key program effectiveness benchmark.

ex.

Overtime violation within 12-month period	Current Amount	Proposed Amount	After 8 days fine increases to:
1st overtime	$10	Warning	N/A
2nd overtime	$20	$10	$20
3rd overtime	$40	$25	$50
4th overtime	N/A	$50	$75
5th overtime	N/A	$75	$100
6th or more…	N/A	$100	$150

On-Line Citation Payment Options

Allowing the payment of non-contested parking citations on-line improves customer service, increases your citation collection ratio (and therefore revenue) and improves collections processing efficiency.

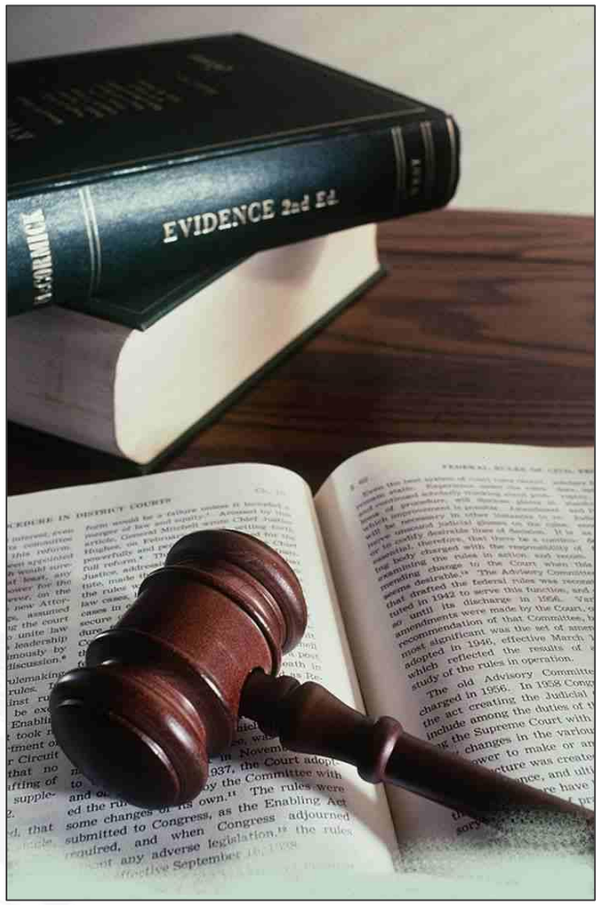
ex.

- Helps meet goals of providing timely, customer oriented services.
- Accepts multiple payment options including credit cards.
- Simple, straightforward processing.

Separation of Duties in Parking Citation Adjudication

Just as the concept of “separation of duties” is a key auditing principle when evaluating program financial accounting, the same concept applies to parking citation adjudication (appeals processes).

ex. » The agency/department that issues parking citations should not be the same entity that reviews and processes contested citations.



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Effective Facility Maintenance Practices

Hinged Light Poles

Many times parking systems know they have a few lights out, but it is expensive to bring in a bucket truck to change just one light, so they live with the liability until we have more than one light to replace better justifying the expense.

ex.

- Hinged light poles make it possible for two men to change out light bulbs without the expense of a bucket truck.
- This approach reduces liability, improves safety and reduces cost.

Striping Removal

Occasionally, due to operational changes, old parking stripes need to be removed. After trying several removal strategies the use of a 3M product called “Peel Away” proved most effective.

ex.

- Removal of the existing paint was initially attempted using high pressure water treatment alone.
- Chemical removal of the existing striping with MEK (Methyl Ethyl Ketone) proved ineffective and raised environmental/disposal concerns.
- Another option attempted was to try and paint over the stripes attempting to match the color of the concrete.

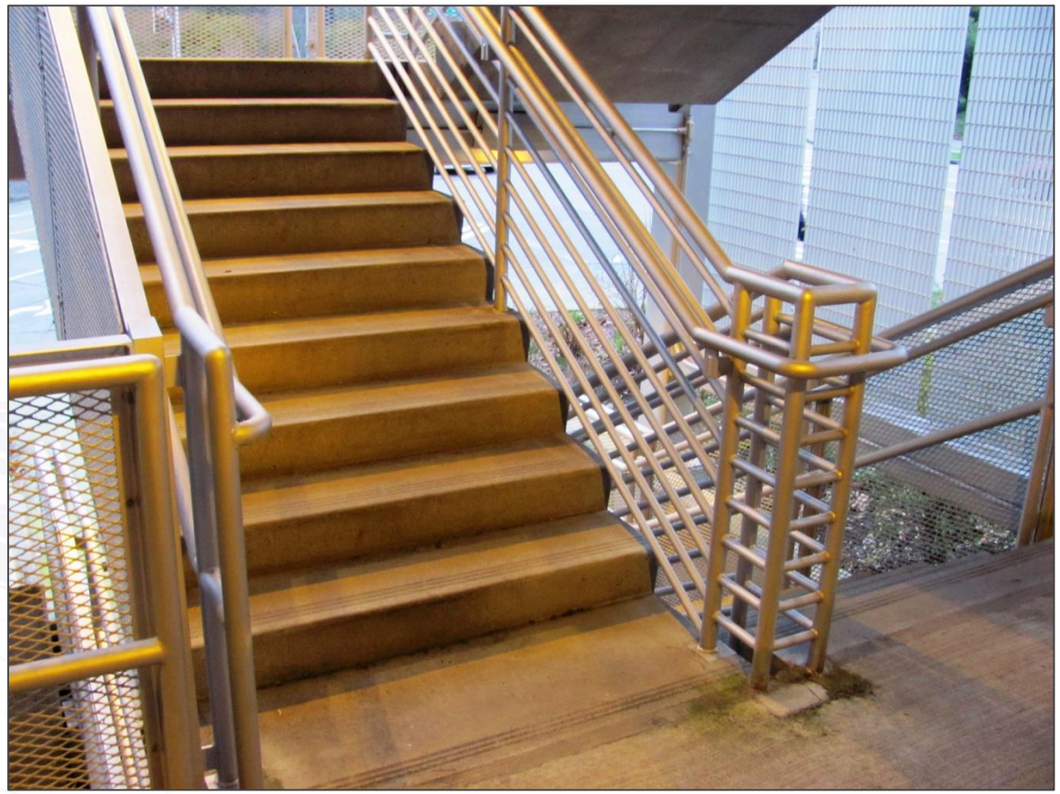
Invest in Maintenance Free Infrastructure

Traditional metal stair railings an other metal parking garage elements eventually rust and need to be painted.

An initial investment in stainless steel or galvanized metal elements can pay big dividends in the long run on maintenance savings and a better looking facility.

ex.

» Elimination of this type of maintenance headache is estimated to save a minimum of 80 maintenance man-hours per year per garage.



Bird Management

Avipel is a nuisance bird repellent.

The cost of Avipel is less expensive than other mechanical options. It also is easier to apply and more economical to the end user.

Endorsed by PITA and the American Human Society

ex.

» The material is applied to surfaces where birds land. The birds will then walk, stand, or roost on the material. As the bird preens it is inevitable that the bird will ingest the anthraquinone (referred to as AQ). This will cause a short-lived gut reaction that lasts for a short time. The bird will then realize that the AQ is noticeable through the UV light spectrum and associate the ill feeling with the UV sight and refrain from going to that area.

AVIPEL™

Environmental Responsibility

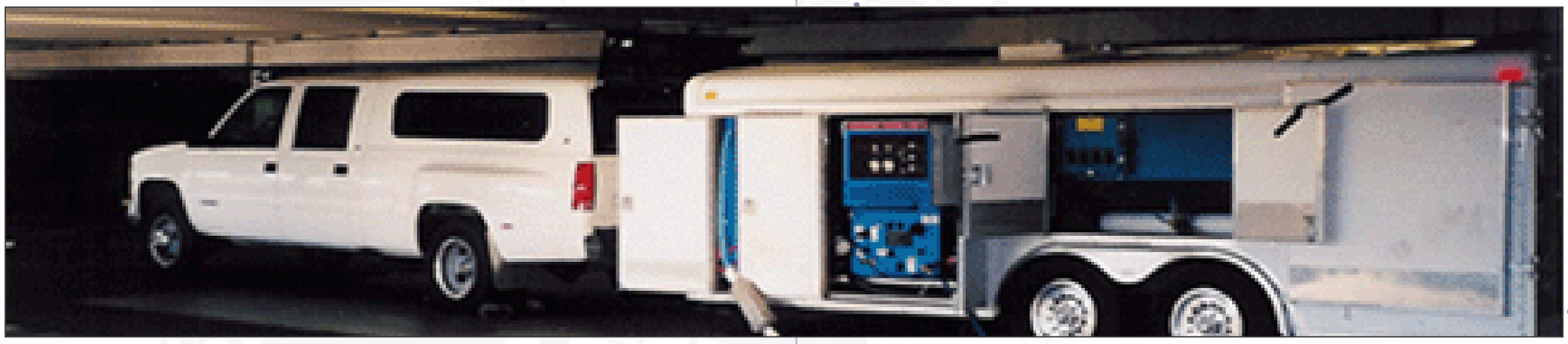
Mobile Parking Garage Cleaning Systems are designed for specific types of pressure washing or water jetting activities, designed to provide an affordable, safe method for quick, simple on-site treatment of the wastewater generated to remove contaminants, such as oil, grease, hydraulic fluids, trace metals, PCBs or paints.

ex.

» The basic components of these mobile systems include a pressure washer or water jetting equipment

- Heater (optional)
- Vacuum/Recovery System
- Waste Water Processor

Budget:
$0.05 – $0.12 per square ft.



Fluorescent Lamp Recycling

Spent Fluorescent Lamps Must be Properly Handled and Stored to Limit Mercury Exposure.

ex.

- Energy efficient fluorescent lamps can contribute to a cleaner environment, but they must be managed properly. For most us, fluorescent lamps present the single greatest risk of mercury exposure in the work place. Protect the health and safety of your employees and customers
  - Reduce the soft costs of managing mercury waste
  - Reduce your company's risk and liability
  - Improve your regulatory compliance

Kimley»Horn

Ch.
14

Facility and Equipment Protection Systems

Automated Pay Station Shelters

With the recent rapid growth of automated pay stations, shelter providers have begun developing special products to protect your investment and minimize repair expenses.

ex.

- These shelters are designed to increase equipment longevity by protecting them from rain and snow.
- Features include:
  - Translucent fiberglass roof
  - Tempered safety glass
  - Aluminum kick panels
  - Elevated wall panels to facilitate ventilation and drainage
  - Options to accommodate graphics and signage.

Collision Avoidance Alarms

Collision avoidance alarm systems help prevent costly repairs and injuries caused by collisions between oversized vehicles in parking garages and other facilities.

ex.

- When installed in front of (and slightly below) roll up doors and overhead objects, any contact with the Watchman triggers a 120db siren and flashing red lights, warning forklift drivers and warehouse management before a collision occurs.
- In addition to overhead doors, the Watchman can be used to protect conveyor systems, canopies, walls, pipes, sprinklers, ducts and other overhead fixtures.
- The patented* Watchman can be purchased for a fraction of the average repair bill for a damaged overhead door, making it practical to equip your entire facility with this unique safety device.
- www.alvarado.com

Column & Vehicle Protection Systems

Products such as “Park Sentry” provide flexible and cost effective options to protect customer vehicles and concrete columns in parking structures.

ex.

- Protect square or rectangular concrete columns in parking garages without adding bulk to the column.
- Park Sentry creates a safe zone around the column, protecting both the column and vehicles from collision damage.
- It is scratch, abrasion and collision-resistant, and can be installed quickly without tools for immediate protection.
- www.sentrypro.com

Flex Posts

Flex post signs spring back to their original position after being hit. No sign, pavement or vehicle damage. No replacement required.

- Signs get hit.
- They bend. They break. They require replacement.
- They cost more than their purchase price.
- Their appearance impacts your professional image.

ex.

www.flexpost.net

Height Clearance

Parking structures have limited height restrictions. "Headache Bars" are the traditional solution. New electronic sensor systems detect over-height vehicles and activate flashing electronic signs to more effectively alert drivers.

» Electronic height detectors utilize an "electric eye" at a predefined height. If the sensor is tripped by an oversized vehicle a flashing over-height warning sign is activated.

ex.

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Ch.
15

Valet Parking Best Practices

Centralized Downtown Valet Parking Programs

Park your car at any location, pick it up at any number of other locations. This best practice encourages downtown patrons to walk, shop and explore.

Successful programs have several elements in common:

- A consolidated, single-operator parking management agreement.
- The operator is selected via a competitive process.
- A detailed management agreement specifies City approved terms and service criteria.
- Supported by a well-defined Valet Parking Ordinance.
- Has well-defined valet station and signage standards.
- Leverages state-of-the-art valet management technology

ex.

Centralized Downtown Valet Parking Programs

CASE STUDY:

Coral Gables, FL

Miracle Mile Shopping District

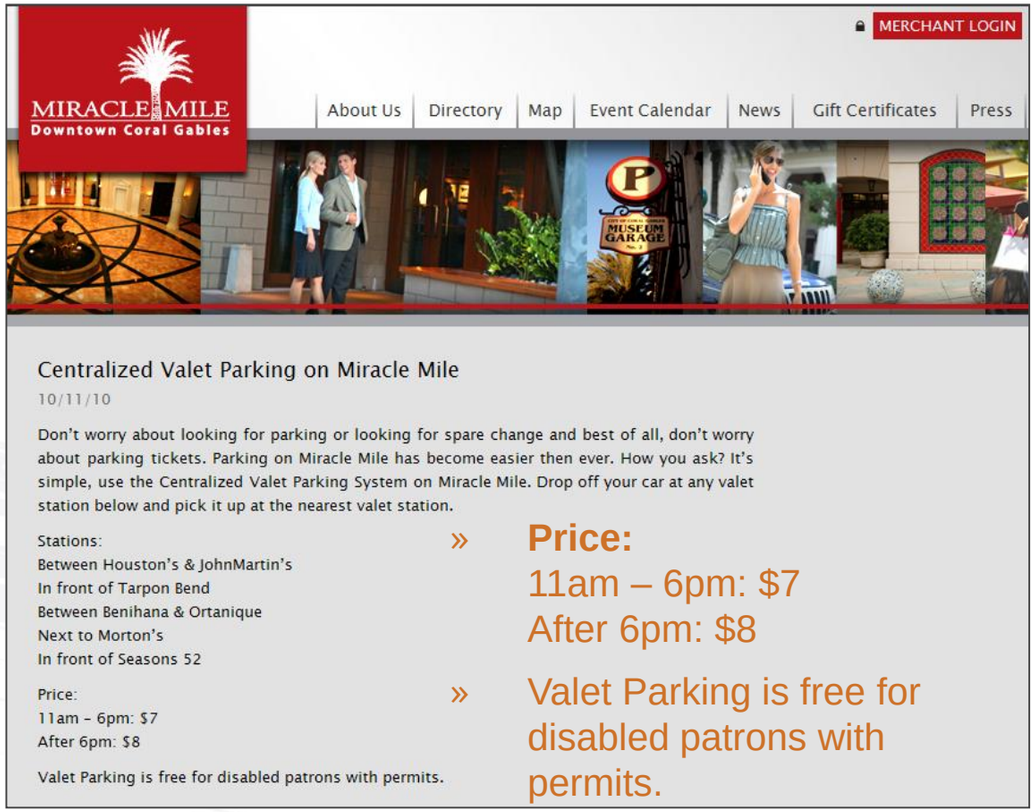
Webpage Introduction:

» Don't worry about looking for parking or looking for spare change and best of all, don't worry about parking tickets.

» Parking on Miracle Mile has become easier then ever. How you ask? It's simple, use the Centralized Valet Parking System on Miracle Mile. Drop off your car at any valet station below and pick it up at the nearest valet station.

ex.

» Valet Stations:
  - » Between Houston's & JohnMartin's
  - » In front of Tarpon Bend
  - » Between Benihana & Ortanique
  - » Next to Morton's
  - » In front of Seasons 52



» **Price:**
11am – 6pm: $7
After 6pm: $8

» Valet Parking is free for disabled patrons with permits.

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Valet Express Program

Call ahead service for Valet operations to reduce waiting times for vehicle retrieval.

» Preprinted cards handed out upon arrival with local phone number to call 10-minutes prior to departure.

ex.

AMERICAN VALET

Valet Express

480-947-2582

EXPRESS HOTLINE

Please call our Valet Express hotline no more than 5 minutes before you are ready to leave. Your vehicle will be waiting for you when you reach the valet desk.

Valet Express

Advanced Valet Parking Management Practices

Self-serve Request Kiosks

The most popular casino valet systems are equipped with **high definition digital camera lane technology**, VIP Request kiosks, valet management software and even a mobile PC interface to keep management informed – real time!

- Self-serve Request Kiosks allow departing customer to initiate their vehicle retrieval simply by scanning their bar coded valet parking ticket at the built-in reader.
- Customers may wait inside a climate controlled space in view of the staging area until their vehicle is retrieved

ex.

- A dial-up request module allows visitors to request vehicles by cell phone or text message.

Advanced Valet Parking Management Practices

HDIP Digital Camera Interface

One of the more popular system modules is the HDIP Digital Camera Interface. It provides the comfort of knowing whether or not an alleged damage liability was incurred while the vehicle was in your care.

» No more guess work, irate customers and time consuming case building. Here, a picture is worth a thousand words.

ex.

Advanced Valet Parking Management Practices

HDIP Digital Camera Interface

Wireless Mobile Technology has become another popular tool and can be very effective in the right application.

ex.

» Hardware options range from a compact blue-tooth wireless scanner designed primarily to ‘time-stamp’ newly issued tickets in the lane, to full featured mobile PPT’s with built-in license plate recognition.

Advanced Valet Parking Management Practices

Valet Parking Management iPhone App

The new **iValetParc.net** could be a game-changer. It is a powerful, visually appealing and user-friendly valet parking management application.

ex.

» In addition to its wireless mobility, it also features an intelligent data management solution called ICDataFlow™ and revolutionary new VisualValet™ concept (patent pending).

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Ch.
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Parking Facility Safety & Security

Passive Security Design Features

Investing in “passive security” features pays dividends in the long run.

ex.

- Passive security is defined as any device or technique not requiring a human response, such as lighting, fencing, glass-backed elevators and stairwells, etc.
- Passive security is more cost effective, and if done well, contributes to a patron’s feeling of safety and comfort within a facility.

Parking Safety Escorts

Parking escorts for employees and downtown patrons is a much valued service in many communities.

ex.

- These programs are often done in collaboration with a Business Improvement District, a large downtown employer or with a consortium of downtown restaurants.
- In some cases, off-duty police are engaged to provide this service.

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Secure Parking Deck Stairwells!

Eliminate potential “hiding places”.

Secure areas below stairwells for safety and to create additional secure storage area.

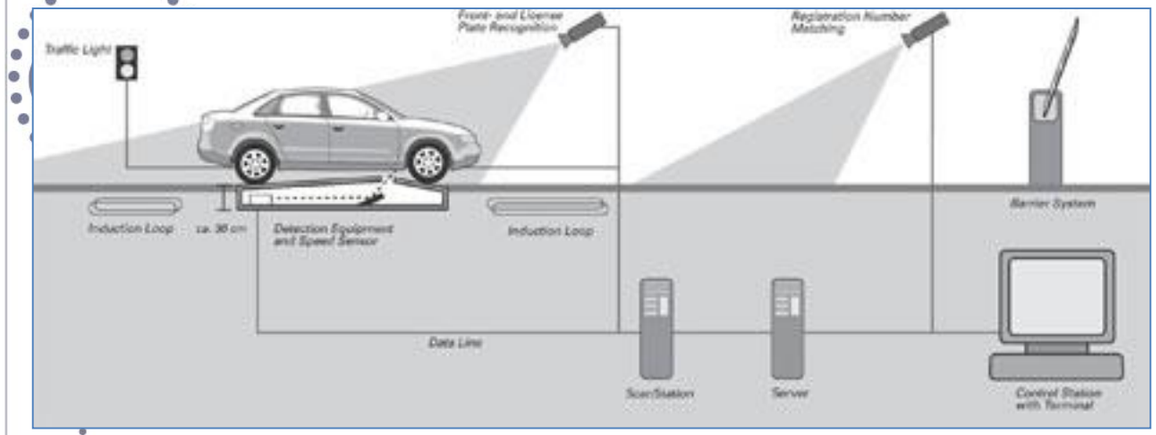
- Wire Mesh Protection Door with automatic closure and lock will limit access to roofs, basements and behind stairwells.
- It eliminates possible hiding areas and improves parking facility security.
- It also creates additional on-site secured storage areas.

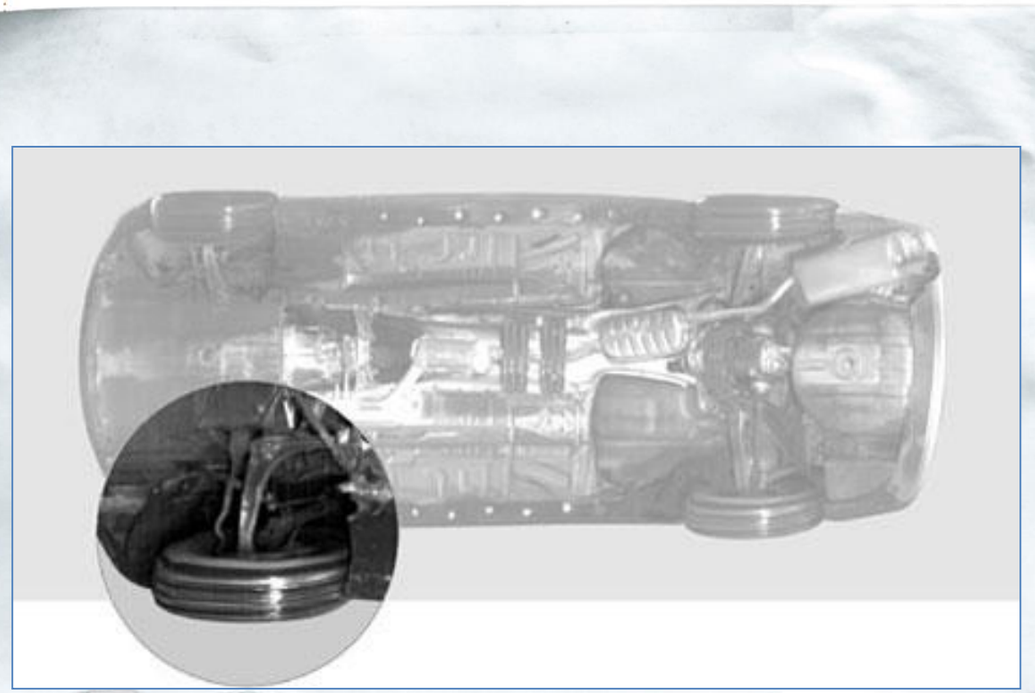
ex.

Under Vehicle Monitoring Systems

In today's ever changing world, Security is on the minds of Industry Professionals.

In response to the security challenges in the parking environment, under vehicle monitoring systems are a new option to consider.





» BENEFITS

- Highly mobile for temporary applications with speeds up to 35 mph
- High resolution imagery with tremendous "zoom" capabilities
- Automated license plate capture with underside vehicle "matching"
- Extensive statistical analysis on collected vehicle data.

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Ch. 17

Risk Reduction and Liability Limitation

Parking Lot Safety Products

1 in 5 accidents occur in parking lots!

» One way to defend against this is to provide devices help to enforce safer driving behavior, ensuring pedestrians and drivers are protected from the dangers often found in these areas.

» By using recycled materials, we can contribute to our program sustainability goals and enhance the longevity of these products.

ex.

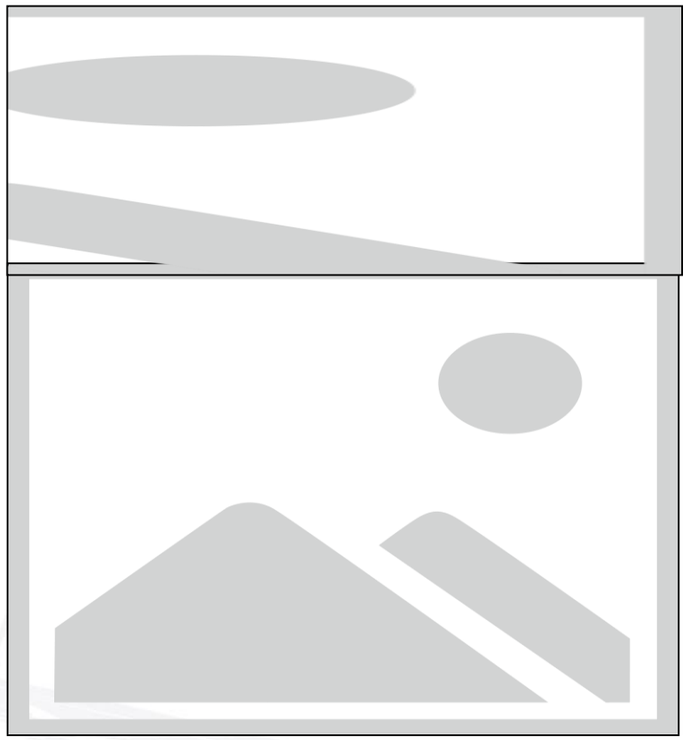
» PARK –IT CAR STOPS

- Year Installed: 1998
- Year Photo Was Taken: August 2008
- Installation Location: Owensboro, KY
  - This is a photo of the Park-It Car Stops installed at a beauty salon in Owensboro, KY in 1998. Used to help guide vehicles when pulling into a parking stall, this installation was done on asphalt using rebar spikes and is 11 years old!

Smart Gates

"Smart Gate Technology" incorporates non-contact safety sensors for parking barrier gates.

ex.

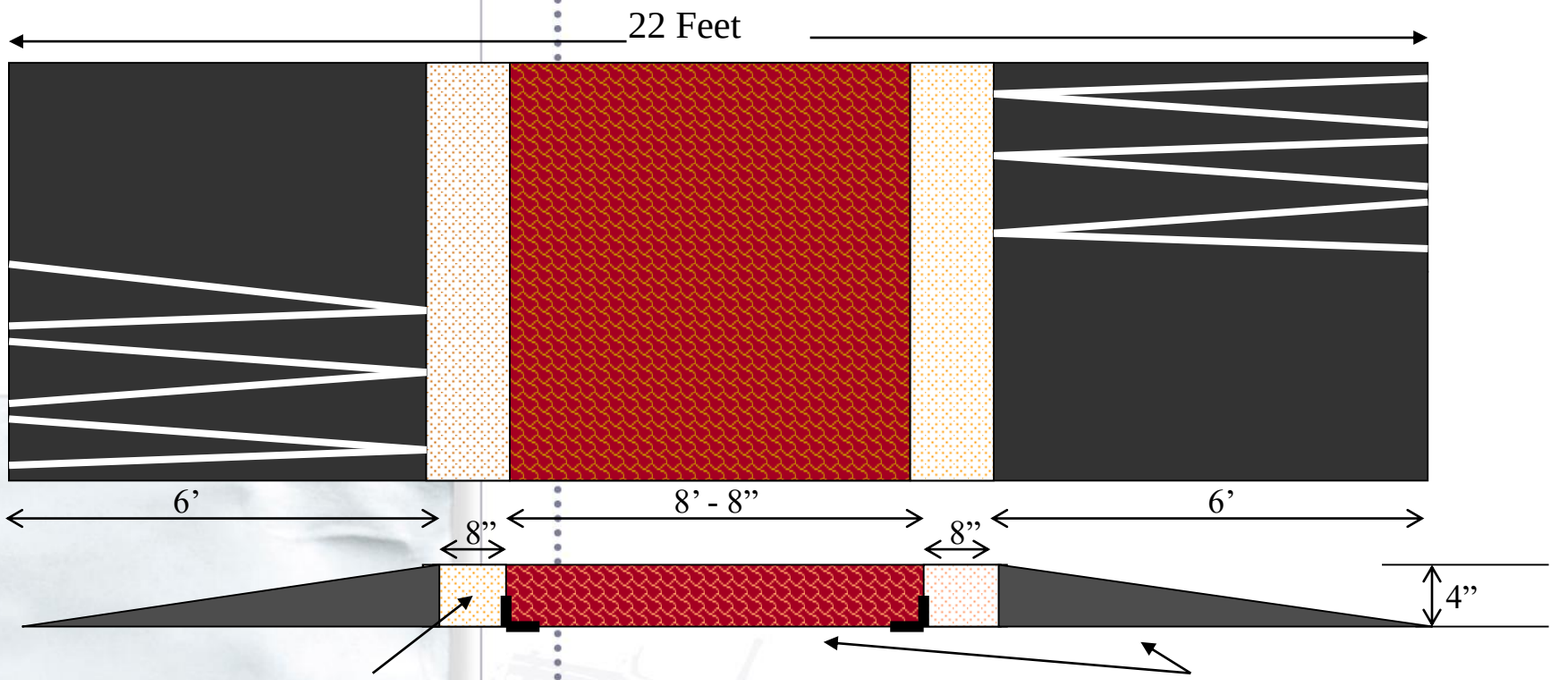


- This technology places protection in front of moving doors or gates by providing a non-contact safety field that moves with and precedes a gate arm or door to sense potential contact before it happens and prevent it.
- This technology can reduce damage claims due to alleged gate malfunctions.

Traffic Calming (Raised Crosswalk/Speedhump)

Raised crosswalks or “speedhumps” can enhance pedestrian safety in pedestrian/vehicular conflict areas.

ex.



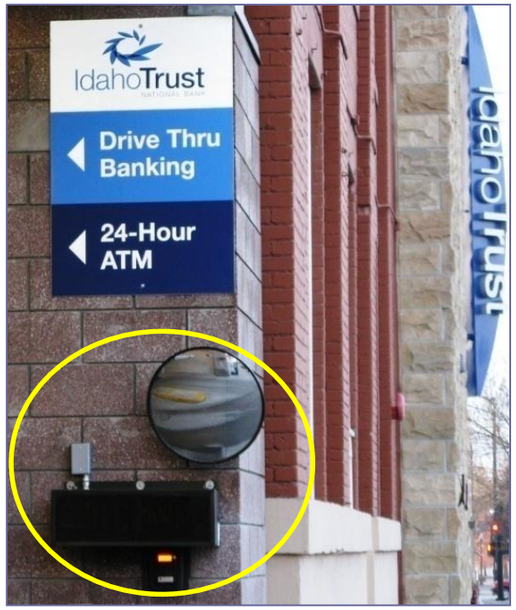
- This traffic calming strategy is primarily used in residential areas.
- One key to a successful “speedhump” is a large enough “table” for a full-size vehicle to fit on to reduce excessive vehicle bouncing.

Pedestrian Safety Options

Flashing Signs with audible signals activated by exit lane loop detectors alert pedestrians on the sidewalks approaching parking garage portals of on-coming vehicular traffic.

» Other pedestrian safety elements include signage and convex mirrors.

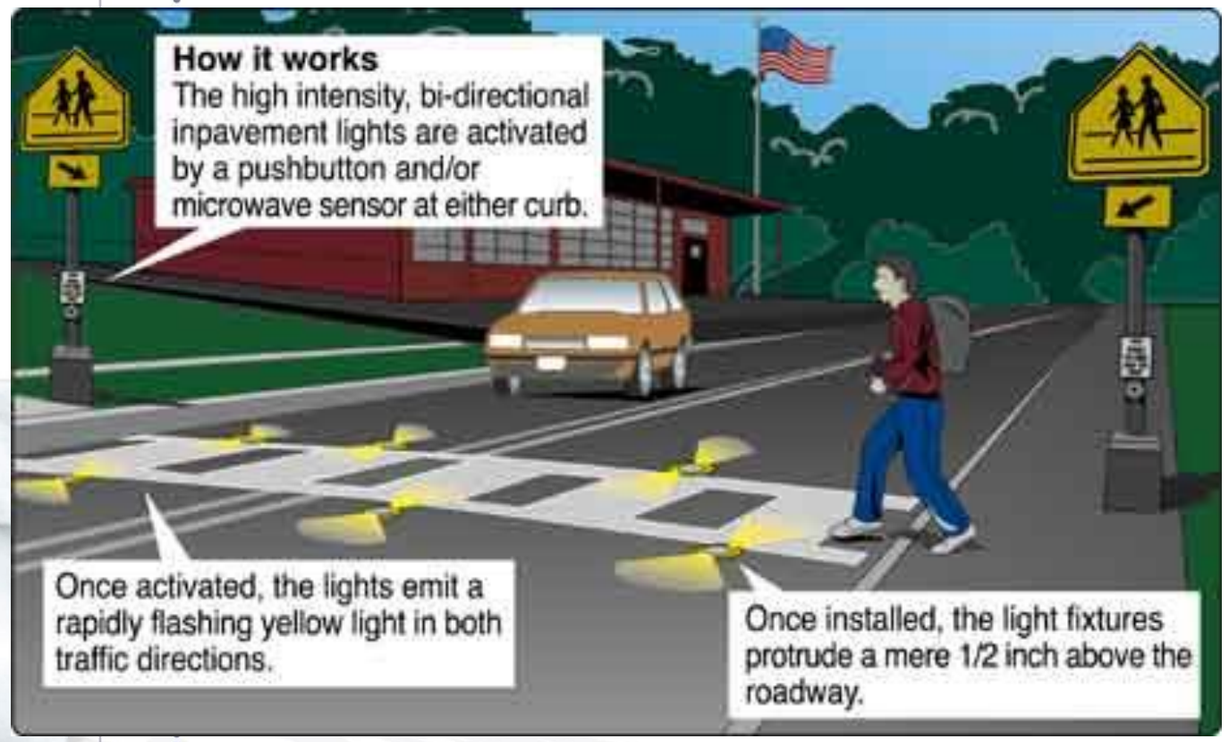
ex.



Pedestrian Safety

Lighted crosswalks activated by push button or microwave sensor enhances pedestrian safety.

ex.



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Illuminated Gate Arms

Designed to provide exceptional visibility, particularly between dusk and dawn.

ex.

» Illuminated gate arms are a new feature, which offers safety advantages especially in areas with high pedestrian activity.

Hi Def Digital Camera Modules

The idea of documenting the physical condition of a vehicle in order to ascertain the origin of damage liability has become a valet industry best practice.

» However, the use of new High Definition IP Digital Camera Modules has taken this standard to the next level.

» In this case, a picture really is worth a thousand words!

ex.

FEATURES & BENEFITS

50% - 80% Claims Reduction

Pre-Existing Damage Assessment

Positive Valet Driver Identification

Missing Key Prevention

Instant Picture Recall

Search By Date/Time/Make/Plate/Name

Complete Case Report Generator

Indefinite Vehicle Data Storage

License Plate Recognition

Vehicle History File

Visual History File

Visual Screen Tools (Move, Capture, Zoom)

High Zoom Capabilities Without Pixelation

Mpeg Vehicle Scan Option

STS service tracking systems.net

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PARKING | The Next Level

PARKING MANAGEMENT & DESIGN - **Best Practices**

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Ch. 18

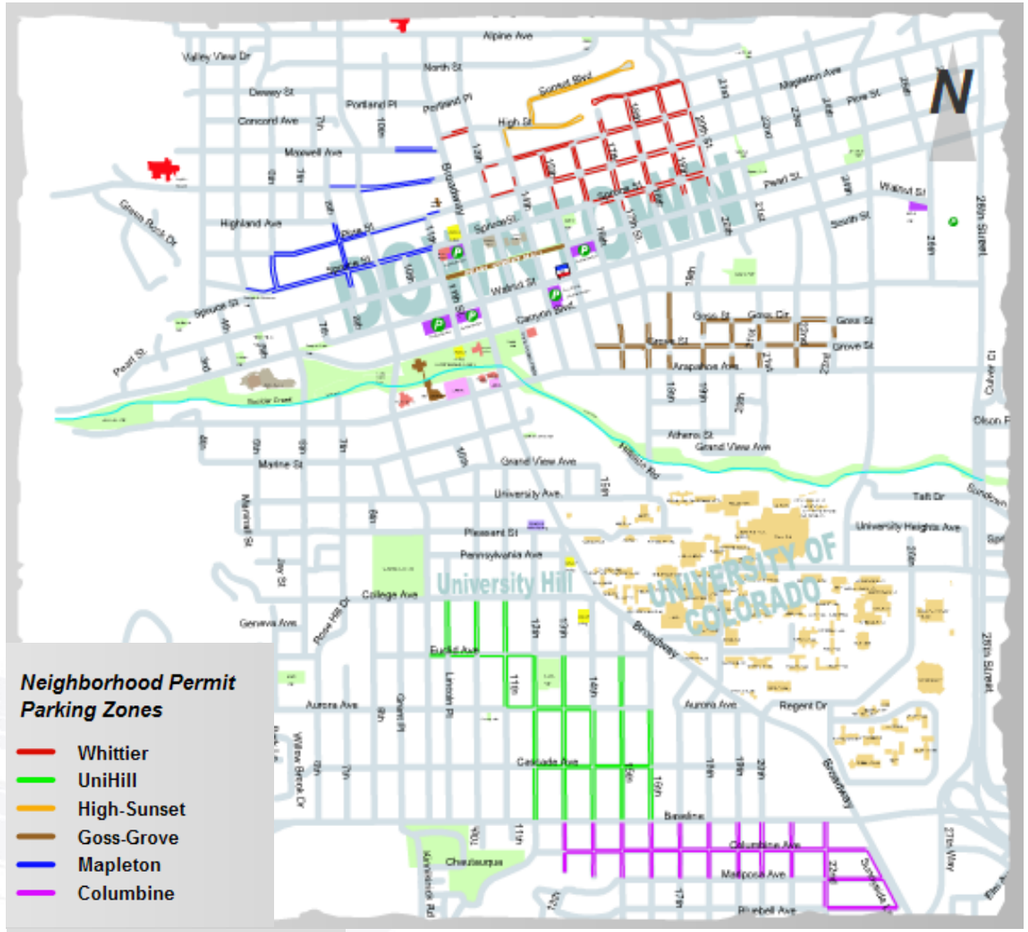
Residential Parking Permit Programs

Neighborhood Parking Permit Programs

A Neighborhood Permit Parking zone is a residential area where on street parking is restricted. NPP programs are developed as a tool to balance the needs of all who park on our streets, including residents, visitors and commuters.

- To be considered for an NPP zone, neighborhood residents assess their parking needs by working with the City to determine the feasibility of a potential parking permit zone.
- After at least 25 neighbors have applied by petition, the City initiates a multi-step process for development and approval of a new zone.

ex.



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Staff Development and Training

Library of Parking Reference Materials

Create a library of parking reference materials for staff training and development.

Recommended Parking Planning and Management Resource Library

The following is a basic bibliography of good parking planning, general management and marketing texts that can increase your staff's knowledge:

Parking Planning

i. Parking 101, A Parking Primer – International Parking Institute Fredericksburg, VA, 2002

ii. Parking 102, Parking Management ~ The Next Level – International Parking Institute Fredericksburg, VA, 2004

iii. Parking 103, Parking Management - Planning, Design & Operations – International Parking Institute Fredericksburg, VA, 2004

iv. Parking - Robert A. Weant and Herbert S. Levinson, Copyright - Eno Foundation for Transportation, Washington, DC, 19

v. Parking Structures, Planning Design, Chrest, Mary S. Smith, Sam Bhuyan, 2001

vi. The Dimensions of Parking - Various National Parking Association, Fourth

vii. Parking Generation – Institute of Tra Washington, DC, 1987

viii. The Parking Handbook for Small Co Institute of Transportation Engineers,

ix. Shared Parking Second Edition – Stu Institute, Mary S. Smith, Washington,

x. Lighting for Parking Facilities – Illumi Publ. No. RP-20-98, 2nd Edition, New

xi. Recommended Guidelines for Parki Parking Association, Publication No.

xii. Implementing Effective Travel Dema of Transportation Engineers, ITE Publ

Kimley-Horn and Associates, Inc.

xiii. Architectural Graphic Standards – American Institute of Architects, ISBN: 0471382876, Wiley, John & Sons, Incorporated, Illustrated, 2000

xiv. The High Cost of Free Parking – Donald Shoup, American Planning Association, Planners Press, Chicago, ISBN: 1-884829-98-8, 2005

General Management

xv. The Portable MBA – Eliza G.C. Collins, Mary Anne Devanna, John Wiley & Sons, New York, NY, 1990, ISBN: 0-471-61997-3

xvi. Good to Great – Jim Collins, Harper Business, New York, NY, ISBN: 0-06-662099-6, 2001

xvii. The Five Dysfunctions of a Team – Patrick Lencioni, Jossey-Bass, San Francisco, ISBN: 0-7879-6075-6, 2002

xviii. QBQ – "The Question Behind the Question" and Flipping the Switch – John G. Miller, The Penguin Group, New York, NY, ISBN: 0-399-15295-4

xix. The 4-Dimensional Manager – Jukie Straw, Berrett-Koehler Publishers, Inc., San Francisco, ISBN: 1-57675-135-X

Downtown Management

xx. Making Business Districts Work – David Feehan, MSW, Marvin D. Feit, PhD, The Haworth Press, Inc., Birmingham, NY, ISBN 0-7890-2390-3

Economic Development

xxi. Economic Development in Local Government – Roger L. Kemp, McFarland and Company Publishers, Jefferson, NC, 1995, ISBN: 0-7864-0095-1

Marketing

xxii. Guerrilla Marketing – Jay Conrad Levinson, Houghton Mifflin, Company, Boston, 1993, ISBN: 0-395-64496-8

xxiii. Waiting for Your Cat to Bark – "Persuading Customers When They Ignore Marketing" – Bryan & Jeffrey Eisenberg, Nelson Business, Nashville, TN, ISBN: 0-7852-1897-1

Kimley-Horn and Associates, Inc.

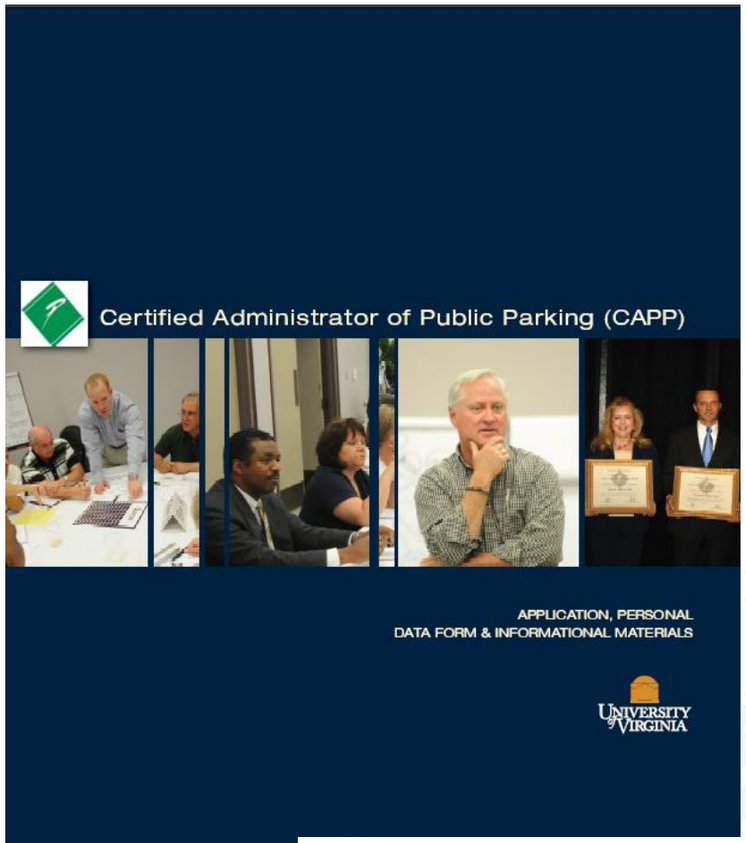
2 | Page

ex.

- Slowly the parking industry is beginning to build up a good selection of text books in a variety of areas.
- Both the IPI and the NPA have some excellent publications on parking design, maintenance and management.
- Other groups such as the Urban Land Institute, the American Planning Association, the Eno Foundation, the International Downtown Association and the Transportation Research Board also have a variety of parking and transportation offerings.

Certified Administrator of Public Parking

The Certified Administrator of Public Parking program offered by the International Parking Institute is the most respected certification program in the parking industry.



"The CAPP Program is an outstanding program that is far superior to any other educational program in the industry."
-Greg Stormberg, CAPP, CPP

ex.

» **Why CAPP Certification?**
Parking and transportation services have become a major element affecting the lives and activities of millions of citizens in the United States, Canada and around the world. As an industry, parking now accounts for billions of dollars and more than a million jobs each year, and as a profession, it is now a serious career choice. As such, it demands continuous information and specialized training.

The International Parking Institute, and the University of Virginia, have combined their resources to create a rigorous program of professional training and examination culminating in the awarding of the designation, Certified Administration of Public Parking (CAPP).

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Parking Access & Revenue Control Systems

Hands Free Access

Automatic Vehicle Identification (AVI) systems provide a more customer friendly system while improving security (no stopping, no rolling down windows and enhances driver safety by keeping their hand on the wheel and eyes on the road.) It also increases vehicle through-put during peak demand periods.

ex.

- Radio signal from reader activates tag
- Transponder reflects data
- Reader processes data and
  a. Opens gate if valid
  b. Sends data to host CPU
- Host processes data, and records transaction

Metered Transient Parking

For situations where there are only a limited number of transient spaces within a facility, controlling/charging for those spaces with meters can be a cost effective alternative to traditional exit cashiering.

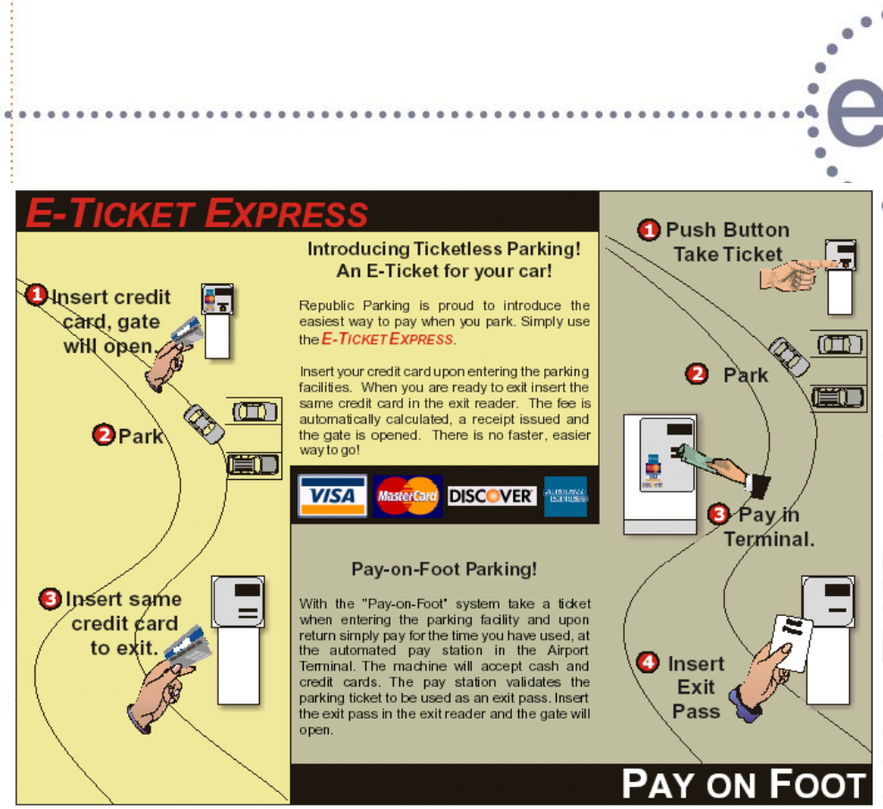
ex.

- In the facility to the right there were just over a hundred transient spaces available, the rest were reserved for monthly parkers. The revenue stream from the transient spaces would not have justified two shifts of exit cashiers, plus supervision, fee computers, booths and other capital items.
- Note that there are still staffing costs with this option as the meters need to be enforced.

Ticketless Parking

Ticketless parking provides several advantages to customers and parking systems – This strategy is also known as Credit Card In/Out. It can work in conjunction with other systems, such as pay-on-foot.

ex.



- This operational model offers customers the benefits of quick in and out and easy payment.
- The operational benefits are that it is attendantless, and therefore lowers operating costs and it is cashless, thereby reducing the potential for theft.
- The reduction in operating costs more than makes up for the minimal credit card fees.

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Ch.
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Parking Accounting and Auditing

Patron Fee Displays

While not new, patron fee displays remain an important customer service and revenue control feature in a cashiered facility.

It is important in locating the fee display that the cashiers cannot conceal the display, a factor that is often overlooked.

ex.

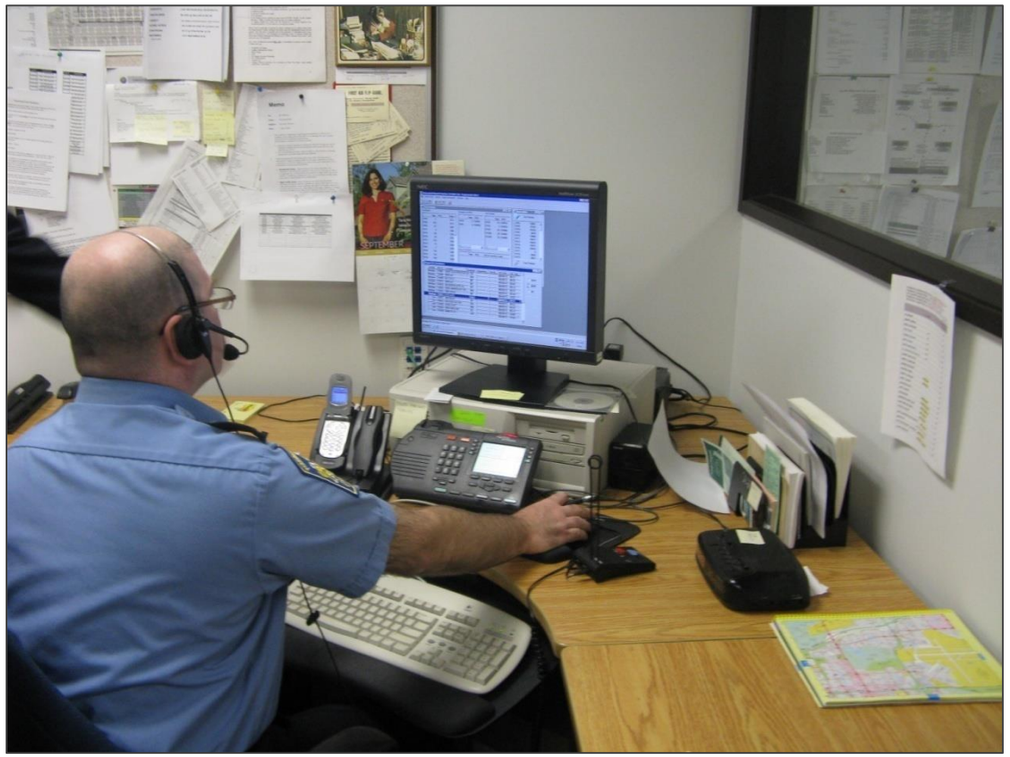
» BENEFITS

- An important revenue control feature
- Large, easy to read displays
- Custom messaging possible

Successful Revenue Control

is Partly a Matter of Organization and Detail Orientation

Effective auditing relies on detailed reviews of individual transactions.



- A systems based approach to auditing leads to program success and a culture of accountability.
- Increasingly, these processes are becoming more computerized, relying on programming audits and video license plate audits, etc.

Securing Access Control Equipment

Your parking equipment can be secured with electronic access controls without the need for on-site power. These controls can be installed in virtually any parking equipment, anywhere enhancing system security and providing improved audit capabilities.

ex.


PARK-ASSURE

Electronic access control for your parking equipment without the need for on-site power

Can be installed in virtually any parking equipment, anywhere

Benefits

- Know and control who accesses or tries to access your equipment
- Know how much cash was removed, by who and when
- Easy online management, including reports
- Minimize shrinkage
- Eliminate the problem of lost or stolen keys
- Minimize vandalism of locks
- Compelling ROI- typically 30%+

How It Works

- We replace your mechanical locks and keys with our electronic locks and battery powered keys- the locks are powered by our keys
- We set up a secure online account, just for you
- Using your online account, you establish who can access what equipment when
- Our locks can only be opened by the keys you authorized at the times you authorized
- You can get an email or SMS alert whenever an unauthorized access has been attempted
- You can use your account anytime to see who has accessed what when, change access rights or generate reports

Tel (805) 962.2700 • Fax (805) 962.2712 • www.ez-assure.com • sales@ez-assure.com

- BENEFITS;
  - Know and control who accesses or tries to access your equipment
    - Know how much cash was removed, by who and when
    - Easy online management, including reports
    - Minimize shrinkage
    - Eliminate the problem of lost or stolen keys
    - Minimize vandalism of locks
    - Compelling ROI- typically 30%+

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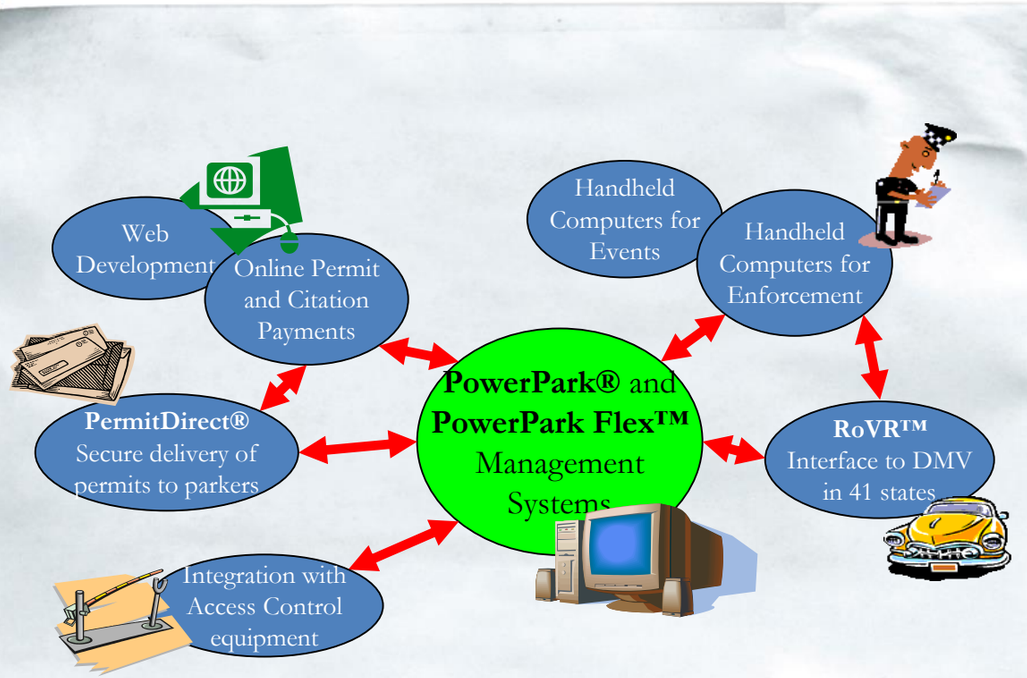
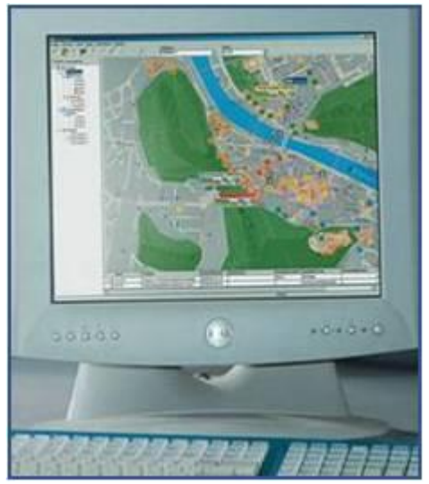
Leveraging New Technologies

Web-Based Management Platforms

Consistent management regardless of the type of parker (transient, monthly, residential, etc.) All aspects of parking management can now be integrated into a web-based management system.



ex.



» Management information at a glance: vehicles, citations, names, addresses, etc. on a single, clean, easy-to-read page.

» Open architecture allows sales/payment from anywhere.

Video Based Car Counting Systems

At SeaTac international Airport, just after the Daily Parking entrances, drivers see an electronic sign that tells them how many spaces are available on each floor.

Once you get to a floor, a sign will tell you how many spaces are open to the left or right.

Within each floor, more signs will tell you how many spaces are available in each four-row section.

ex.

» BENEFITS

- Reduced customer complaints
- Highly improved count accuracy
- Significant reduction in greenhouse gas emissions
- Extensive statistical analysis on collected vehicle data

Car Counting

Video Based Car Counting Systems

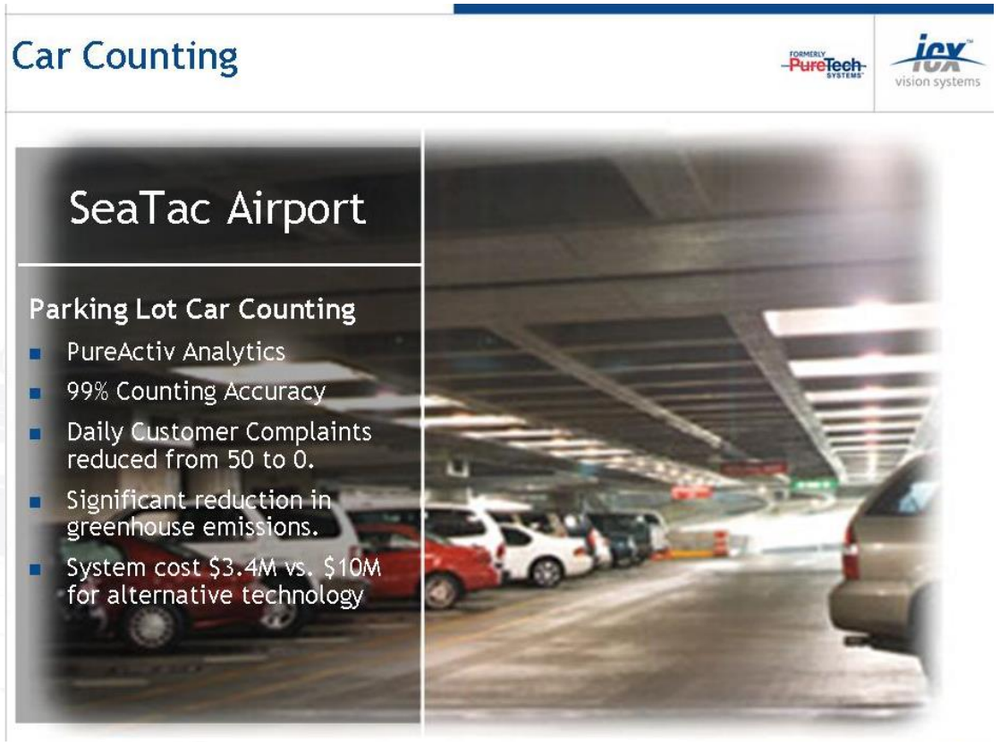
Utilizing video analytics as a vehicle count mechanism provides more data than simple loop detectors or other sensors. This new application has great potential going forward.

- Just after the Daily Parking entrances, drivers see an electronic sign that tells them how many spaces are available on each floor.
- Once you get to a floor, a sign will tell you how many spaces are open to the left or right.
- Finally, once you get an a floor, more signs will tell you how many spaces are available within each four-row section.

ex.

» BENEFITS

- Reduced customer complaints
- Highly improved count accuracy
- Significant reduction in greenhouse gas emissions
- Extensive statistical analysis on collected vehicle data

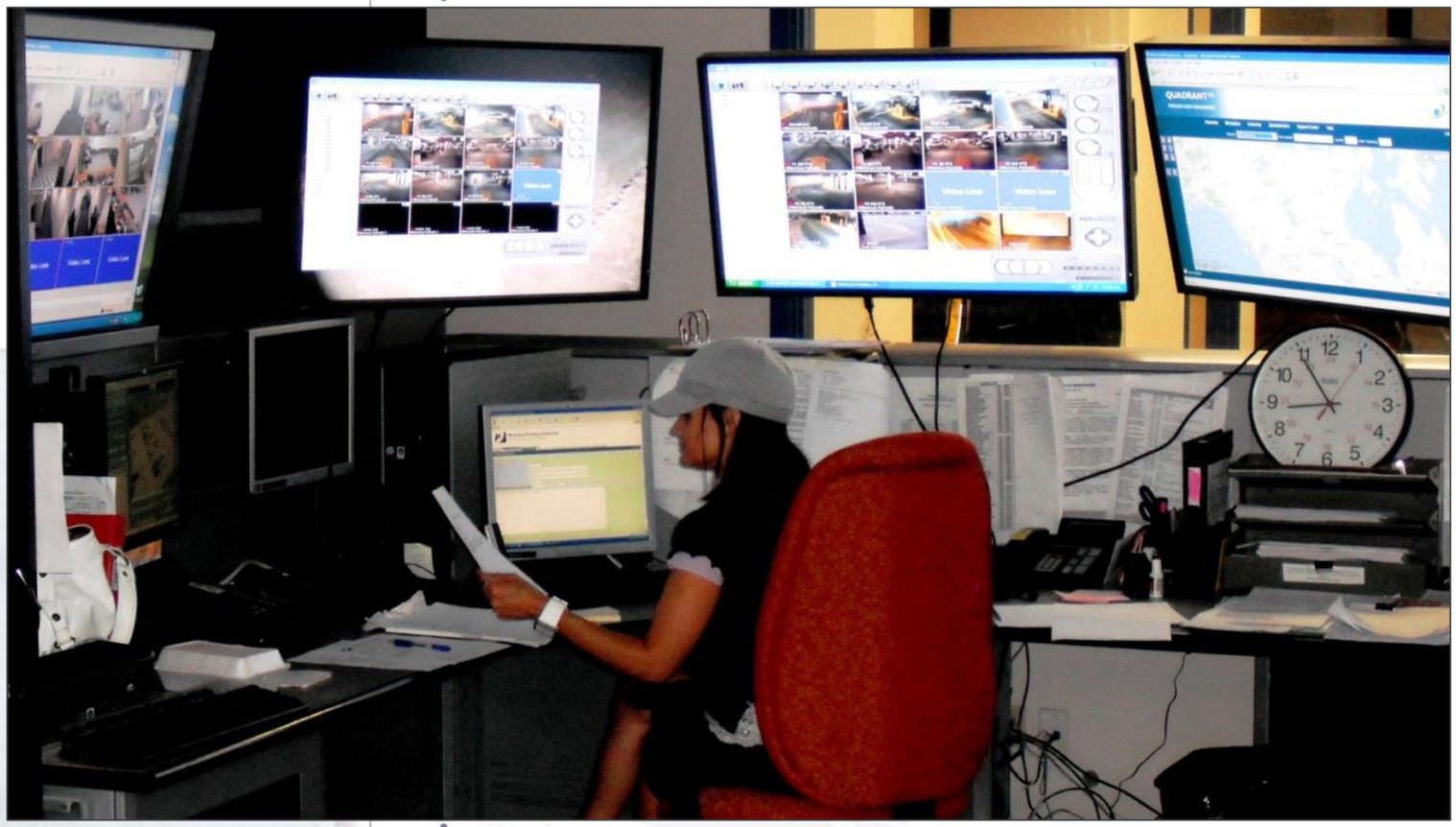


Parking Management Control Centers

As parking management programs get larger and more complex, communications, security and active systems monitoring becomes more important.

Many of the more sophisticated programs have created central dispatch and systems monitoring “control centers”.

ex.



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Signage and Wayfinding

Don't Forget Your Manners?

Someone once said, "everything we really need to know, we learned in Kindergarten"

» Remember to welcome your guests and to always say "thank you"!

ex.

When It Comes to Signage, Less is Often More!

Contrast the two approaches below:

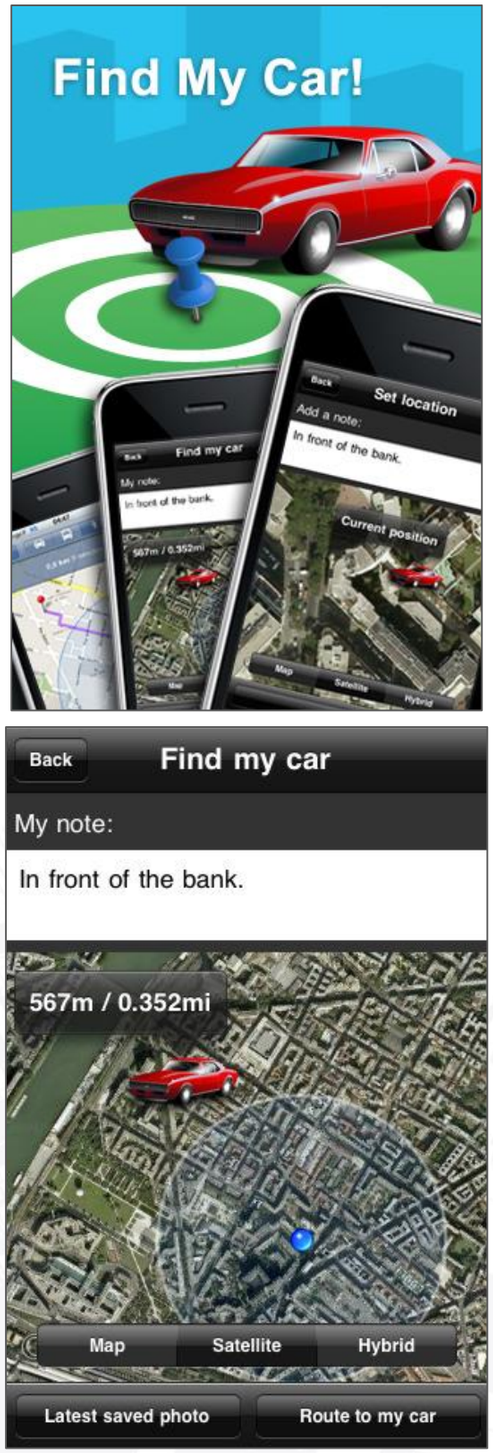
ex.

PICTOFORM

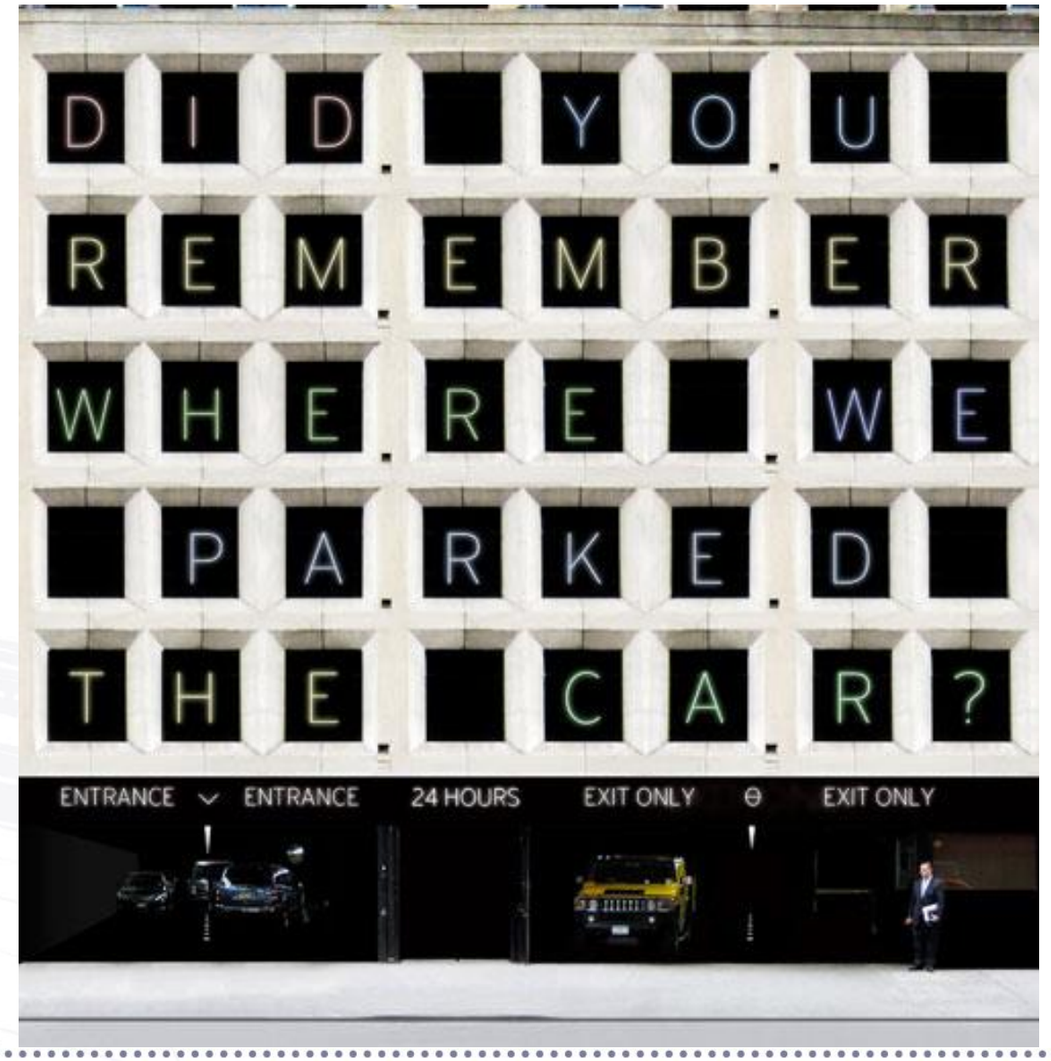
Where Did I Park?

Finding your car in a large parking facility is a common problem.

Signage and wayfinding are important, but for those that don't read signs, here's an App for you!



ex.

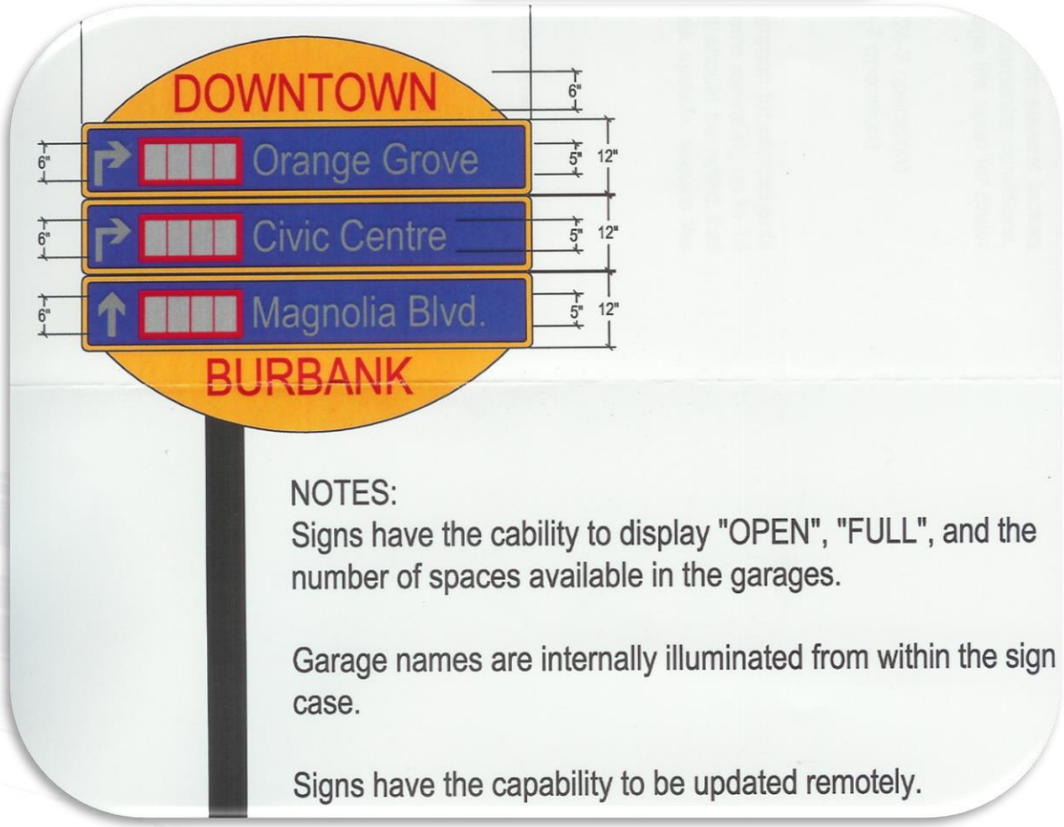


Parking Guidance Systems

The downtown wayfinding and signage program in Burbank, CA are designed to read by motorists. Font sizes are calculated to be read based on driving speeds.

- The variable message signs are internally illuminated for high visibility at nights.
- Burbank chose to only display “open” and “full” messages instead of specific space availability numbers.
- They also have the capability of being updated from remote locations.

ex.



Parking Guidance Systems

The downtown wayfinding and signage program in San Jose uses a combination of static elements with variable message components to display space availability.

- The signs also provide full panel variable message components to accommodate new destinations or special functions that may only occur on an occasional basis.

ex.

Integrating with Downtown Wayfinding

ex.

The downtown wayfinding and signage program in Tucson, AZ is organized by downtown districts.

Each district has it own unique icon, colors and graphics.

- Downtown merchants and related agencies were given a “graphics CD” so that they could integrate the wayfinding graphics into their marketing and advertising.
- This approach helps keep the graphic colors, fonts, icons, etc. consistent.

Integrating with Downtown Wayfinding

The downtown wayfinding and signage program in Fort Wayne, IN is organized by downtown districts and then by major activity centers/destinations.

ex.

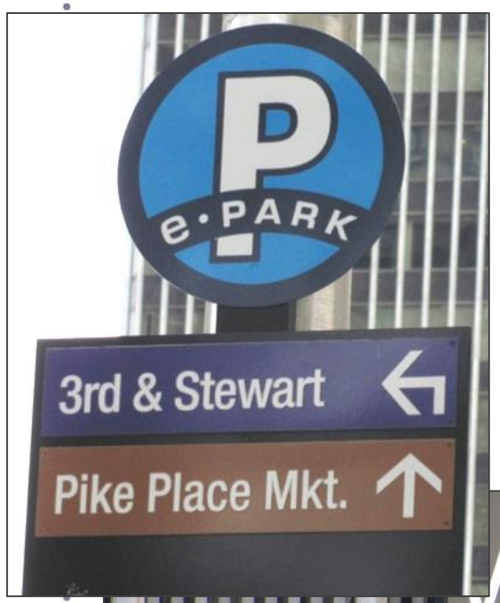
- Parking is addressed by a Green P with directional arrows that can be applied to specific destinations of district identifiers.
- This approach keeps the primary intent of the signage focused on primary destinations and allows for flexibility as parking options are added or change over time.

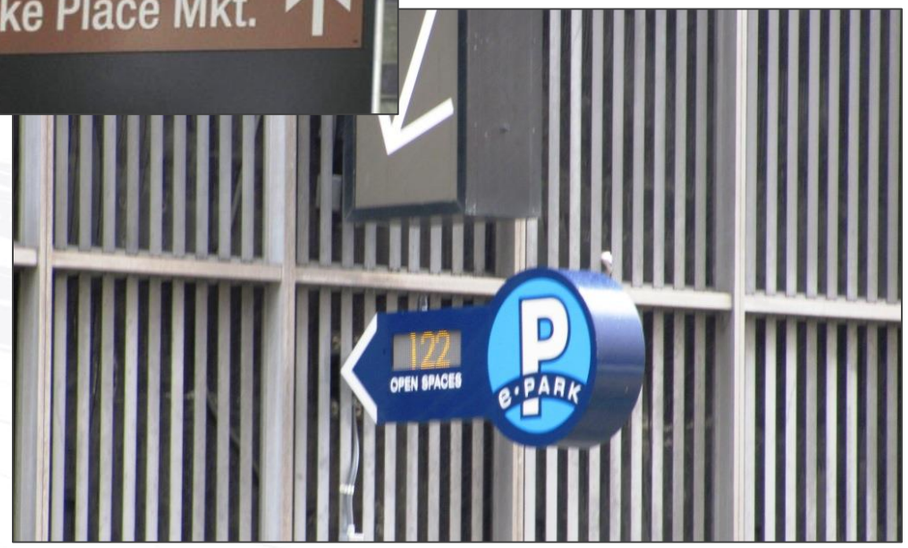
Parking Spaces Available Signage

Seattle's new "E-Park" program provides wayfinding and space availability information for a combined system of public and private short-term parking options in the downtown area.

The signage is a combination of static and variable message signs.

ex.





Super Graphics

Using “Super Graphics” to indicate garage level, elevator and stair locations, etc. is a fairly common, but very effective best practice.

» Using these graphics to orient parkers to surrounding streets is another recommended practice.

ex.

Color Banding and Consistency

Combining crisp, clean graphics, bright colors and ***"color bands"*** to indicate garage level, elevator and stair locations, is another effective best practice.

- Color banding can tie sometimes confusing three dimensional environments together graphically.
- They can more exactly differentiate where on level stops and another begins.
- They can also "lead" patrons directly to destinations such as elevators.

ex.

Garage Signage Principle # 1: I am parked on_____.

Fundamental parking signage principle # 1 is simple: When you step out of your vehicle in any space, You should be able to look around and be able to identify where you are parked (i.e., Level 4, Row A).

- This applies to parking lots as well as garages.
- The more creative and memorable the signage clues provided, the better.

ex.

2 Dimensional Art – 3-D Effects

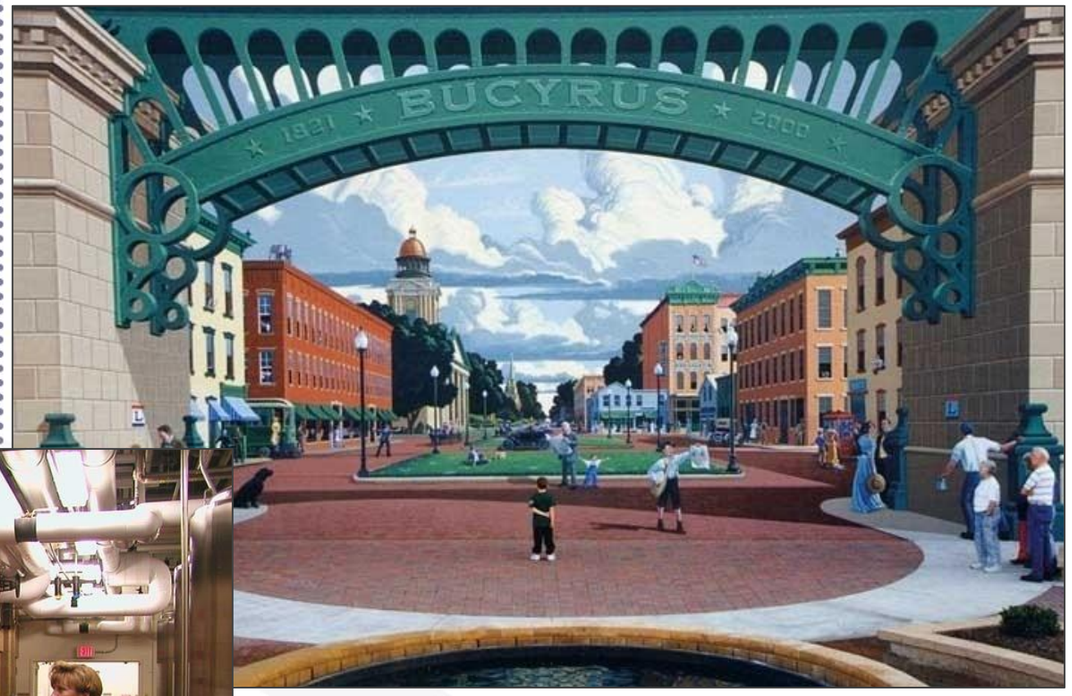
Parking garages have many large blank walls.

Consider this your “Canvas” for creating new and dramatic focal points using 2-Dimensional painted images with 3-D impacts.

ex.

Before:

After:



Before:

After:

Effective Use of Symbols and Pictograms

From the basic “Parking P Symbol” to international symbols to the creation of new pictograms to keep up with evolving technologies, graphics symbols have become an important part of how we communicate.

ex.

Reflective Text

The use of reflective lettering materials on internal parking directional signage improves readability, especially in below grade facilities.

ex.

Parking Signage

Can’t get anyone to take your “No Parking” signage seriously?

Try a modest exaggeration.

ex.

» This sign caught my attention? (And no, I didn’t park there.)

Well Designed Parking Signage and Graphics

Good design matters! What more is there to say?

Quality design and graphics speak for themselves and reflect positively on the program that made such a wise investment.

PICTOFORM

ex.

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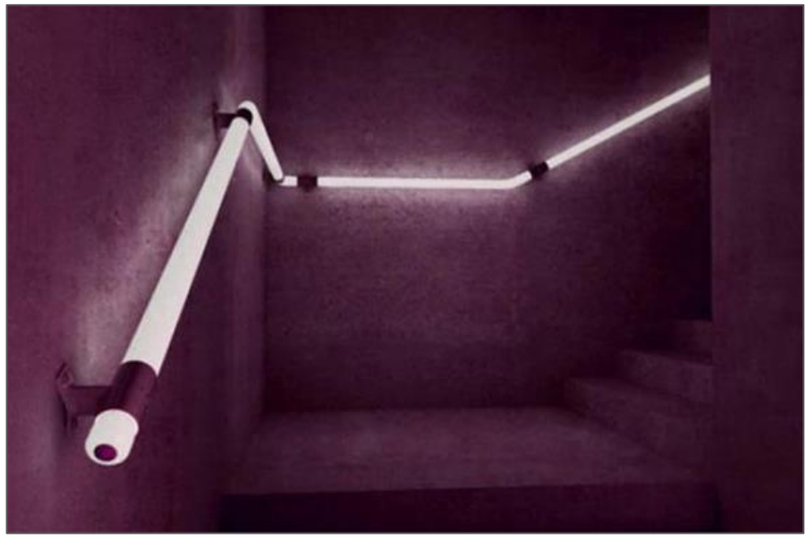
Enhancing the “Parking Experience”

Unique Touches!

Reminiscent of Luke Stairwalker, I mean Skywalker, here's a futuristic staircase handrail for the Jedi Master in all of us.



ex.

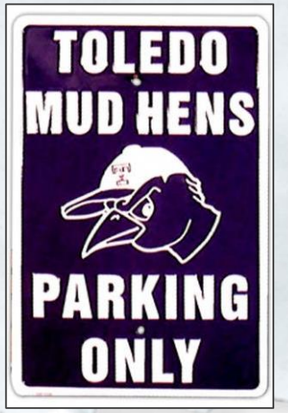
- The super cool LED-lit handrail by Croatia-based Zoran Sunjic is **perfect** for modern homes, restaurants and hot night clubs – even parking garages!
- Multifunctional, the rail lights the way, makes the passage safe, and adds a touch of fantasy.
- You can even color code to match your floors (OK, maybe not.)

Special Touches!

Understanding the needs of your customers and implementing services to meet their special needs is always a winning strategy.

ex.

- Reserving convenient spaces for specialty groups can help promote customer loyalty and appreciation.
- Its all about knowing your clientele!



Green It Up!

Add a planter or two. It's amazing the difference adding plants can make in the look and feel of a parking structure, especially around elevator lobbies and entry/exit plazas.

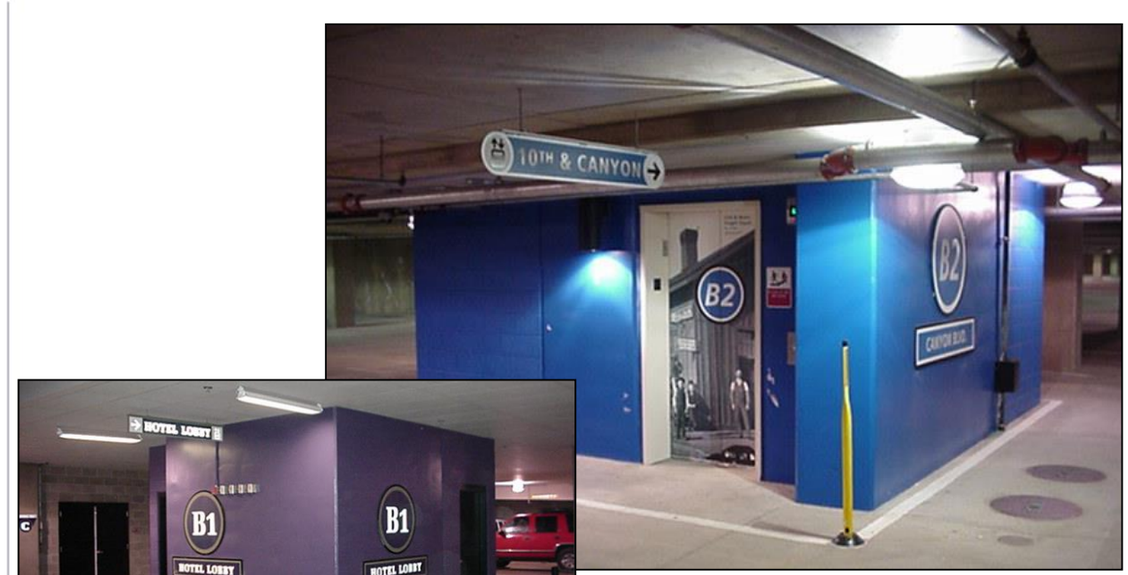
Green the whole roof if you really want to make an impact!

ex.

- At the Queensway Garage in Long Beach, planters are located at both entrance and exit plazas improving the look and feel of the parking environment. (Top left)
- Attention to little details at a City Parking Garage in Ottawa. (Top)
- If you do add significant landscaping above parking, be sure to hire a parking consultant to engineer it properly!

Add Color

The use of color is a tried and true mechanism for brightening up drab concrete structures and aiding in wayfinding.



ex.

» In this example, the colors are associated with different vertical elements and where they lead.

Customer Amenities

Customer amenities in a parking structure can include a variety of offerings including drink machines, water fountains, snack machines, etc.

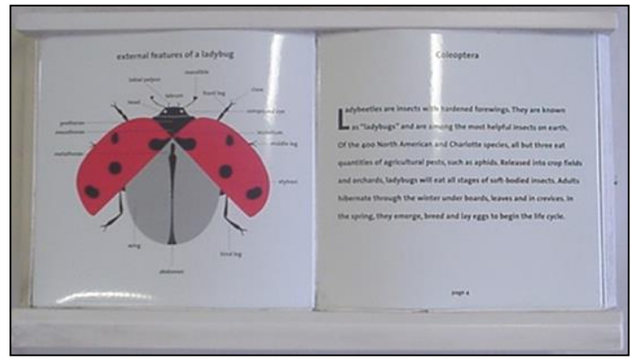
ex.

- It can also include special services such as dry cleaning drop-off, auto washing and detailing services, state vehicle inspection services, loaner “audio books”, etc.

Brighten it Up! Creative Level Theming and Wayfinding

Wayfinding aids such as “level theming” have helped make the parking environment more pleasant and interesting while providing the benefit of helping patrons remember where they parked their car.

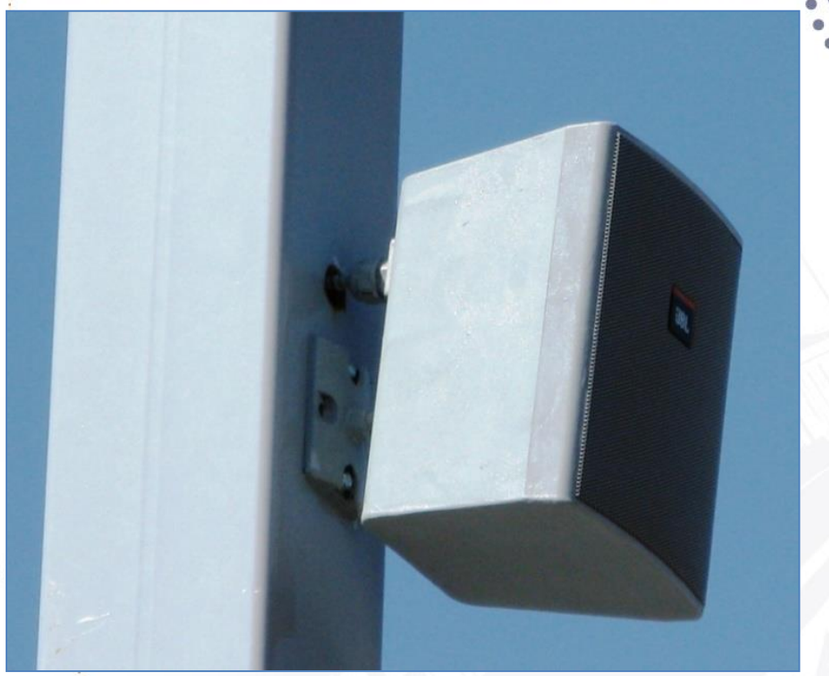
ex.



Music In Your Parking Lots?

Some upscale shopping centers are keeping shoppers dancing all the way into the stores by providing music in the parking lots.

ex.

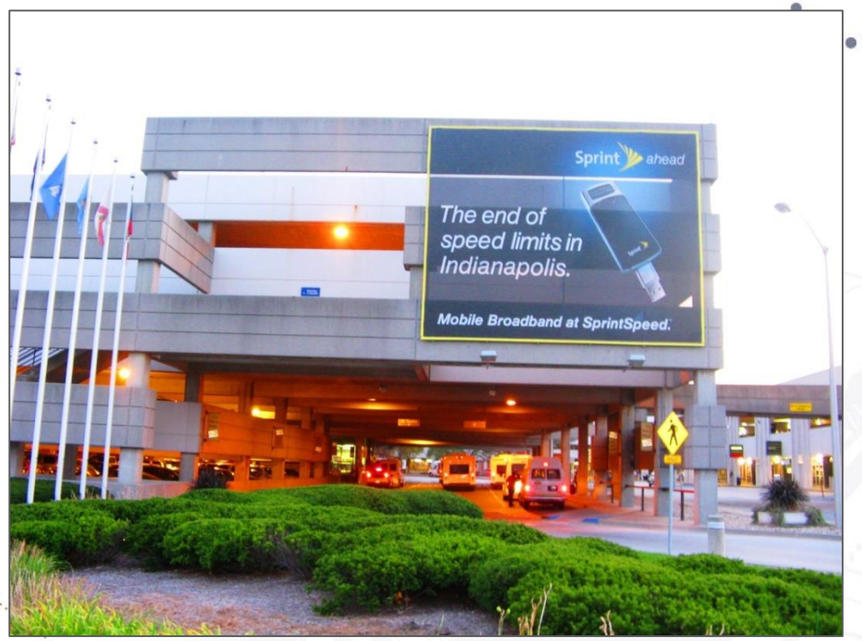


» Mall owners site a desire to “set a certain mood for their shoppers” and to put them in a positive state of mind.

Banners Can Add Color, Communications and Ad Revenues!

Some developers, hospitals and airports are taking advantage of high visibility space and cashing in on advertising potential.

ex.



» How many views per year do you think these locations generate?

Engaging Local Artists

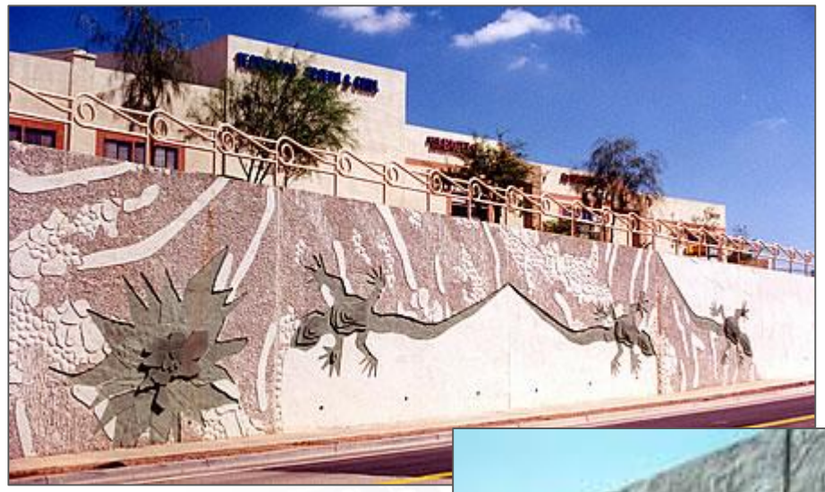
Charlotte, NC (and Bank of America in particular) has been a leader in investing in creative level theming and wayfinding as well as well as engaging local artists.

7th Street Station Garage, Charlotte, NC

Roadway and Interchange Art

If we can do this for roadways, why not parking garages! Concrete can be a great creative medium.

ex.



Art as Urban Utilities Camouflage

The writing's on the wall…or, in this case, the utility box.

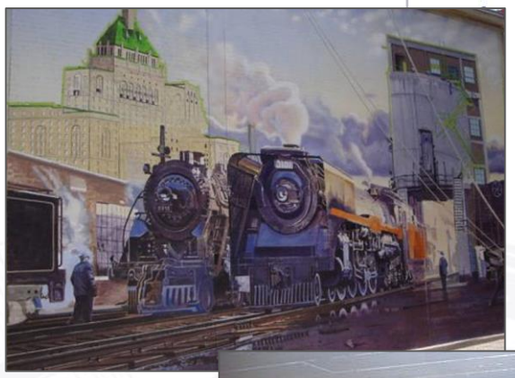
Graffiti art replaces gang graffiti and provides "street-art" for passersby.

ex.

- Urban art in the form of buildings is stenciled onto telecommunication power boxes and concrete surfaces throughout the streets of German cities. (Top 2)
- Stacked Lemon crates . (Middle)
- Musician's adorn a utility box in downtown Winnipeg. (Bottom)

Got a Blank Wall? – Add a Mural!

Parking programs can place a greater emphasis on public art. Blank walls can be an opportunity to showcase local artists, add a splash of color and interest and enliven dull parking environments.



ex.

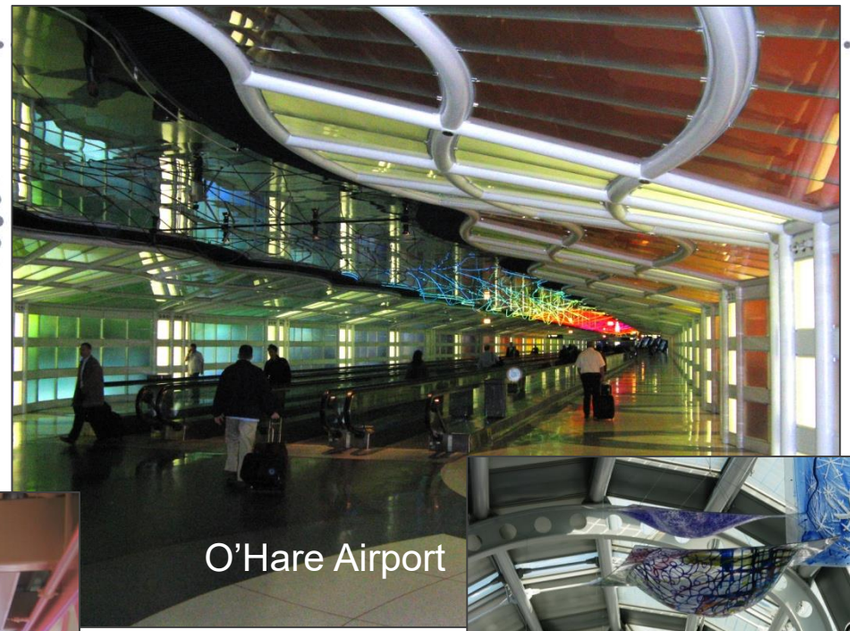
- My favorite wall mural of all time is the girl I met on my first trip to Manhattan. I still think of her when I think of New York City (Left).
- There are too many great examples to show, but here are a few.

"Jazzed up" Pedestrian Pathways

Sometimes we have long corridors or tunnels connecting parking to it's primary demand generators. Problem?

No, an Opportunity!

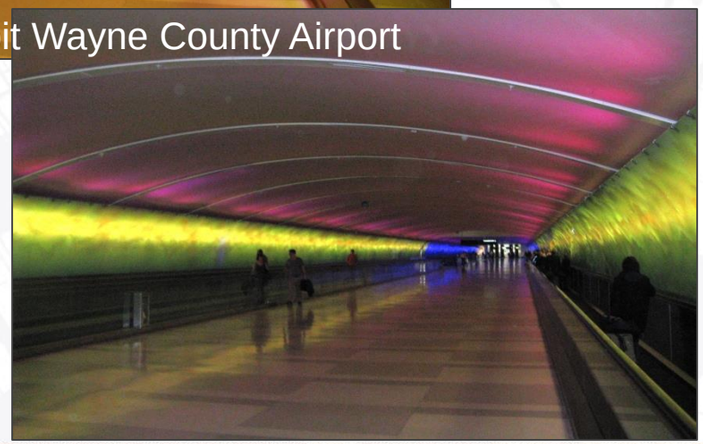
ex.



O'Hare Airport

The New Indianapolis Airport

Detroit Wayne County Airport



- Tunnels and connectors need not be dull or dark.
- These airport examples use dramatic and changing lighting, people movers, art, music or interesting "soundscapes" to create an interesting and positive experience.

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Creative Level Theming as a Wayfinding Strategy

In addition to visual clues, some parking structures are also using music to remind patrons where they parked. A different style of music is used on each floor.

ex.

- O'Hare airport in Chicago (Standard Parking) was one of the first to use this wayfinding enhancement strategy.
- The music is reinforced on each floor by dramatic graphics - distinctive to the specific song being played on that floor - displayed in the elevator vestibules and throughout that level's parking bays.

Shade, Protect and Even Generate Power and Increased Revenue

Adding shade structures to surface lots parking or deck rooftop spaces to enhance customer service and increase utilization and parking revenues.

- The initial investment varies based on type of product, but generally runs in the $700 - $1,500 per space range with an average ROI in ranging from 1.5 – 2.8 years.
- Parking shade structures can also have integrated photovoltaic panels to generate solar power.

ex.

Dramatic Lighting – Now that makes a statement!

Lighting can set your facility apart from the background and create dramatic affects.

ex.

» Indirect lighting in parking facilities and be very effective and attractive. (Right – Parking Garage at the Museum of Art in Milwaukee, WI.)

Happy Holidays!

Nobody wants this experience at Christmas! (Especially Santa)

ex.

» Now this is a little more like it!

» And if you're really in the spirit!

PARKING | The Next Level

PARKING MANAGEMENT & DESIGN - **Best Practices**

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Revenue Enhancement Strategies

Advertise On Your Tickets

Advertising on parking tickets, valet tickets and parking “booms” can effectively eliminate tickets expenses from your operating expense budget, as well as creating an opportunity to market downtown venues and attractions.

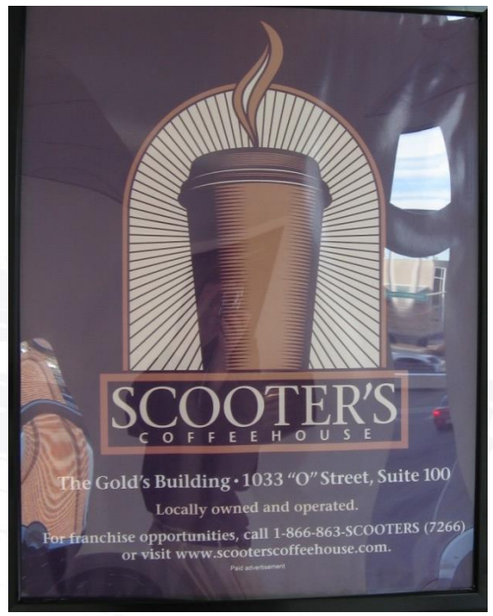
ex.

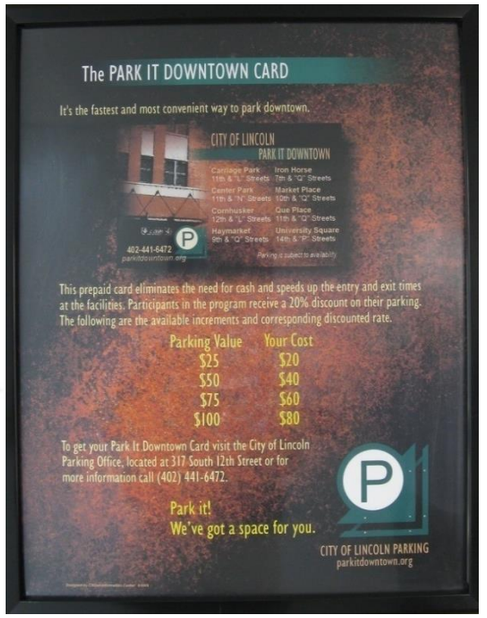
www.advertickets.com

Advertise In Your Facilities

Advertising in elevator lobbies, sky-bridges and other areas with high levels of pedestrian traffic can generate additional parking program revenues. This can also be an effective way to promote parking programs and services.

ex.





Alternative Revenue Sources

There are several sources of alternative revenue available in parking systems, that most systems don't take full advantage of. These options often provide additional value to clients.

ex.

- Examples include advertising, drink and vending machines, ATM machines, etc.
- Another example is the provision of bike lockers, bike tire pumps, etc.

Parking Brokerage Services

Parkingspots.com connects those needing a parking spot with those renting parking spots. The service allows you to find parking close to downtown, the airport, your office, your home or wherever else you need it. Easy, affordable monthly rentals where you want, when you want!

ex.

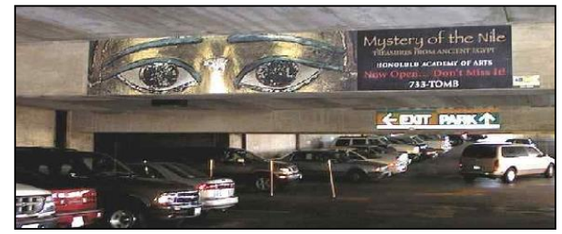
- Primarily focused on the US and Canadian markets Parkingspots.com is a virtual parking marketplace.
- Locate your ideal parking spot by city, by postal or zip or using Google maps.

Ad Walls

The use of “Ad Walls” is a good example of finding creative alternative revenue sources. It also adds color and interest to typically dull garage environments.

- This strategy can make use of a variety of surfaces including columns, beams and even gate arms.

ex.



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Expense Reduction Strategies

Automated Parking Systems

Labor Expenses

- Parking facility staffing can be the single largest expense item (ranging from 50% to 70%)
- This expense typically includes payroll, taxes, benefits, training, recruitment, etc.

  - Winnipeg reduced labor by ~25% using pay-in-lane off peak
  - Texas Medical Center reduced labor by more 35% using pay-on-foot

ex.

Opportunities to reduce labor expenses

- » Use automated parking technologies
- » Review lane activity to ensure efficient coverage
- » Improve employee retention
- » Review market pay rates
- » Consider outsourcing
- » Encourage cross-training
- » Regularly review insurance/benefits costs
- » Improve passive security
  - Reduce staff needs and reduce liability

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New High Efficiency Lighting Products

Recently, there have been significant improvements in the cost, performance, and application of LEDs for a variety of lighting applications.

The energy saving potential of LED lighting, as compared with conventional lighting, ranges from 50 to 90 percent.

ex.

» Additionally, LED lighting technology offers benefits of extended operating lifetime (up to 100,000 operating hours), small sizes to expand fixture design options, and improved optical quality and control.

Energy Conservation

Having separate electrical circuits for parking facility lights on the exterior side of parking bays as well as the roof level can save thousands of dollars per year in energy costs.

ex.

- The photo to the right shows an example of this best practice. The circled lamp is off during the daytime hours while the interior row of lights in the same bay remain on.
- In this application the exterior row of lights are tied to photo cells in the event light levels are reduced to a certain point such as during a thunder storm.

Limited Transient Customer Volume? Consider Meters.

For situations where there are only a limited number of transient spaces within a facility, controlling or charging for those spaces with meters can be a cost effective alternative to traditional exit cashiering.

- In a facility with less than 100 transient spaces (the rest were reserved for monthly parkers) the revenue stream from the transient spaces would not justify two shifts of exit cashiers, plus supervision, fee computers, booths and other capital items.
- In this case, installing meters was a more cost effective option.
- Note that there are still staffing costs with this option as the meters need to be enforced and the revenue collected.

ex.

Track Warranty Expiration Dates

Review equipment and facility related warranties

- Ensure necessary work is completed before warranties expire.
- Carolinas Medical Center saved $15,000 by scheduling a tour of parking deck expansion joints (with the expansion joint company representative) 6 months prior to warranty expiration.

ex.

- Damaged joints were documented with time/date stamped digital photos in a letter to the company.

Equipment Maintenance Contracts

Consider using equipment maintenance contracts only for more sophisticated equipment (Fee computers, ticket issuing machines, count systems, etc.)

ex.

- For less complex equipment (gates, etc.) train staff in-house and create a separate budget area for “equipment maintenance non-contract” for problems your staff can’t resolve.
- One hospital parking operation saved ~ $5,000 - $8,000 annually using this approach.

The Value of Preventative Maintenance

Don't forget about the value of and long-term savings associated with preventative maintenance...

- Structural
- Mechanical systems
- Electrical systems
- Parking equipment

ex.

- Conduct periodic wash downs to remove chlorides and dirt/debris

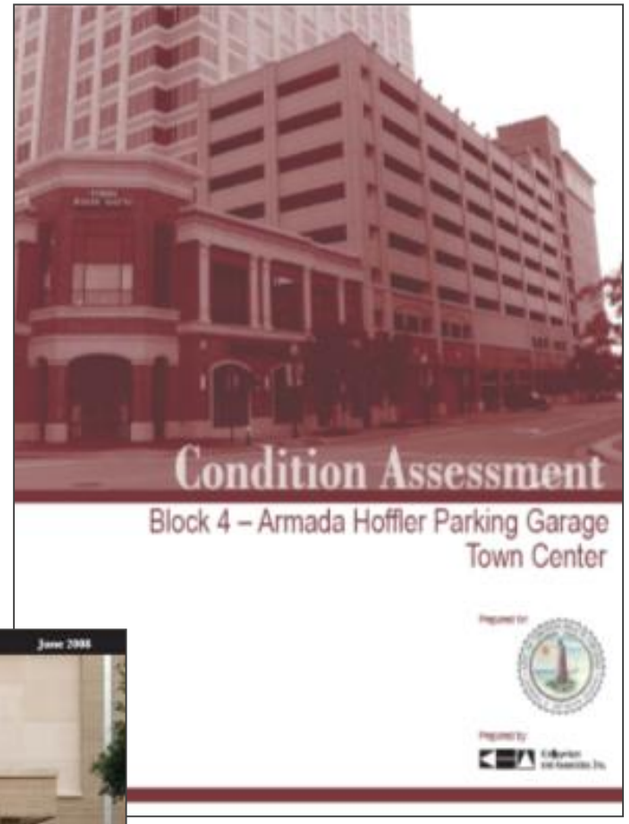
Regular Facility Structural Condition Appraisals

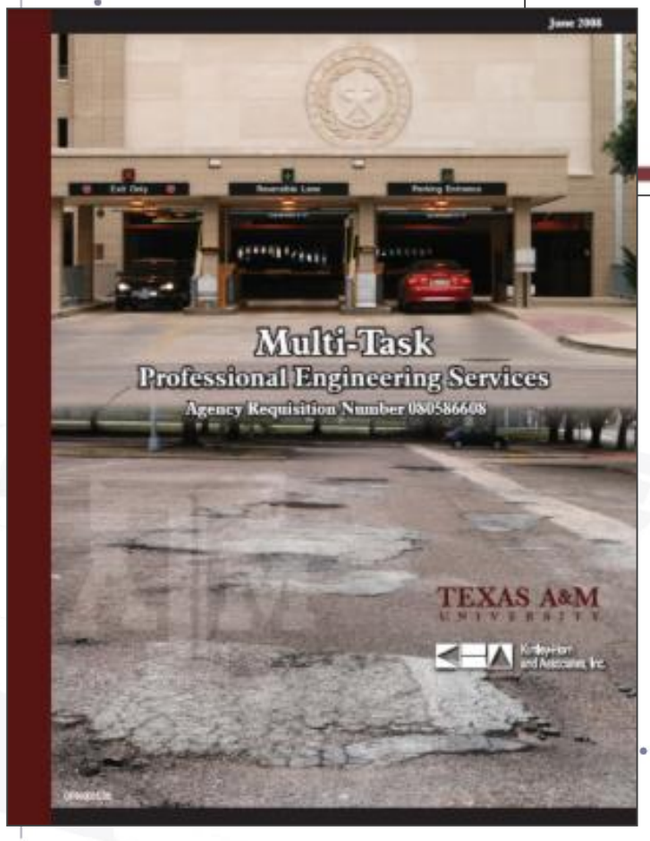
- a Good Long-term Investment

Invest in regular parking facility condition appraisals.

- These relatively inexpensive facility reviews can identify structural problems in advance of major problems that might impact operations (and therefore facility revenue or damage to customer vehicles).

ex.





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Special Programs and Promotions

Parking Coupons "Re-imagined"

Chinook Book – the popular green resource guide and coupon book – now has a high-tech sister: *Chinook Book* for iPhone, the world's first mobile coupon book.

For the first time ever, Chinook Book owners can now use their iPhone®, iPod touch® or iPad™ to save thousands of dollars at hundreds of local green businesses in the Seattle metro area.

» These e-coupons can even be used for parking and car share services at the University of Washington.

ex.

Available on the App Store

Discounted Parking to Attract Customers

If utilization of facilities is low, or if there is a desire to stimulate downtown activity, there are numerous ways in which parking can contribute to revitalization strategies.

ex.

ARENA DISTRICT PARK & DINE $3

DOWNTOWN SPOKANE

P FREE SUNDAYS FREE PARKING

P

Early Bird Specials
Discounted Rates If
In before 9:00 AM

$1 DOWNTOWN PARKING AFTER 5 PM AND ALL DAY SUNDAY

Downtown easyPARK Validation

Who Deserves A Little Something Extra?

It is a documented fact that women control the purse strings and account for the majority of consumer spending, so this practice can be made on the grounds of sound business philosophy.

» But perhaps more importantly, your own mother would approve of this policy (just ask her).

ex.

A Little Reminder Never Hurts!

Sure, we all know we should lock our car and take our keys, but …

- "I was just running in for a minute".
- "I was just picking up a prescription and was worried about my dad?.
- "I looked and there was no one around…"
- "It seemed like such a safe neighborhood".

» A little reminder might make all the difference.

ex.

First Hour Free Programs

First Hour Free programs are effective alternatives to traditional parking validation programs.

ex.

- In communities where we have assisted in implementing these programs we have seen increases in both revenue and facility utilization as well as positive community support.
- A thorough revenue assessment is recommended before undertaking a first-hour free program.
- Implementation of these programs are often accompanied with other adjustments to back-end parking rates.

On-Line Parking Coupons

Looking for a way to attract new customers, consider the time-tested use of coupons with an on-line spin - printed from a website.

ex.

- Placing coupons on your website or on the websites of related groups can be a positive way to invite new customers to your facilities.
- The coupons can also be used to promote new services.

Sponsorships/Fund Raising

Did you know that a parking lot, parking structure and/or light pole banner program could be a fundraiser for your parking system or downtown?

ex.

- Project Graphics assists municipalities, institutions and various civic organizations in developing or establishing parking structure and/or light pole banner displays as a repetitive source of revenue.
- Reviewing zoning requirements is recommended.
- www.projectgraphics.com

Contact Sylvia Klein
klein@projectgraphics.com
ph: 800-655-7311 x 314

V.I.P. Service Programs

Some parking systems have developed service programs through local vendors to provide “VIP” services for monthly customers.

Examples of VIP services include: Vehicle Washing/Detailing, Oil Changes, Dry Cleaning, etc.

ex.

- The Downtown Toledo Parking Authority’s VIP program directs customers to a specific area within their facilities and to a VIP Services Kiosk.
- A form is completed for the requested service and the vehicle keys are deposited in a security envelope.
- The requested service is completed while the customer is at work and the vehicle returned to the VIP area by a specified time.

Validation Program Promotions

Many communities have parking validation programs that are only honored by a handful of merchants. Like everything else, these programs need to be promoted to extend their reach and success.

ex.

- The development of validation program promotions supports participating merchants, increases awareness of the program and educates patrons as to program specifics.
- The promotion noted below placed bookmarks on customers windshields and offered a chance to win a $150 Downtown Shopping Spree.

Introducing Parking Validation Downtown

WE VALIDATE
CITY PARKING FOR CUSTOMERS
Look for the P!

Visit These New Program Members

- 8th Street Salon
- April Cornell
- Art Source Intl.
- Bloemenhaus
- Body Balance
- Bookend Cafe
- Borders Bookstore
- Boulder Army Store
- Boulder Arts & Crafts
- Boulder Bookstore
- Boulder Realty Brokers
- Boulder School of Music
- Cat-Man Do
- Colorado Canines
- Costa Rican Conn.
- CTX Mortgage
- DecorAsian
- Eastern Accupressure
- Elena Ciccione
- En Vision
- Express Press
- Feather Thy Nest
- Fiori Flowers
- Fleet Feet Sports
- Fresh Produce
- Frolic Shoes for Her
- Guaranty Bank
- Hello Mommy
- Heritage Bank
- High Crimes Books
- Hurdle's Jewelry
- Inlighten
- Jila Design
- John Atencio Jewelers
- Juanita's
- Little Mountain
- Lolita's
- Middlefish
- Millstone Evans
- MontBell
- Morning Star
- Paul Morrison Colours
- Pedestrian Shops
- Peppercorn
- Perry's Shoe Shop
- Pharmaca
- Pompadours
- Rio Grande
- Rocky Mtn. Joe's
- Smith-Klein
- Starrs Clothing
- The Parlour
- Tom's Tavern
- Walnut Brewery
- Weekends

Win $150 Downtown Boulder Shopping Spree

Visit www.boulderdowntown.com/parking.htm or stop by the information kiosk near 13th & Pearl to learn more about parking validation and to register for your chance to win.

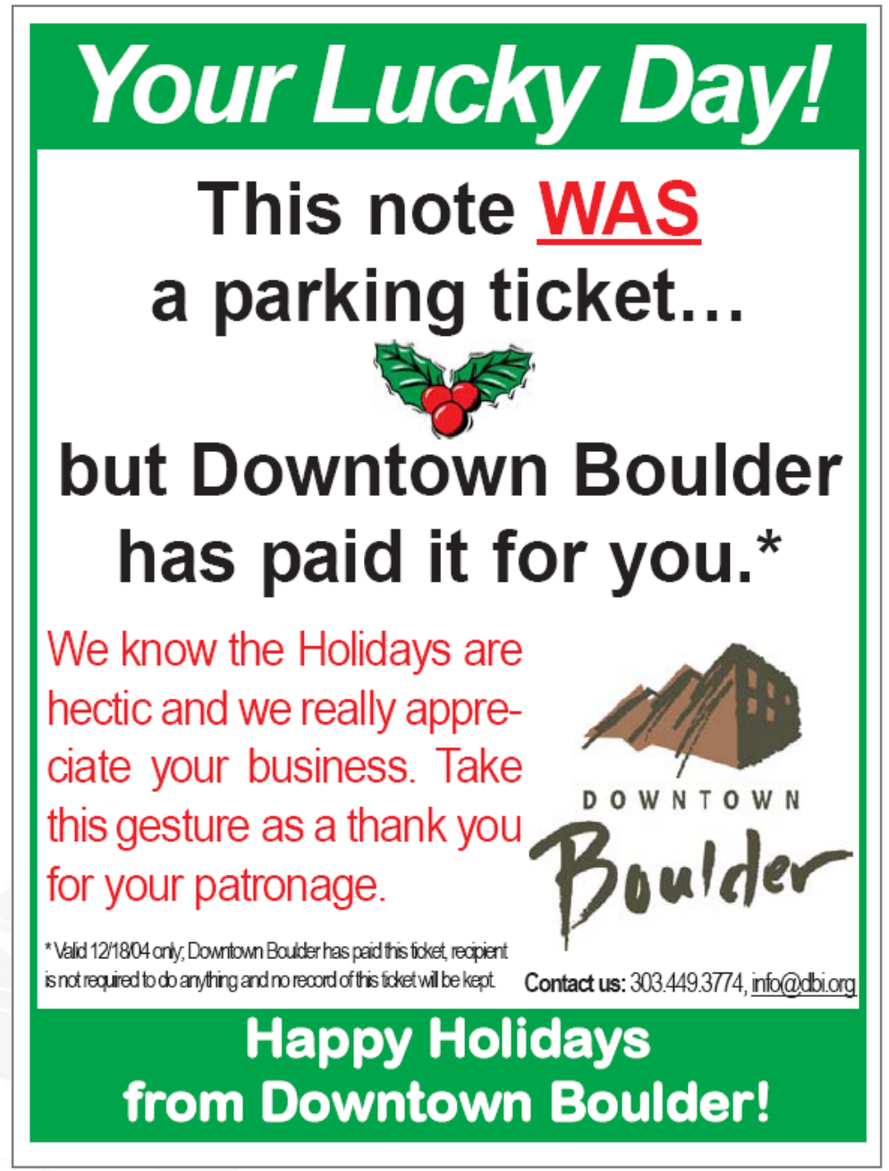
DOWNTOWN Boulder
www.boulderdowntown.com/park.ht

Your Lucky Day!

Holiday parking ticket amnesties and other forgiveness programs are tools to balance the need for parking enforcement with business encouragement through customer appreciation.

- The Downtown Association paid over $6,000 in customer's parking tickets over the Christmas holidays in Boulder.
- In other communities, the parking system simply suspends parking enforcement or replaces citations with holiday notices.

ex.



Family Friendly Parking!

If you are a parent with small children, you will love this idea!

IKEA located and designed a special a special parking area out of the main traffic flow especially for family parking.

- The “Family Friendly Parking” area is near the entrance and also near children’s play area that is just inside the door adjacent to this lot.
- The lot is essentially a cul-de-sac which also helps minimize traffic and eliminates cut-through traffic.

ex.

Kimley»Horn

Ch.
28

Sustainable Parking Design & Management Strategies

Demand Responsive Parking Pricing

Why it is Important?

- Circling for parking accounts for approximately 30 percent of city driving.
- Reducing this traffic by helping drivers find parking benefits everyone.
- More parking availability makes streets less congested and safer.
- Meters that accept credit cards reduce frustration and the need for parking citations.
- Public transit riders, bicyclists, pedestrians, business owners, residents and visitors can all expect this application of progressive parking management policy to improve their quality of life in tangible ways.

The Ultimate Goal:
Circle Less, Live Better, Safe the Earth!

ex.

» This approach optimizes the use of existing parking resources in a way that benefits both drivers as well as everyone who spends time in our great urban areas.

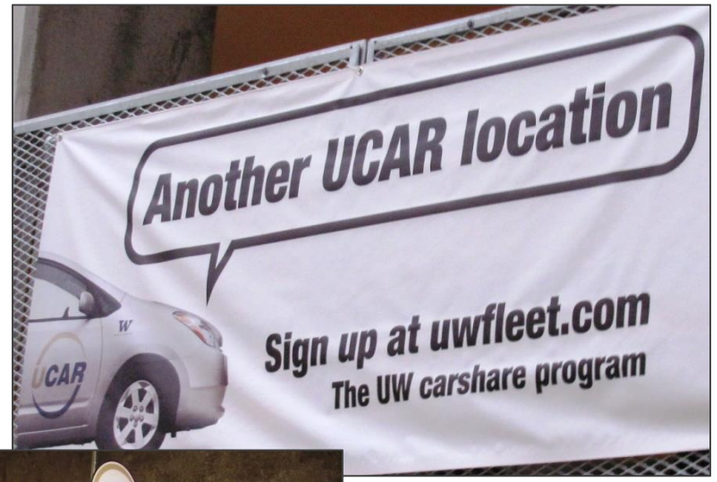
Car Sharing meets Fleet Operations

The UCAR car sharing program provides faculty, staff and students instant access to a fleet of vehicles within walking distance from campus offices.

» The UCAR is a conveniently located and economically priced Fleet Services rental vehicle available for hourly rentals. The UCAR program is dedicated to supporting the short term transportation needs of the UW community for education, research, outreach and business.

ex.

» Trip tracking occurs automatically and billing is charged directly to a UW budget number. A copy of the receipt is sent to the reservation contact and department billing contact via email.



Recycled Rubber Products

24 million tires are being recycled per year through the creation of recycled rubber molded products. The great thing about this technology is that it not only helps to recycle and eliminate millions of scrap tires annually; products can be manufactured to fit various industries, some of which include: flooring, mats, playground surfaces, track and field footing, parking lot safety products & landscape mulch (pictured above).

» 100% recycled rubber wheel stops are a durable, reliable, long-lasting alternative to traditional concrete stops. Studies have shown that over a 10-year period, concrete wheel stops could cost six times more than recycled rubber models due to cracking & maintenance issues.

ex.

RUBBERFORM
RECYCLED PRODUCTS, LLC

Green Roofs

Boston's Prudential Center has been transformed in recent decades with the construction of new buildings, shopping arcades, and landscapes.

The most recent addition, the Mandarin Oriental Hotel, includes a public garden built in 2008 on the roof of a 1964 parking garage.

- To reduce loads on the existing structure, the soil rests on lightweight fills that include expanded shale and, in especially sensitive areas, stacked foam insulation panels.

ex.

- The half-acre garden stands in deliberate contrast to the buildings around it. Its native stone walls, reused brick pavement, and lush plantings give shoppers and hotel guests a chance to step outdoors and experience a taste of the New England landscape beyond the city.

Green Roofs (Sort of)

- Don't have the budget for a "true green roof"?
- No ability to support the extra weight?
- No ability to detain water?
- An inhospitable climate?
- No funds for the long-term maintenance of a traditional green roof?

» No Problem! – Schwartz made a plastic fantastic half Japanese Zen, half French Renaissance garden.

http://www.marthaschwartz.com/

ex.

Xeriscape

Xeriscaping is the practice of water conservation through creative landscaping.

ex.

» Benefits of Xeriscaping:

- Low water consumption
- Low maintenance
- Protects water quality
- Increases health and beauty of surroundings
- Decreases pest control needs

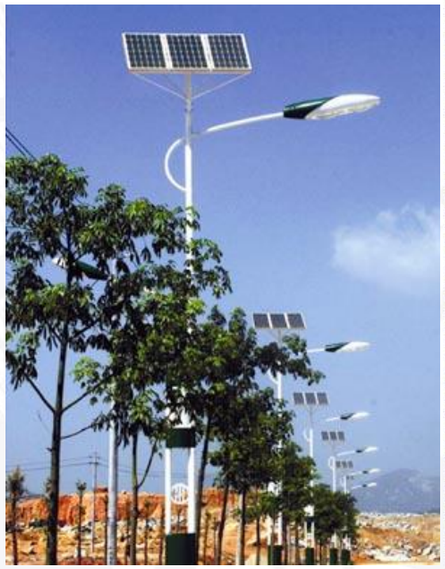
Solar Powered Parking Lot

A relatively new addition to our sustainable parking strategies is the introduction of individually powered solar parking lot lights.

ex.

Solar Parking Lot Light (S-SL27), from Greenshine has three solar panels and stronger light power, is a good solution for illumination of large areas.

Greenshine



- Each light pole/fixture is fed by an individual solar panel as pictured above.

The Eco Parking Lot

Bringing environmental technologies and green design practices under one roof is the Eco Parking Lot. The stylish design will incorporate green plantation and storm water remediation technology making it more efficient while maximizing greening potential.

ex.

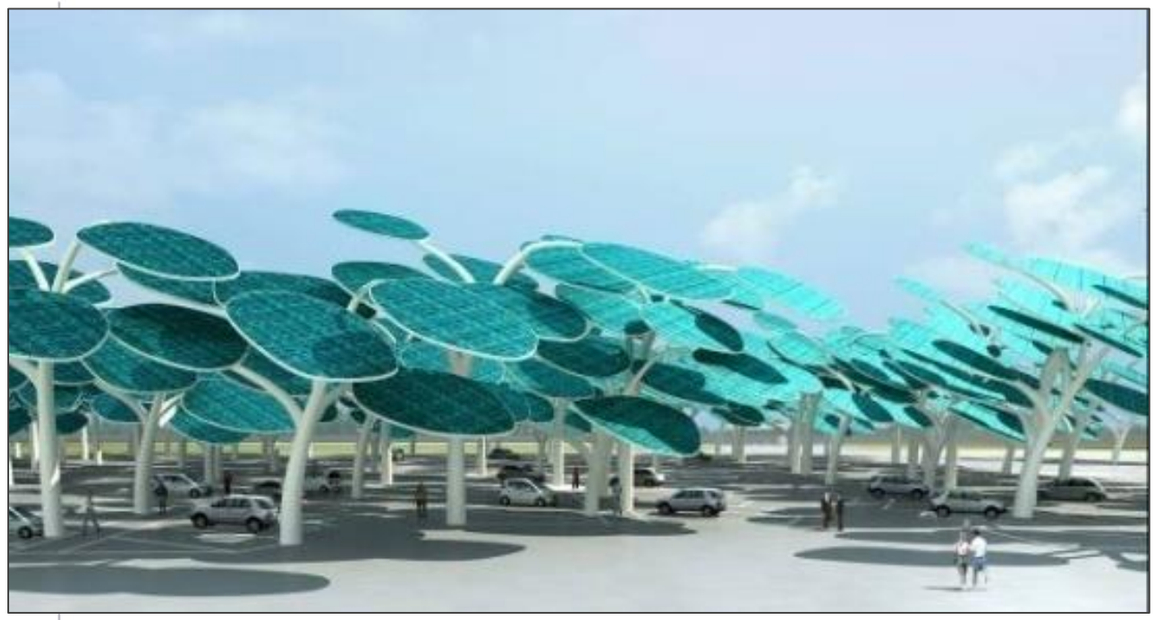
» This visual treat with special student parking will benefit the Community and city of Windsor.

Design: Green Corridor

More info:
www.greendiary.com

The Solar Forest Concept

As the name suggests, this concept brings trees like structures into action. The Solar Forest Concept consists of trees that are made up of photovoltaic leaves, whose sole purpose is to collect solar power.



ex.

- At the “trunk” of each tree is a power outlet that is used to charge up electric vehicles.
- Apart from providing charge, the photovoltaic “leaves” also gives shade to the cars.

Designer: Neville Mars

More info:
www.greendiary.com

The Solar Parking Concept

Offering a dual solution to parking and charging of electric vehicles as well, the design proposes the wireless transmission of charge from the solar canopy to the charging coil embedded in the asphalt and later, to the car battery.

ex.

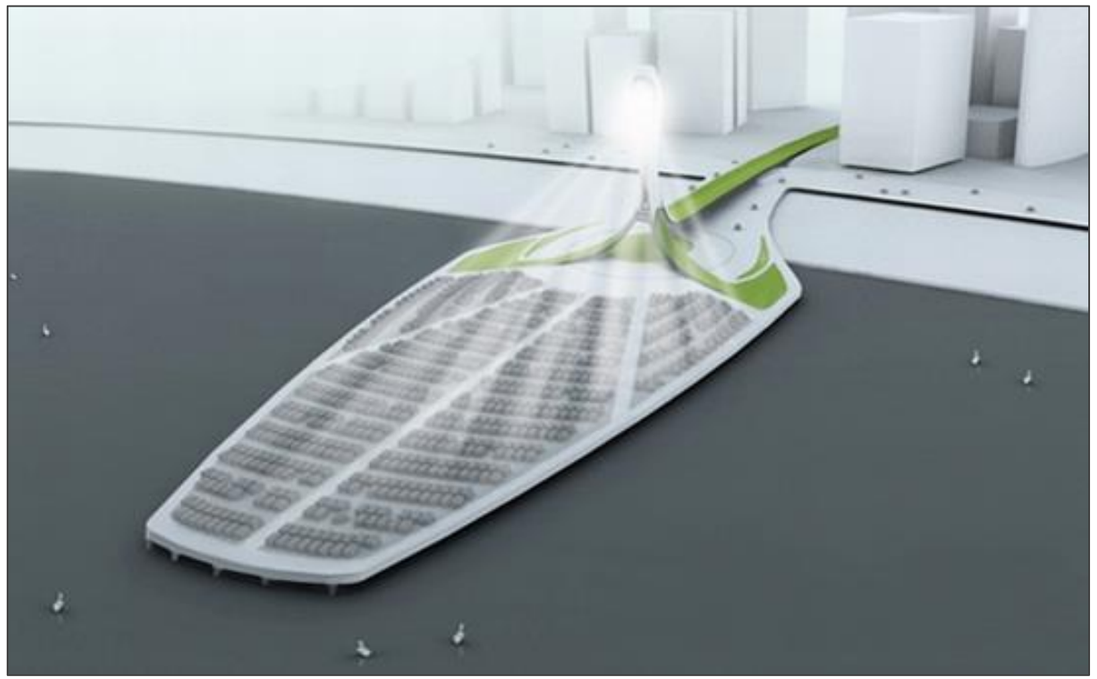
- After sensing an electric car parked, the parking system automatically starts the wireless charging process.
- Once the car's battery is full, the sensors embedded in the asphalt stop the charging process.

Designer: Nejur Andrei

More info:
www.greendiary.com

The Solasis Light Tower:

Here is a concept offshore parking area that generates solar energy to recharge electric cars and add valuable juice to the grid.



ex.

» This proposed renewable energy generating parking lot is equipped with a solar power concentrating tower that uses the windshields and hoods of cars as sun tracking and concentrating mirrors.

Designer: Klaud Wasiak and Yongbang Ho

More info:
www.greendiary.com

90 Degrees Vertical Parking System:

The 90 degrees vertical parking system, one-of-a-kind parking concept parks your car vertically.

ex.

- While you tuck your vehicles into the parking lot, the panels on the flip-side use solar panels to energize electric vehicle batteries.
- Along with power generation, the unique system allows three cars to park vertically where normally a single car is parked.

Designer: Baita Bueno

More info:
www.greendiary.com

Green P Parking System:

The concept is based on the decentralization of parking systems into many smaller spots that can be placed in unused spaces such as under flyovers and bridges.

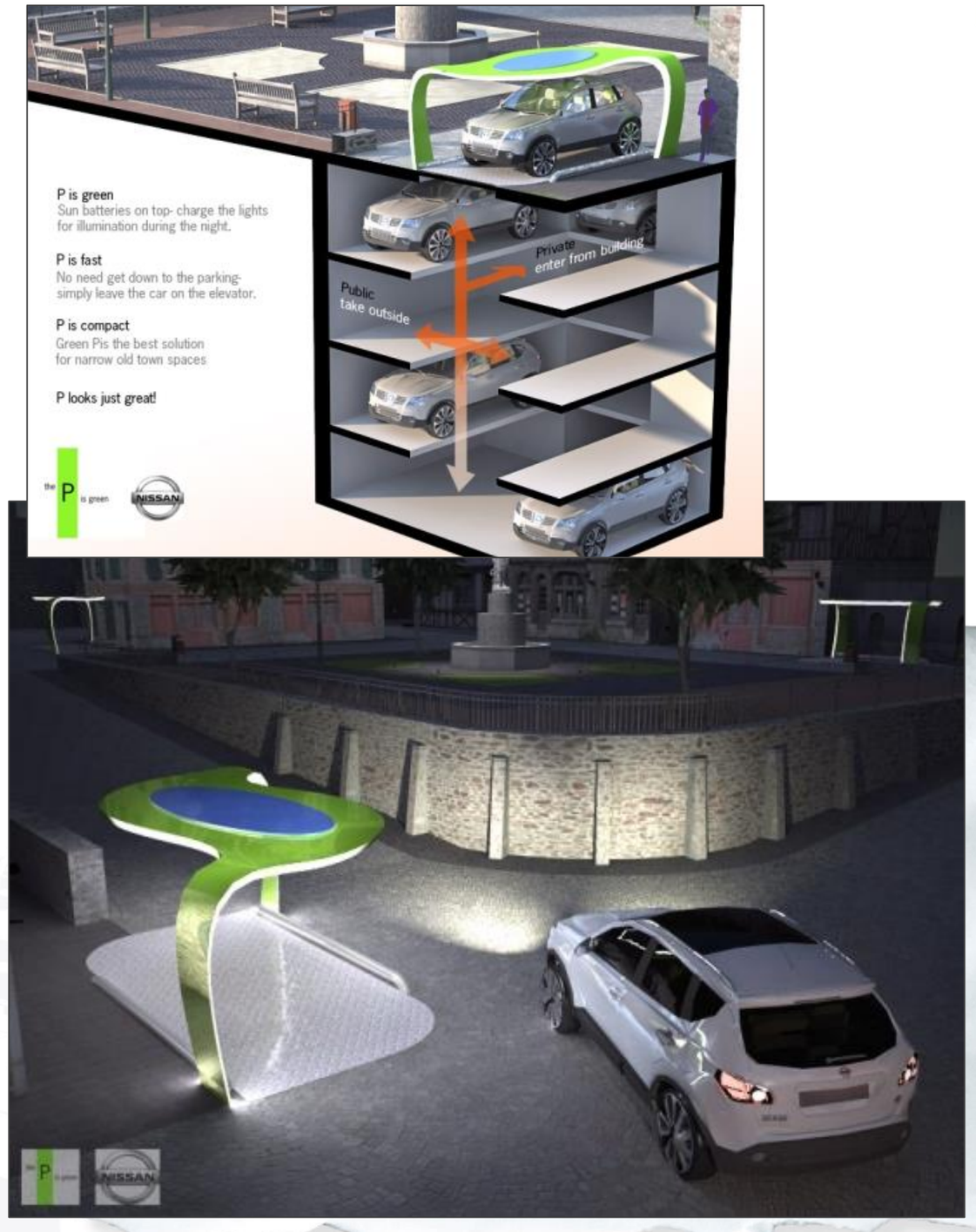
ex.

» The Green P system also includes a lighting system that can replace or supplement ordinary road lights by charging them with solar energy generated by panels installed on the Green P's roof.

Designers: Algis Berziunas and Laima Rimkute

More info:

www.greendiary.com



Energy Efficient Vehicle – Parking Perks

Some municipalities are offering free metered parking to residents whose vehicles get 50 miles per gallon, have low emissions or are powered by an alternative fuel.

ex.

Utah already offers an income tax credit of up to $3,000 for residents who buy clean fuel vehicles and some electric hybrids.

- Salt Lake City joins New Haven, CT; Fresno, CA, Boulder & Manitou Springs, CO and Albuquerque, NM, in the free parking meter program. In the last year, Austin, Texas, also approved a green vehicle incentive that provides $100 in free parking.
- Commuters in Baltimore who use low-emissions vehicles can also buy parking passes at city-owned garages at a discounted rate.

Electric Vehicle Recharging

Electric vehicle charging stations in parking facilities is coming. Also coming is a new concept of “Networked Charging Stations” that provides unique benefits when compared to non-networked charging stations.

ex.

Coulomb Technologies

Fueling the Electric Transportation Industry

» Benefits include:

- A revenue stream to pay for electricity, capital equipment and maintenance
- Ability for drivers to find unoccupied charging stations via web-enabled cell phones
- Notification by SMS or email when charging is complete
- Authenticated access to eliminate energy theft
- Green House Gas savings calculation per driver and per fleet
- Authorized energizing for safety
- Remote monitoring and diagnostics for superior quality of service
- Fleet vehicle management
- Smart Grid load management

Monthly Parking – Unbundled!

Boulder's 20 Day Punch Card is…

- Convenient: Valid in all 5 City of Boulder parking garages.
- Affordable: 20 days of parking for only $200 ($10/day).
- Available: No wait list!

ex.

- Flexible: Only pay for days you drive! Great option for anyone who works in downtown a few days a week, utilizes alternative commuting modes or who is on the wait list for a garage permit.
  - Intent: Options, options, options! Our intent is to offer more options. It was designed for long term parking (parking all day not leaving, maybe 8-10 hours) in our garages for people who do not have a long term permit.
  - Purchase: The purchaser pays $200 and receives a plastic day pass.
  - Usage: The buyer takes a ticket at the entrance gate as a normal short term parker would and upon exit gives the entrance gate ticket and punch card to the booth attendant. The booth attendant punches the card, returns it to the customer and opens the gate for the customer to exit. The booth attendant uses a pre-programmed register key and runs the ticket through.

Hotel Parking Perk for Hybrids

Hotels are beginning to offer parking perks for guests parking hybrids or electric vehicles.

ex.

Parking charges are $ 33 for Valet Parking or $ 25 for Self Parking, prices effective June 1st.

As part of commitment to the environment, the Fairmont Banff Springs is pleased to offer complimentary parking to guests bringing a hybrid or electric vehicle.

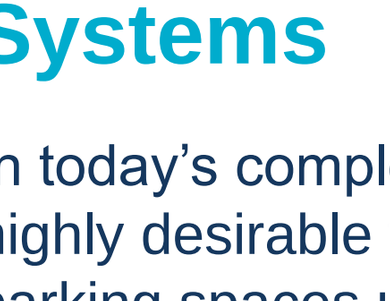
» FREE PARKING FOR HYBRID CARS IN NEW YORK CITY

- Your stay in the heart of Times Square and the Broadway theater district will be exciting and relaxing knowing your parking is free. So bring you hybrid to our front door and receive complimentary parking during your stay.

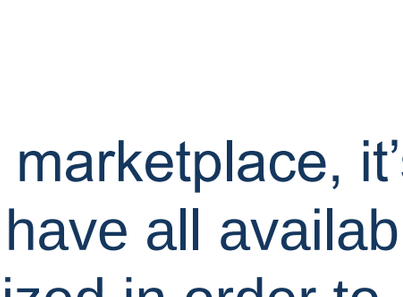
Parking Guidance Systems

In today's complex marketplace, it's highly desirable to have all available parking spaces utilized in order to maximize driver satisfaction, enhance revenues and minimize greenhouse gas emissions.

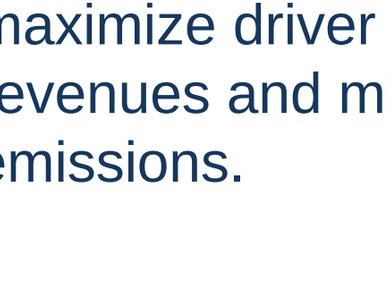
ex.



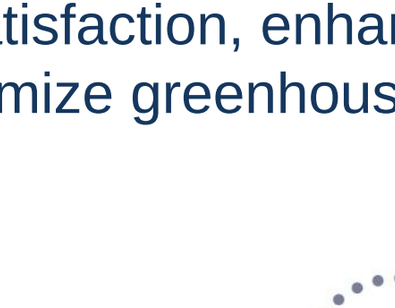
Single Space



Level Counting



Facility Counting



Way Finding

» BENEFITS

- **Parking Guidance Systems Provide:**
  - Assured Parking Availability
  - Reduced Pollution and Congestion
  - Advanced Notification to Drivers
  - Control Parking Occupancy by Facility, Level, Zone or Individual Parking Space
  - Economic, Environmental & Customer Friendly

Car Share Programs

Moving downtown?

Don’t need two cars any more?

Can’t afford a car, but need one from time to time?

Car Sharing may be just what the doctor ordered!

ex.

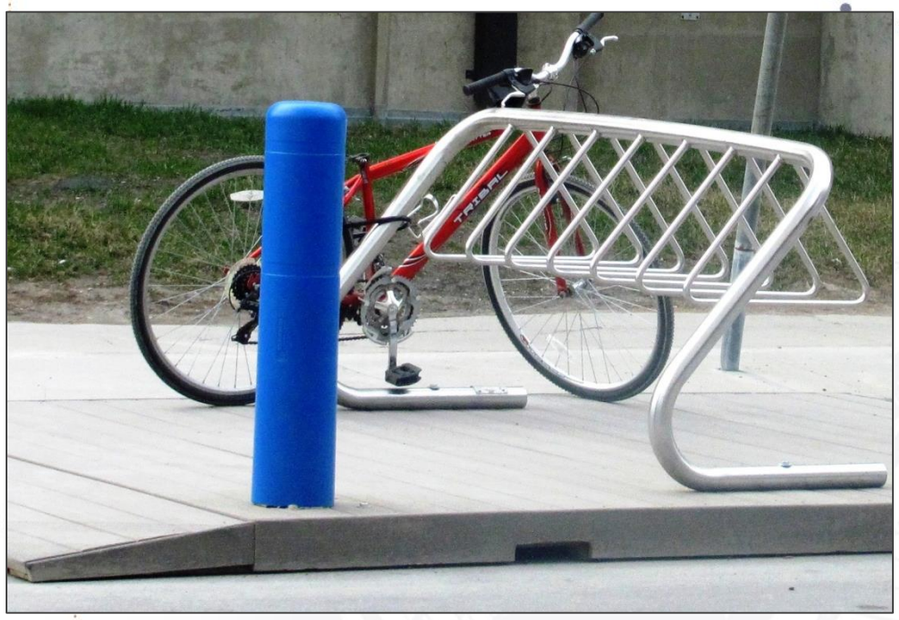
- With Car Sharing you can rent a car for a designated period.
- Pick it up at a designated spot.
- Return it to a designated spot.
- Your access car opens & starts the car.
- Your credit card is billed.
- (No don’t even have to fill it back up!)

Portable Bike Racks

How do you handle seasonal demand peaks for bike parking?

The creative folks at the Winnipeg Parking Authority created this “portable bike rack platform”.

ex.



- The base can be picked up by fork lift.
- The bike rack proper is protected by sturdy, high visibility bollards
- It can accommodate 6 – 8 bikes in a single on-street parking space.

Parking Day is Catching On!

Park[ing] Day is a grassroots movement that is gaining momentum around the country!

Once a year, urban activists around the country convert a public parking space to a “mini park” for the day.

ex.

» Organizers call it “an opportunity for community members to engage passers-by, motorists, members of the press, city leadership and yes, even the authorities, in a rational and respectful dialogue of everything from our city’s parks and public space to the environment and allocation of land to mobility issues and local beautification projects.”


Chicago


Cincinnati


Los Angeles

Kimley»Horn

Kimley»Horn

Ch.
29

Parking Facility Design and Construction

LEED Certified Parking

Yes, a parking garage can achieve a LEED Platinum certification! The University of Florida's new Southwest Parking Garage Complex includes a two story building made up of transportation, parking service, public safety offices and retail.

» The University of Florida’s (UF) new $20 million Southwest Parking Garage Complex opened in September 2010.

ex.

Designed and built by the architectural firm Pierce, Goodwin, Alexander & Linville, the parking facility, which consists of a six-level, 313,000 square-foot parking garage that can accommodate up to 950 cars, along with an attached 52,000 square foot, two story building. A 12,000 square foot office building for the University is also included.

Decorative Asphalt Treatments

Traditional asphalt is popular for it's practicality, efficiency and low cost, but some find it boring and unattractive. Decorative asphalt has all the benefits, but adds the design potential of more expensive products.

IPC INTEGRATED PAVING CONCEPTS™

http://www.integratedpaving.com/

- The shopping experience doesn't start at the front door, it starts in the parking lots.
- Extend branding into the parking lot.
- Create positive 1st impressions

Eliminate Blind Corners

Improving site lines is one of the most effective means of reducing vehicular accidents in a parking structure.

- The photos to the right shows examples of how a cut out in a sheer wall improves visibility at a blind turn.
- The use of convex mirrors to improve visibility in turns or along pedestrian paths is another good example.

ex.

Entrances – Don't Hide Them!

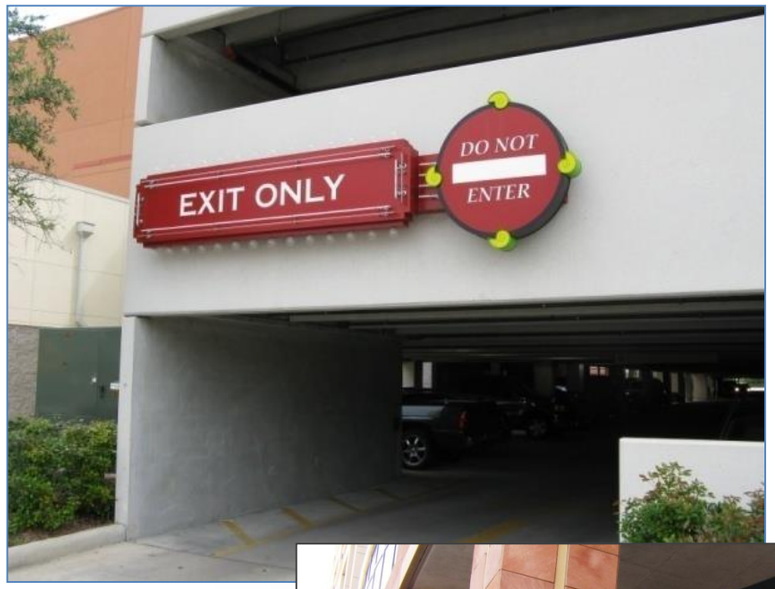
The trend towards wrapping parking structures with retail or office uses is a positive development, however, sometimes parking entrances can become hard to find.

ex.

- This photo shows that while the parking structure may be all but invisible, the entry way can be effectively highlighted.
- The overhead signage is also supplemented with a curb mounted sign perpendicular to traffic flow to further improve visibility and wayfinding.

Illuminated Entry/Exit Signs

Illuminated entry/exit signs are important to ensure that customers know “entrances” from “exits” after dark.



ex.

- Whether illuminated from within or from external sources, this is an important safety and traffic control feature that is sometimes overlooked.
- Lighted entry/exit signs should also include illumination of clearance height information.

Lighten up!

Painting or staining the interior of parking structures is one of the best ways to improve the perception of customer safety and facility cleanliness.

Painting the underside of parking levels as well as vertical elements such as wall and columns increases lighting levels through improved reflectivity.

Construction Products Division

CANYON TONE STAIN®
PIGMENTED WATER-REPELLENT STAIN WITH PLIOTEC® TECHNOLOGY

Technical Data & Application Instructions

PRODUCT DESCRIPTION

CANYON TONE STAIN is a modified, water-based acrylic, penetrating pigmented sealer. It possesses superior color stability, ultraviolet resistance, alkali and pollution resistance, and water-repellency. Toning pigments are chemically suspended in the acrylic resins, thus eliminating settling and color variations on the structure.

CANYON TONE STAIN is integrally locked into the substrate as a result of its low viscosity and microscopic penetration properties. It will not peel, crack or blister from a properly prepared concrete or masonry surface. **CANYON TONE STAIN** allows moisture vapor to escape from the building interior, while providing excellent water-repellency on the exterior through the use of hydrophobic resins.

BASIC USES

CANYON TONE STAIN is a penetrating sealer and stain with excellent water-repellent properties. It is design for use on properly prepared, above-grade, smooth or textured concrete, masonry, brick, stone or stucco. **CANYON TONE STAIN** corrects natural color imperfections in the substrate by imparting permanent color uniformity plus water-repellency, without disturbing the natural texture of the substrate. It is not designed for application to horizontal surfaces.

CANYON TONE STAIN is used as a uniform color finish on precast and poured concrete, glass fiber reinforced concrete, brick, stucco and stone surfaces. **CANYON TONE STAIN** is **not designed to waterproof concrete block or other porous substrates.** It can be used over masonry substrates to achieve color uniformity only. Contact UNITED's Technical Service Department for additional information. As a water-based system, **CANYON TONE STAIN** can be used on interior surfaces as well as exterior. **CANYON TONE STAIN** complies with all VOC regulations.

Highway bridge structures, sound walls, median barriers, foundations, tunnels, retaining walls and related building structures are all candidates for the application of **CANYON TONE STAIN.**

PHYSICAL PROPERTIES TABLE I

Property	Value	Method
Solids by Weight	40% (±2)	ASTM D2369
Solids by Volume	24% (±2)	ASTM D2697
Weight per Gallon	10.5 lbs (±.2) (4.8 kgs)	ASTM D1475
Viscosity	900-1500 cps @ 70°F	ASTM D2196
Dry Time*	20 minutes	ASTM D1640
Cure Time*	1 hour	ASTM D1640
Gloss	4.0 (60° Gardner)	ASTM D523
Permeability	10 Perms (±2) @ 4 dry mils	ASTM E96
Adhesion to Concrete/Masonry	300 lbs/sq. in. (2,069 kPa)	ASTM D3359
Low & High Temp. Service Limits	-70°F to 200°F (-57°C to 93°C)	

**Dry time and cure time at 77°F (24°C), 50% R.H.*

COLORS

CANYON TONE STAIN is available in a wide selection of natural toned colors. All other colors are custom matched by UNITED for the specific application. UNITED has the color tinting facilities to match virtually any color. Color chips or samples must be furnished to UNITED for all custom colors.

WARRANTY

UNITED COATINGS warrants to the Building Owner that, when properly applied, **CANYON TONE STAIN** will not peel or flake, will have excellent color retention and uniformity, and will act as a water-repellent for a period of 10-years from the date of application.

UNITED COATINGS
LONGEVITY BY DESIGN

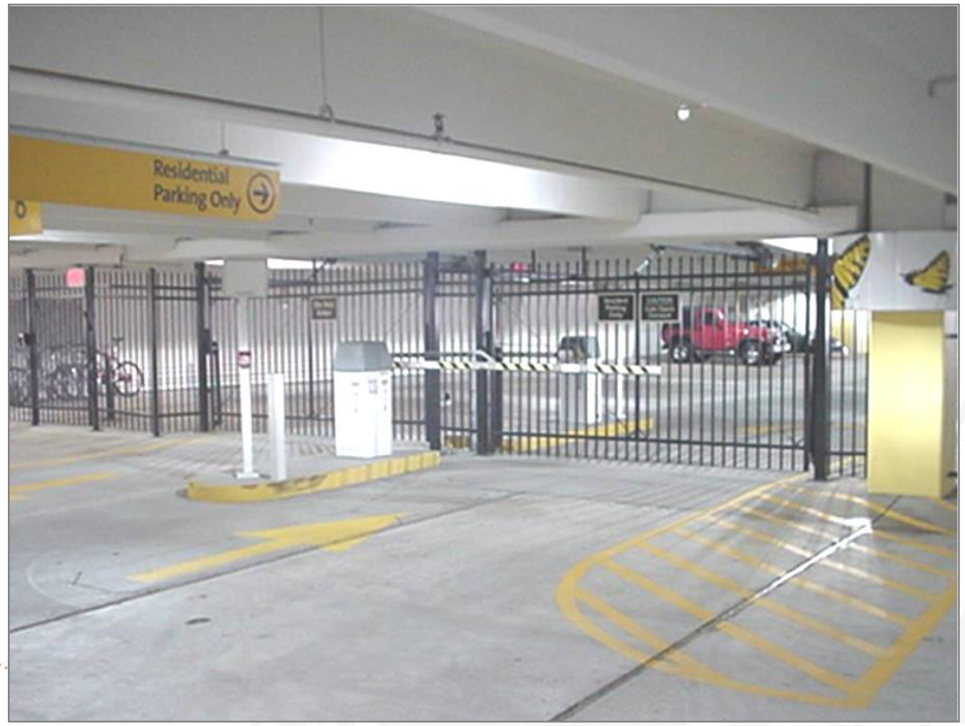
UNITED COATINGS
Technical Data & Application Instructions
7 PIGMENTED WATER-REPELLENT STAIN

ex.

- Except from Paint/Stain Specification:
- Provide paint system consisting of two coats of a (white) water-base penetrating stain in accordance with Manufacturers recommendations.
- Approved stain systems are as follows:
  - H & C Concrete Stain AC1W, Glidden
  - W-1, Okon Inc.
  - Canyon Tone Stain “W”, United Coatings
  - Aquastain, Tamms Industries Co.
  - Or Approved Equivalent

Nested Parking Areas

With the trend toward more mixed-uses in parking structures, the need to create segregated parking areas within garages is becoming more common. One effective tool in accomplishing this is through the use of “nested parking areas”.



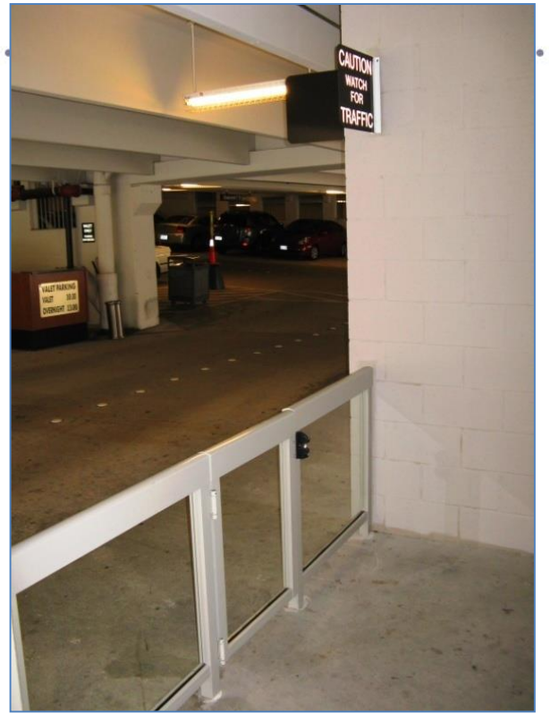
ex.

- The photo to the left shows a “secured and segregated” parking area for condo owners within a larger monthly parking structure used primarily by a large downtown technology center.
- In this case, separate AVI readers were installed and the readers programmed for residents.
- A separate pedestrian access gate and “California Style” swinging gates were installed to meet security requirements.

Parking Structure Pedestrian Safety

Areas that are adjacent to high volume traffic areas or entry/exit areas sometimes need special attention to protect pedestrians.

ex.



» The glass and metal gate system pictured here is one creative and effective option to consider.

Pedestrian Ways

In areas with high level of pedestrian traffic with parking garages, created protected pedestrian ways is a parking structure design best practice.

- Although this option adds cost, it is an extremely positive customer amenity and an effective safety enhancement.
- Care must be taken to ensure that ADA design parameters are taken into consideration.
- A 44” minimum is required if the access aisle is used as a “means of egress”, 36” if not.

ex.

Maximizing Parking Capacity

In some environments there are peak parking demand periods that will require special efforts to accommodate all your customers.

ex.

- At the Hotel Del Coronado, a special parking row behind the standard parking configuration allows them to add an additional 10% capacity to the normal self parking lot.
- During peak demand periods, they will shift to a valet stack operations mode.

Transitional Lighting

Transitional lighting (additional lighting provided at facility entrances) is both practical and an important safety feature in parking structures.

ex.

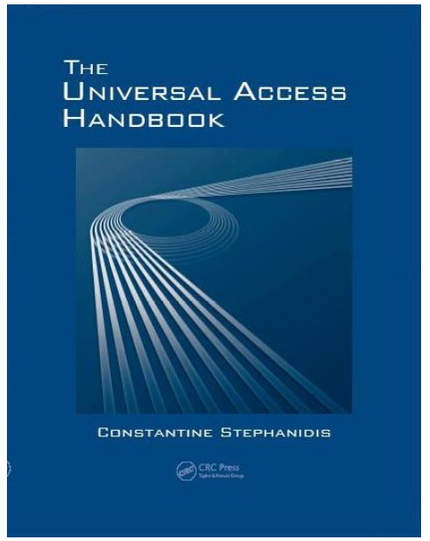
- The Illuminating Engineering Society of North America recommends a minimum of 50 foot candles for transitional lighting at parking facility entrances.
- Transitional lighting helps driver's eyes adjust from bright exterior conditions when entering the relatively dark conditions within a parking deck.

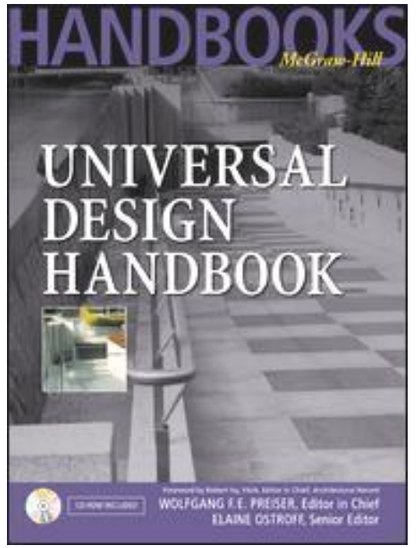
Universal Design

Universal design practices strive to eliminate accessibility issues through the incorporation of barrier free design strategies.

- Hands free parking through AVI systems is a non-traditional example of a universal design application.
- Other examples include, pay-by cell phone for on-street parking, audible cross-walk signals, voice activated elevator cabs, etc.

ex.





Parking Space Availability Signage

Single space monitoring systems with parking guidance signage make parking in large complex parking garages more user friendly.

These systems are being deployed in retail, airport, theme park and university environments.

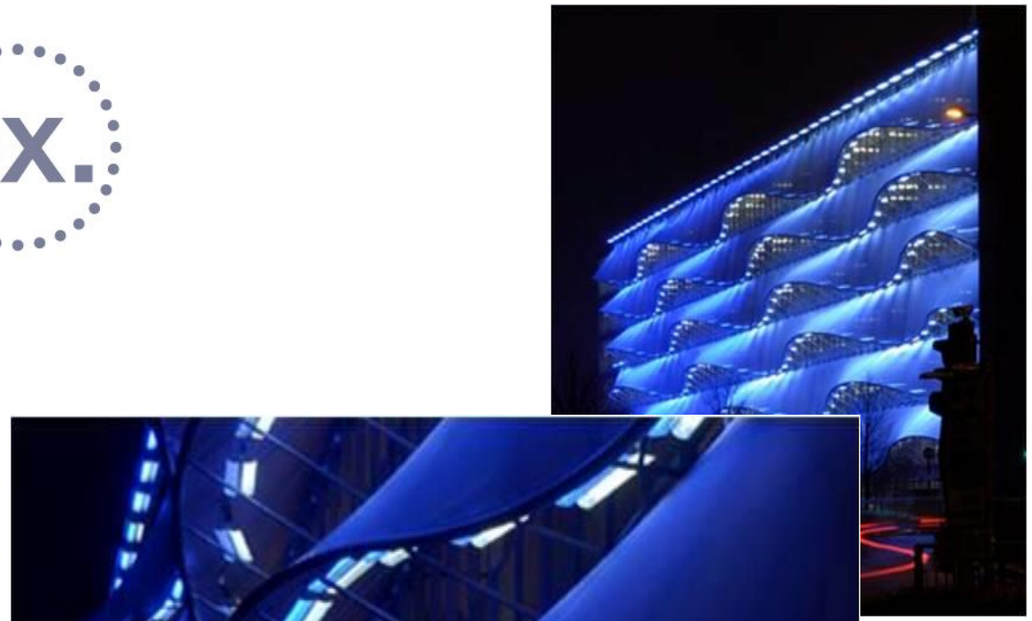
- Baltimore Washington and Seatac International Airports were among the pioneers of this technology.
- Westfield mall at Century City installed an advanced parking guidance system in their large 2000 space below grade garage.

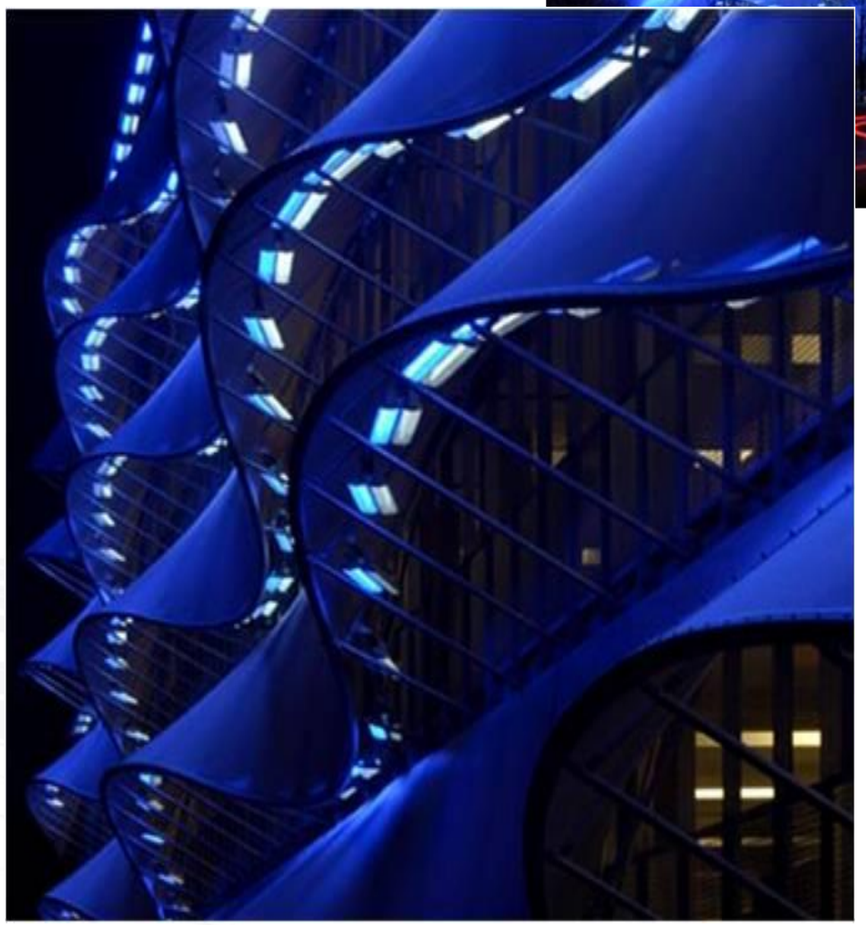
ex.

Creative External Architectural Treatments

To reinvigorate urban environments, some old parking garages are getting some interesting face-lifts!

ex.



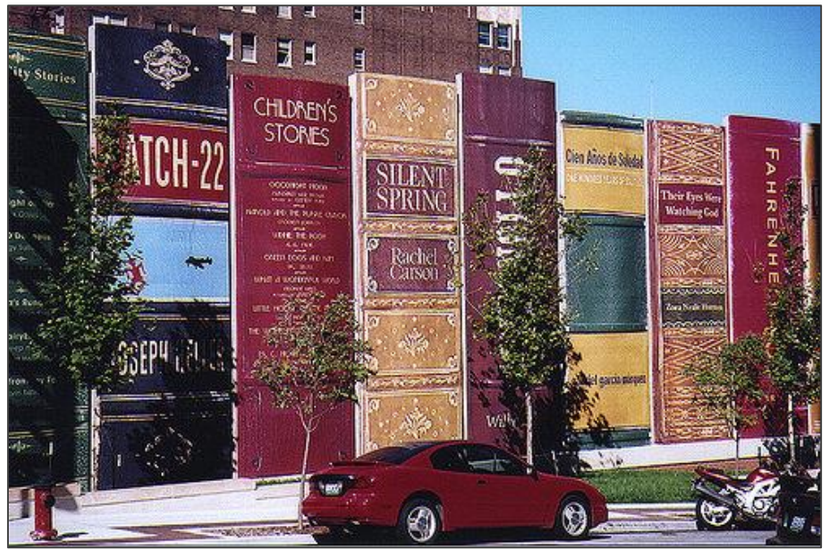


Creative External Architectural Treatments

ex.

This award winning design shows just how far some architects will go in adapting their design to nature of the larger project.

This “Library Parking Garage” in Kansa City won an IPI Award of Excellence”



Securing Ground Level

Restricting the number of access points is a parking facility design security best practice.

This photo shows that the goal of securing the ground floor can be done in an tasteful and attractive manner.

ex.

Alternative Garage "Skin Treatments"

One alternative to traditional pre-cast concrete panels are metal panels.

Potential Advantages Include:

- Greater openness
- Cost savings
- Attractive look

ex.

Ch.
30

Specialized Parking Facility Types

Consolidated Rental Car Facilities

Some of the largest, most advanced and well designed parking facilities in the country today are Consolidate Rental Car Facilities supporting major airports.

ex.

- These facilities are multi-modal hubs, many are integrated with light rail or monorail systems.
- These facilities often times show the true potential for parking facilities “interior environment enhancements” as illustrated in the photo below.

Specialized Canopy Structures

While technically not a parking facility, the Helios House in LA is a great example of creative architectural treatments for canopies covering automobile related uses.

ex.

» This structure's visually arresting geometric construct is largely maintenance free non-rusting aluminum alloy.

Intermodal Parking and Transportation Facilities

These facilities are typically hubs for multiple forms of transportation including rail, bus, taxi and parking. By centralizing these services to one location, passengers are able to access their preferred means of transportation more easily. Passenger comfort and safety is also with the construction of an interior lobby and designated pick-up/drop-off areas out of the way of traffic.

ex.

» In addition, businesses located near these facilities are more visible and accessible to customers. This facility will also help make downtown more pedestrian-friendly and increase foot traffic to local businesses.

Airport Parking Garages

While airport parking garages come in many forms, there are some basic design criteria that tend to show up in airport parking facilities due to their basic functional needs.

» Some of these features include”

- Helical ramps to move large volumes of vehicles in short periods of time.
- A predominance of flat –floors to better serve customers with luggage.
- Large facilities requiring good wayfinding.
- Integration of light wells or other features to break up large facilities and provide orientation.
- External exit toll plazas
- Integrated multi-modal transportation elements
- Advanced access and revenue control systems

ex.

Mixed-Use Facilities

What is a mixed use facility? Simply a building or group of buildings in which you can work, shop and live. The integration of parking either in a “wrapped”, “stacked” or below grade fashion (or some combination) is common.

ex.

- Of course you’ll still want to get away from time to time to visit friends, explore cultural venues and take vacations but for these a rental through a “car sharing” system might make more sense. Proximity to transit and the addition of community bicycle programs is increasing commute options.

Event Parking Facilities

Some parking facilities may be designed primarily for office parking, but with an awareness that they will be used for special events as well.

Event parking requires a another level of planning and design to accommodate the acceptance of up-front payment and peak egress traffic flow.

ex.

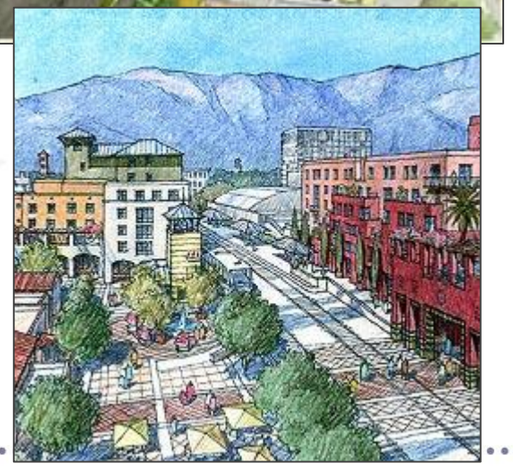
» Double-threaded helix circulation systems with separate up-bound and down-bound traffic patterns are common to expedite the high traffic volumes.

Transit Oriented Development Parking Facilities

The "new urban village" concepts designed around a rail/transit stop offers a picture of the emerging preferred urban development land-use type of the near future.

These “transit oriented developments” are characterized by relatively dense development patterns, strong permanent transportation elements that will support a “live/work/learn/play” environment.

ex. » While some parking is generally provided in tends to be less in overall numbers, provided in structures and supported by multiple transport options.



Temporary Parking Structures

There are temporary, modular, one deck car park systems designed to virtually double the capacity of an existing or new surface area, by use of a free-standing deck installed in the short amount of time with minimal site disruption.

Pre-fabricated elements are installed on the surface without traditionally excavated foundations.

The finished structure can be disassembled and 100% re-assembled on another site in different configurations.

In many cases installation can be phased to retain spaces for an ongoing parking operation and its revenue stream.

ex.

» For environments where major design decisions are in flux, or an immediate loss of existing parking needs to be mitigated this temporary modular parking deck option has distinct advantages.

the original modular system to double parking areas

Kimley»Horn

Ch.
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Automated Parking Facilities

High Density Vehicle Storage

There are products designed to meet higher-density parking requirements by providing more efficient space utilization through a variety of vehicle storage and retrieval options, from attended systems (valet) to fully automatic systems that require no human intervention.

ex.

» BENEFITS

- Designed or retrofitted in accordance with client specifications
- Cost-effective and can be installed with little to no site preparation; standard garage doors, facade siding and roofs can be used to enclose all systems
- Construction periods and costs are minimized - require no ramps or drive aisles
- Beneficial floor area ratio (FAR) – Systems regarded as one level in many cities

Mechanical Parking Structures – "Tray Systems"

Benefits of Automated Parking

- Automated Parking Saves Space
- Automated Parking systems allow vehicles to be stored without human intervention and allow for much greater vehicle density within a parking facility.
- By consuming roughly half the space of a conventional parking garage, automated parking brings value to real estate development projects in any of the following four ways:
  - » Saves Valuable Air Rights
  - » Reduces Expensive Excavation
  - » Fits More Cars
  - » Conserves Open Space

ex.

Unique Capabilities of the RoboticValet™

- » Robot lifts only the tray - nothing touches the vehicle
- » Rolls on solid concrete decks (new or retrofit)
- » Easy to maintain over long lifecycle
- » Moves underneath vehicles from any side
- » Transports vehicles in any direction
- » Rotates vehicles without a turntable
- » Lifts payloads up to ~7,000 lbs
- » Battery operated

BoomeRang Patent Pending PARKING SYSTEMS

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Parking and Economic Development

Develop a Parking Policy Geared to Support Economic Development

Some innovative parking programs that consider themselves as integral partners in overall downtown revitalization efforts have developed their overall parking policy framework to be geared toward support community and economic development.

Tempe, AZ is one such City. To the right is the overall policy framework they adopted.

ex.

Parking/Economic development Principles

- » Consider Parking as One Element of a Larger Transportation System
- » Effective Parking Resource Management
- » Define “Parking Adequacy” within the Transportation Context of Downtown
- » Create a “Proposed Development Parking Assessment Tool”
- » Maintain Shared Parking as a Core Parking Planning Element
- » Integrate Parking Planning Into the Larger “Downtown Business Strategy” Context
- » Long-Term - Build Toward a “Self-Supporting Parking Enterprise Program
- » Define a Specific Targeted “Return on Parking Investment Ratio”

Parking Benefit Districts

The establishment of "parking benefit districts" can serve as a financing tool to support improvements in downtown areas while also addressing traffic congestion and parking constraints.

Within a parking benefit district, public parking spaces (both on and off-street) are charged an hourly rate designed to keep approximately 15 percent of parking spaces vacant..

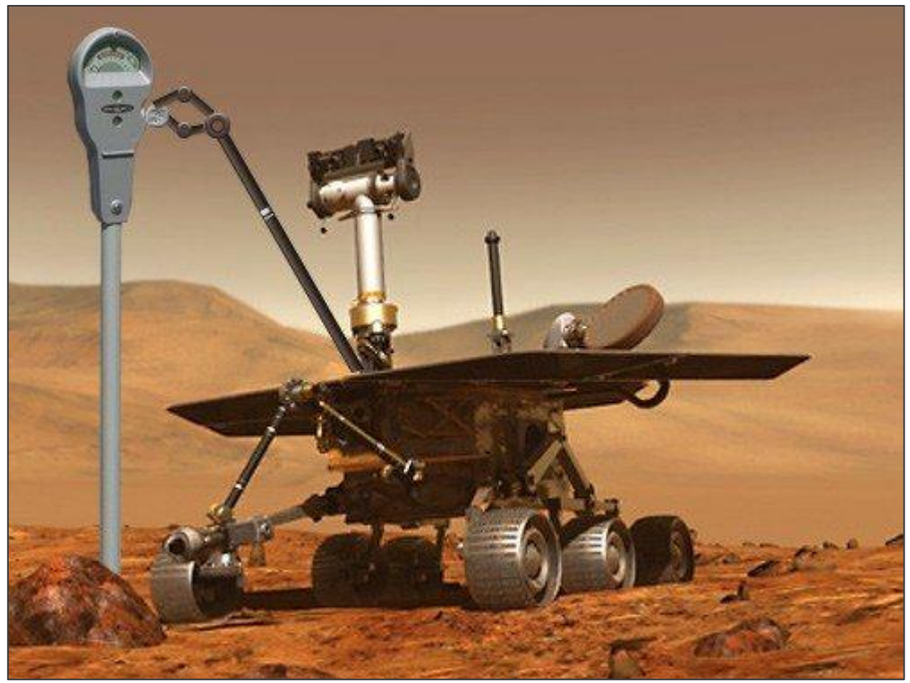
ex.

Other Key Parking District Attributes

- Funds collected from parking charges are poured directly into improvements that make the district more attractive, such as sidewalks, landscaping, and other amenities or aesthetic improvements.
- New parking meter technologies have improved customer convenience (customers can pay remotely by credit card or cell phone), increased pricing flexibility (rates can be changed in real-time based on location, time of day, day of week, or level of occupancy), reduced streetscape clutter, and reduced operating costs

Thank You!

Breaking News….



This just in….Congress has approved a new funding source for NASA.

Discussion

Appendix 12

White Paper: License Plate Recognition

License Plate Recognition

DATA COLLECTION

WHITE PAPER SERIES

May 2014

#2 vol.

Kimley»Horn
Expect More. Experience Better.

Park+
Unlimited Parking Solutions

Introduction

This is the second in a series of white papers intended to strengthen the Park+ User Group experience through enhanced education and application of modeling principles. This white paper discusses addressing ongoing data collection needs through the use of license plate recognition (LPR) technology. The Park+ model utilizes parking occupancy data as one of the primary calibration inputs. As such, the accuracy of the model depends on the ability to collect good parking occupancy data in the field. LPR technology provides a more streamlined and efficient approach in the field and also creates tabular data fields that can be input into the Park+ model easily.

History of the License Plate[1]

The use of license plates in America is older than the automobile. The first record of vehicular registration plates dates back to the 1850's, with horse drawn carriages in Philadelphia, PA requiring registration to be identified on the carriage in letters at least four inches high. The advent of the motor vehicle accelerated the use of license plates, with New York becoming the first state to require license numbers in 1901and Massachusetts becoming the first state to issue a standard statewide plate in 1903. Between that time and the 1950's, all states began to issue license plates and require a vehicular registration fee for operation on public roads; however, plate types and configurations varied widely from state to state. In 1956, license plates began to become standardized across jurisdictions, with standard plate sizes (12" x 6") dictated at the request of auto manufacturers.

In the 1930's, the license plate took on a secondary use, providing a retroreflective surface that was more easily identified at night. The first retroreflective license plate was issued in New Mexico in 1936, using glass beads embedded in the plates for retroreflectivity. The issuance became more widespread in the late 1940's, and these plates have long been endorsed by U.S. law enforcement office for improved safety through increased nighttime visibility.

Prior to World War II, most states required front and back license plates to improve the opportunity to read and identify plates from both sides of a vehicle. During the war, the practice was limited to one plate to conserve resources needed for manufacturing defense products.

TABLE 1 - STATES REQUIRING ONE LICENSE PLATE
Alabama
Arizona
Arkansas
Delaware
Florida
Georgia
Indiana
Kansas
Kentucky
Louisiana
Michigan
Mississippi
New Mexico
North Carolina
Oklahoma
Pennsylvania
South Carolina
Tennessee
West Virginia

After the war, most states returned to the dual license plate practice. However, many states are beginning to only require one plate to save manufacturing costs. Today, there are 19 states that do not require both a front and back license plate, identified in **Table 1.** Further advancements have evolved the license plate in the last 50 years, including:

- In the 1970's states began to introduce distinctive background graphics to depict their state's distinct landmarks or historical events. While attractive, they add another layer of complexity for law enforcement when trying to distinguish between jurisdictions.
- In the 1990's digital printing technology allowed manufacturers to move away from raised and embossed characters on plates and instead produce flat, digital-printed plates. These new printing processes have also increased the visibility of license plates, further distinguishing between the characters and the background graphics.
- In the near future, new technologies such as two dimensional bar codes can provide an even more legible and readable plate when combined with automated reading technology. These advancements could further enhance the readability and accuracy of both human-read and license plate recognition technologies.

These advancements in license plate technology have made it more efficient and effective to utilize license plate recognition technology to observation and record license plates. In the parking data collection realm, this provides a perfect platform to improve operations and efficiency for large areas of data collection.

[1] Best Practice Guide for Improving Automated License Plate Reader Effectiveness through Uniform License Plate Design and Manufacture" (July 2012). American Association of Motor Vehicle Administrators.

License Plate Recognition

The use of automated license plate reader systems is becoming increasingly popular throughout the world. Generally, the technology is known as license plate reader (LPR), automated license plate reader (ALPR), or automated number plate reader (ANPR), and the terms are fairly interchangeable. The technology uses image processing to identify vehicles through their license plates. Various industries, such as parking enforcement, access control systems, and law enforcement, have begun using the technology, with growth of the technology projected to be exponential over the next ten years.

A typical LPR system uses cameras to capture images of the front and/or rear of a vehicle. The images are sent through image processing software that analyzes the image and extracts license plate information (using the retroreflective properties of the license plate). In an enforcement setting, the system will use real-time database matching, which is helpful in scofflaw or stolen vehicle enforcement.

While the system seems simple enough, consistent challenges affect the accuracy of the system – jurisdictional license plate designs, varying fonts, graphic designs, cleanliness, coverings, and the presence of only one license plate to name a few. The inconsistencies can result in misreads, diminishing the effectiveness of enforcement efforts. In the data collection realm, these misreads can impact the accuracy of the data being collected. While the prevalence of misreads is unclear, some studies have shown misreads can be as high as 20%, which would severely impact the accuracy of data collection efforts.

Later in this document, we will explain how we overcome typical LPR misreads to improve data collection accuracy.

Two types of LPR units are typically available—mobile and stationary. For the purposes of this white paper, we will focus on mobile units. A mobile LPR is one that is mounted on a vehicle for the purposes of reading license plates over a large coverage area. A mobile LPR unit can include between one and four cameras, depending upon its purpose. Typical components of a mobile LPR unit include:

- Cameras for capturing images of plates
- Image processor, typically trunk mounted
- Mobile data terminal, typically mounted near the driver, which receives alerts registered from the processor

ALTERNATIVE USES FOR LPR

- Recovery of stolen vehicles
- Amber Alerts
- Open road tolling (pay by plate)
- Congestion charging
- Parking enforcement
- Access control
- Traffic studies
- Electronic vehicle registration
- Automatic speed enforcement
- Asset recovery
- Insurance fraud investigation
- On-street parking enforcement
- Travel or journey time calculations
- Security monitoring

Data from the processor can also be transmitted and/or stored in a back-office software application. The capture and transfer process typically follow these steps:

1. Detect the vehicle and license plate
2. Locate the license plate in the image
3. Extract license plate characters from the license plate background
4. Identify the license plate number
5. Determine the license plate jurisdiction
6. Transfer capture results to the back-end system

In the data collection process, these steps are performed, but only the detection of the vehicle and unique license plate are necessary for a valid observation of a parked vehicle.

When capturing images with the LPR cameras, there are typically two approaches. The first approach captures a single still image of the license plate using controlled illumination, lens settings, and field of view to optimize the read. This approach would be used to capture the best possible image of the offending plate. A second approach captures multiple images as the vehicle travels through the cameras field of view. This approach requires the system to perform adjustments to flash, shutter, and gain of the cameras, almost instantaneously as the vehicle moves.

Monochrome (black and white), color, and infrared cameras can be used, although black and white cameras tend to yield the best resolution and are generally the most cost effective. Color cameras separate characters from graphic backgrounds, which help to distinguish jurisdictions. Color cameras do not perform especially well at night due to their need for white light to produce accurate color information.

Potential Data Collection Applications

While LPR is most often used for enforcement purposes, Kimley-Horn saw an opportunity to introduce this technology in our parking studies practice (particularly Park+) as a means of automating collection efforts and improving overall accuracy and effectiveness. The remainder of this document will discuss our pilot study and subsequent investment in this technology, as well as typical data collection processes to consider as you begin to explore LPR data collection.

Prior to that discussion, here are a few data collection opportunities to consider using LPR

- **PARKING OCCUPANCY –** Use the images and information captured in the typical LPR collection process to compare number of plate reads against facility capacity to understand overall utilization.
- **PARKING DURATION/TURNOVER –** Compare license plate reads from the LPR unit against subsequent reads of the same block face or facility to understand overall parking duration. This effort will require short duration trips through a defined circuit. Many studies capture turnover or duration in increments as small as 15 minutes and as long as one hour.
- **PARKING FREQUENCY –** Use stationary LPR units to capture the frequency with which a vehicle enters a parking facility. This can be especially effective in situations where vehicles will enter and leave a facility to take advantage of free time periods (e.g., First Hour Free) by leaving and returning.
- **TRAFFIC COUNTS –** Use stationary LPR units to capture license plate information to count the number of vehicles at an intersection or on a segment of roadway.
- **ORIGIN/DESTINATION –** Use the registration information from license plates captured through stationary LPR units along a segment to understand drivers' origin points and destinations.

LPR vs Traditional Data Collection Methods

Traditional data collection methods require multiple data collection analysts in the field, either on foot or in a vehicle, manually counting and recording vehicular occupancy in a parking facility. LPR data collection allows for a more streamlined approach, typically reducing field staff required since the collection efforts become automated through roof-mounted cameras. The analysis of data is also streamlined, since the cameras offload the data into a reporting structure that allows for quick calculation of parking occupancy data, rather than returning to the office to catalogue hand-tabulated facility counts. The removal of hand tabulation inherently increases accuracy as it eliminates misreads of hand-written data. Calculating parking occupancies with the traditional method is largely manual, which increases human error and requires a more extensive review of data to ensure accuracy, increasing the hours spent analyzing and reviewing the data.

AutoVu Sharp X LPR camera

Kimley-Horn's LPR Technology

In the fall of 2013, Kimley-Horn pilot-tested and purchased AutoVu SharpX LPR cameras (and the associated LPR processing unit) to evaluate the system's potential to improve traditional data collection methods. After a successful pilot testing effort, Kimley-Horn purchased the LPR system and has used the system to collect parking occupancy data for several projects throughout the U.S.

The LPR equipment Kimley-Horn utilized to conduct data collection includes:

- Two mobile LPR cameras
- Trunk port that acts as a server and processing unit for the system
- A GPS tracker that identifies location of plate reads by address and XY coordinates
- In-unit laptop/tablet containing the following programs:
  - Patroller software
  - Security Desk software

The AutoVu Sharp X LPR cameras are positioned at a 45 degree angle to collect the varying heights and positions of license plates and for parallel and 90 degree parking.

• LPR Pilot Study

The 2013 pilot study focused on testing the use of LPR to increase efficiency and accuracy in parking data collection efforts. This evaluation was largely initiated out of the need for higher-quality data collection practices and standards for the Park+ practice. In addition, the LPR system streamlined the data collection process by reducing labor and time associated with the collection and processing of data.

Testing was conducted across two different settings. The first tested the limits of the LPR system across a variety of different "problem scenarios." The second tested accuracy in a variety of actual data collection settings. All tests were conducted by multiple Kimley-Horn employees to provide parallel manual data collection efforts, observe driving tendencies, and provide additional input on troubleshooting efforts.

The first testing types – those intended to measure problematic areas – were conducted on a small scale, typically in a handful of surface parking lots that provided a variety of lighting, access, and parking configurations. These tests were intended to evaluate the abilities of the LPR system against potentially adverse field collection scenarios. Testable factors included measuring "read accuracy" against:

- Angled parking
- Perpendicular parking
- Poorly lit garages
- Tight travel lanes
- Wide travel lanes
- Peak afternoon sun
- Shaded parking
- Variations in plate types and designs
- Driving speeds

These tests were conducted in Phoenix, Arizona. The initial test results were favorable and indicated that the equipment would perform well against the tested conditions. The predominant "misread" was found in newer plate variations and with backed-in vehicles, since Arizona does not require a front license plate. The following section presents initial findings and corresponding troubleshooting methods used in the initial data collection testing. Some of these troubleshooting elements were tested both in the initial "problem solving" phase and the subsequent field data collection testing period.

• Initial Experiences in the Field

The initial "problem testing" of the LPR system in the field provided a few observations on the LPR system's capabilities to retrieve accurate data for facility parking counts. Each of these potential pitfalls were met with troubleshooting attempts.

BACKED-IN VEHICLES – The most notable contributor that affected accuracy rates involved the presence of backed-in vehicles. In Arizona, no front plate is required, which caused an instant misread as the LPR unit is unable to capture any type of read from these vehicles. During testing, manual counts were compared against the counts of the LPR unit to evaluate the impact of backed in vehicles on vehicle count accuracy. The initial results of the data collection were less than ideal, with misreads ranging from 18 to 43 percent of vehicles in a facility, with the overwhelming majority occurring due to backed-in vehicles (discussed in greater detail in the following sections).

TROUBLESHOOTING ATTEMPT –
In an effort to offset the presence of backed-in vehicles, the data collection team created a process to manually count backed-in vehicles using a handheld counter. At the end of the collection process, these manually counted reads were added to the actual reads by the LPR unit and then compared to the full manual count. The hand-counted method resulted in a much more accurate reading.

NEW AND VANITY PLATE DESIGNS – During initial testing, it was observed that the cameras were unable to read newer, redesigned plates including new custom variations of Arizona plates. Based on this observation, it was determined that plates not included in the existing LPR database could impede accurate parking counts. Also, the system had difficulty capturing vanity plates, especially when traveling at an average speed of about 10 miles per hour.

TROUBLESHOOTING ATTEMPT –
Some, but not all, of these new and vanity plates were more easily read when traveling at a much lower speed. However, this low speed may not be ideal for efficient data collection. Although we were unable to account for license plate designs that are not entered into the system (i.e., the new Arizona Golden Rule plate), the LPR program allows for users to "manually capture" license plates that cameras are unable to read. This "manual capture" could be used on vanity plates, new plate designs, and obstructed plates. Additionally, this manual capture allows users to send new plate images to the system vendor, who may add this new plate into the system for future collection efforts.

LACK OF PLATE RETROREFLECTIVITY –
Throughout testing, it was observed that certain licenses plates had a form of film covering them. Some were installed purposefully as part of the license plate covering, while others were from the plate being dirty, or in some cases, being essentially disintegrated (this was most prevalent in Arizona, which faces harsh weather conditions in the summer months). It turns out that Arizona license plates come in two types, where one has raised and embossed characters and the other plate has flat digital printed characters. The embossing on the raised plates was found to most be the most likely to disintegrate, due to the Arizona sun. This strange phenomenon removed all retroreflectivity from the plate and prevented the license plate from being read by the LPR cameras.

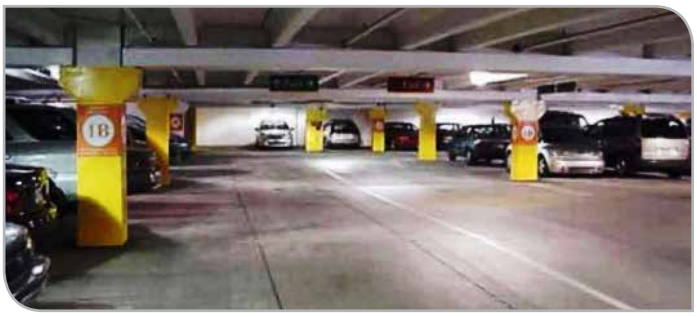
TROUBLESHOOTING ATTEMPT –
When a disintegrated Arizona plate was not captured by the cameras, attempts were made to see if lowering speeds would allow time for cameras to capture the image. In some cases, the additional time for obstructed plates allowed the cameras to capture the parked vehicle. In most cases, though, all retroreflectivity of the plate had been removed, which the system could not account for.

SUN – Glare from the sun caused misreads, especially when reflecting off metallic or other similarly shiny license plate coverings. However, this phenomenon was very rarely observed.

GEOPOSITIONING IN GARAGES – During testing, it was determined that the mobile GPS unit, which is used to track positioning of the images, could not project accurate coordinates for counts within a garage because the structure blocks the satellite connection with the unit. The results mapped garage reads anywhere from 1 foot to 1 mile away from their actual read location.

TROUBLESHOOTING ATTEMPT –
Not much can be done to improve the accuracy of GPS in garages, considering the enclosed nature of the facilities. Although disadvantageous, GPS coordinates are not absolutely critical in calculating parking occupancy counts because offload times can be used as an identifier in the collection and data analysis processes.

TURN RADIUS – When driving through a parking facility, turning radii and corner configuration of travel lanes are a potential misread point for capturing parked vehicles. When leaving one aisle and turning down another, the camera is unable to capture vehicles on the inner corner of the turn as they are too close to the vehicle and are outside of the LPR collection window.



TROUBLESHOOTING ATTEMPT –
Based on this observation, the most important step in capturing accurate data is the proper configuration of camera position and proper management of capture times. Proper configuration of the camera position is required to best capture the range in heights and positions of parked vehicle plates. This requires taking the time to calibrate, test, and recalibrate cameras until the cameras are in the most optimal position to capture plates. While the extra time needed to properly position and reposition cameras increases time spent in the field, the time proved to be beneficial as the data collected better reflected occupancies observed manually.

Managing capture times requires the user to use the pause and resume functions on the mobile computing system to set effective capture configurations. For example, three-bay garages will often require some single-side counts, which utilize only one camera, to capture a bay without double counting previous bays. The image above depicts a situation in which the right camera should be paused so that license plates in the passing aisles are not collected, as those vehicles would have already been collected when driving down that aisle. Recalibrating camera positioning and understanding when it is beneficial to use a single side of the camera system allowed data collection to reach optimal accuracy levels, rectifying most of the initial inaccuracy experienced in the field.

Although met with initial obstacles in reaching ideal accuracy rates in parking occupancy rates, the troubleshooting processes improved overall accuracy and efficiency in data collection, supporting the belief that the LPR system provides a greater benefit to the data collection process when compared to traditional collection methods. The results were sufficiently favorable for us to proceed to the second phase of testing – actual field data collection within a large area. The results of the field data collection tests are detailed in the following section.

• Field Data Collection Tests

To simulate settings that would be experienced during actual parking data collection, employees went into the field for three to five hours to capture parking occupancy rates in surface lots, garages, and on-street settings. These tests were conducted within surface lots and parking garages in a number of different locations including Tempe, AZ; Fort Collins, CO; Houston, TX; and Beverly Hills, CA. The first two sites were used to test the accuracy of the system. The second two sites were used to test the transferability of the system, including ease of remote calibration and ease of training additional users in the field.

For the test which evaluated the accuracy of the system manual counts and LPR counts were collected in parallel to identify disparities between the two data sets. These disparities indicate limitations in the LPR collection capabilities. The first series of accuracy tests were conducted on August 16 in Fort, Collins, Colorado, at the Colorado State University campus. The second series of tests were conducted on August 20 in Tempe, Arizona. The final series of accuracy tests were conducted on August 26, again in Tempe. The following tables detail the findings of each test.

TABLE 1 - STATES REQUIRING ONE LICENSE PLATE

FACILITY TYPE	MANUAL COUNT	LPR	% DIFFERENCE
Surface	86	72	16%
Surface	41	41	0%
Surface	27	20	26%
Surface	100	93	7%
On-Street	42	35	17%
Surface	201	172	14%
On-Street	21	22	5%
Garage	137	121	12%
Garage	151	123	19%
Surface	83	61	27%
Surface	83	75	10%
Surface	79	77	3%
Surface	73	69	5%
Garage	158	158	0%
Surface	173	162	6%
Surface	193	172	11%
Garage	146	138	5%
AVERAGE MISREAD % PER FACILITY			**10%**

The testing at Fort Collins was the first in-field data collection using the LPR data collection, and the results were mixed as to the overall accuracy of the system. While certain lots saw accuracy rates within five to ten percent of actual observed occupancies, the overall average misread was 10 percent. A closer look at the results indicates that the accuracy of the readings improved during the data collection, largely due to repositioning and recalibrating the equipment mid-collection. This proved to be one of the first effective lessons – camera position and calibration are critical to the success of the data collection efforts.

The **second test** was conducted for a series of surface parking lots and parking garages within Downtown Tempe, Arizona – a state that does not require front license plates. For this test, the data collection team performed a manual count parallel with the LPR counts for comparison. When comparing LPR and manual data in the field, the

difference between LPR and manual counts was high and unacceptable, indicating that the testing setup was not accurate enough to predict overall parking occupancy. It was realized that backed in vehicles severely impacted the collection of accurate parking, and was likely the biggest obstacle to accurate data gathering using the LPR system. On the final few facility passes, the data collection team attempted to manually count the backed in-vehicles after completing the overall count. The number of backed-in vehicles was almost exactly the delta between the LPR counts and manual counts.

The **third test** was conducted in Downtown Tempe, Arizona, within three parking garages and a number of surface lots, similar to those found in Test 2. One step that differs largely from Test 2 was that manual counts were conducted for backed-in vehicles, and the results were included with the automated LPR reads to better reflect the total number of vehicles in the facility. Similar to the previous tests, manual counts of all vehicles in the facility were collected for comparison purposes. The combination of LPR and manual counts for backed-in vehicles decreased misreads to a total of five percent of the manually counted total. In a few instances, LPR counts were greater than manual counts, such as in the City Hall Garage Test 3. This higher difference was a result of the LPR unit catching reflective objects, such as wall-mounted signs. Even with these misreads, the low percentage that impacts the overall accuracy of the facility is normalized among the greater data collection efforts, and the data collection team decided it was not a significant hindrance to overall accuracy of the system.

TEST 2 – TEMPE, ARIZONA – DOWNTOWN TEMPE

**It should be noted that Colorado requires both front and back license plates, which greatly improved the accuracy of the initial testing session.*

FACILITY	TEST	MANUAL COUNT EXCLUDING BACKED-IN VEHICLES	LPR	% DIFFERENCE
US Airways Garage	Test 1	1206	929	23%
	Test 2	1138	826	27%
Hayden Square	Test 1	172	101	41%
	Test 2	152	86	43%
City Hall Garage	Test 1	245	160	35%
	Test 2	217	145	33%
Brickyard Garage	Test 1	170	138	19%
	Test 2	159	101	36%
Surface Lots	Test 1	78	61	22%
	Test 2	54	42	22%
Centerpoint Garage	Test 1	733	468	36%
	Test 2	598	417	30%
Farmer Lot	Test 1	55	45	18%
	Test 2	51	40	22%
AVERAGE MISREAD % PER FACILITY				29%

TEST 3 – TEMPE, ARIZONA – DOWNTOWN TEMPE

FACILITY	TEST	MANUAL COUNT INCLUDING BACKED-IN VEHICLES	LPR	% DIFFERENCE
City Hall Garage	Test 1	239	229	4%
	Test 2	239	229	4%
	Test 3	216	219	1%
Centerpoint Garage	Test 1	674	611	9%
Brickyard Garage	Test 1	173	160	8%
Surface Lots	Test 1	254	258	2%
AVERAGE MISREAD % PER FACILITY				5%

After completing the detailed testing in Tempe, Arizona, the data collection team took the equipment on the road for testing in remote sites, primarily to test the ability to calibrate in the field on the fly, as well as train non-familiar users with the equipment. The first such test took place in Houston, Texas, in the Rice Village area. During this test, one Kimley-Horn employee and one City of Houston employee alternated the driving and collection positions to determine the variability in collection techniques. The testing also included a complete tear down and reassembly of LPR equipment in the field to determine any impacts to accuracy. Based on the recorded LPR counts and the observed data, the presence of misreads was between five and ten percent of total counts.

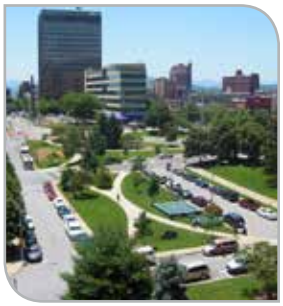
Similar tests were conducted in Beverly Hills, California. In these tests, Kimley-Horn employees performed brief training for city parking staff and then helped them assemble the LPR unit onto the enforcement vehicle. Under this test, on-street parking observations were evaluated. Through several phases or iterations of a predetermined route, the staff member was instructed to drive with one camera on, both cameras on, and alternating between cameras. The results were then transferred back to the Kimley-Horn office in Phoenix for review. The results indicated that the on-street routing with one camera was the most accurate and provided the best level of detail for parked vehicles on the curb side. When operating with both cameras, the camera on the traffic side of the vehicle recorded passing vehicles, which created disturbances in the counts and lowered the overall accuracy.

• Additional Field Data Collection Efforts

After completion of the pilot testing period and purchase of the equipment, Kimley-Horn has continued to use the LPR unit to enhance data collection techniques in communities throughout the country. Most of these efforts are in support of the Park+ modeling process, but some are simply to provide quality data to help strengthen parking planning processes. A few examples of these efforts include:

- **ATLANTA, GA –** LPR data collection was conducted over a three-day period in 37 surface lots and garages in Downtown Atlanta, amounting to 8,200 spaces. The results of the data collection effort and parking occupancy calculations provided a better understanding of parking demand in Downtown parking facilities.

- **ASHEVILLE, NC –** Parking counts were collected over a ten-hour period in 51 of Downtown Asheville's parking facilities, amounting to a total of 5,568 spaces. The parking occupancies calculated as a result of this data collection effort were utilized to update Asheville's Park+ model. The updated occupancy data included in the model better reflect the current parking demands of the Downtown area, which can then be utilized to inform management decisions regarding provision of parking.



- **TEMPE, AZ –** LPR data collection was conducted in Downtown Tempe to determine occupancy and identify parking demand in Downtown facilities. Data was collected in one day from 7:00AM to 5:00PM, surveying 12,756 spaces in 89 parking facilities. The occupancy data collected provided the basis for developing the Downtown Tempe Park+ model.

Data Collection Processes and Procedures

Now that we have covered the why and what of data collection using LPR, we would like to conclude with a brief primer on how to collect the data. Many of these elements are covered throughout the paper, but this section provides a typical work flow for conducting LPR data collection.

In general, the following steps should be considered when collected parking occupancy data with an LPR unit.

1. **PRE-PLAN DATA COLLECTION EFFORTS IN THE OFFICE –** Prior to going into the field, the data collector should determine the key elements of the collection process, including routing, collection time periods, facilities to count, and known facility capacities. If necessary, the collector should also prepare notifications of data collection, either pre-delivered or carried in the vehicle, to help interested parties understand the process and needs associated with the data collection efforts.
2. **SET UP EQUIPMENT –** If your system is like Kimley-Horn's, you will need to position cameras on the roof of the car and set up processing equipment. For most communities that use LPR units for enforcement efforts, this step can be skipped as the equipment will be permanently mounted on the vehicle.
3. **CALIBRATE –** Use the in-vehicle computing system to test the positioning of the cameras to ensure a proper mount. If needed, perform a small area test to determine the accuracy of the system. If the potential misreads are too high, reposition cameras for optimal license plate reads.
4. **PERFORM FACILITY-BY-FACILITY DATA COLLECTION –** Based on the predetermined routing and facilities to collect, the collector should begin data collection and follow the assigned route to ensure that timing of counts is comparable between hourly reads. After completing the counts within a facility, the collector should offload the LPR counts, which will send the reads from that facility back to the vendor's database for use in reporting. The collector should also manually document the offload timestamp, as well as manual counts of backed-in vehicles. Following this method, the collector should complete the daily cycle of data collection (based on predefined collection times).
5. Once the collector is back in the office, they should use the vendor's back-end system software to create reports that document offload time and plate reads. This combination of offload times and plate reads will be used to define facility occupancy for each cycle of data collection. Once the reports are created, they can be offloaded to a tabular format (e.g., .xls or .csv file formats), which will be input into a custom database that sorts and reads the offload times. The collector will need to manually input the documented offload times and facility capacities in the database. This is defined further in the following section.
6. Once the data is in the database, the collector can push the data through a pivot table that will provide the hourly occupancy counts for each facility.

These six steps represent the primary steps associated with the data collection. Following those steps should provide the collector with the basic framework for completing LPR data collection. However, based on our experiences in the field, we offer the following lessons learned to help strengthen each of the elements of the process, including Pre-Planning, In the Field, and Back at the Office.

PRE-PLANNING[2]

- Identify which facilities you are interested in collecting parking occupancy data for and for what period of time
- Determine the parking capacity for those facilities
- Create tables to use in the field that include the facility name and a placeholder to write down offload timestamps
- Print a spreadsheet for each hour of data collection
- Plan the most efficient route before collecting data at each facility. This includes determining the locations of any one-way streets and construction zones.
- Drive the route prior to conducting data collection to circumvent any additional obstacles not previously realized.

[2] It is assumed that users of the LPR system have a permanently mounted unit, rather than a mobile LPR unit that needs to be set up prior to each data collection effort

- Does the state in which you are collecting only require a rear license plate? In states that require only a rear license plate, it will be necessary to manually count vehicles that are backed into a parking space, typically using a handheld counter to do so.
- Would the study area environment require a letter from the city to enter some parking facilities? Although most parking facility employees are only curious about the LPR system, some prohibit vehicles with LPR cameras from entering due to preconceived notions of the system's purpose (i.e., enforcement or collection of private license plate data). It may be necessary to obtain a signed letter from the city to communicate that our only purpose is to collect parking occupancy information.

IN THE FIELD

- Carefully drive through the facility, making sure the vehicle is located in the center of the aisle to ensure all plates are captured
  - With 12' LPR cameras, the vehicle must be located in the center of the aisle to capture license plates on the right side of the vehicle.
- Maneuver through the aisles, turning the cameras on and off to ensure cars are not counted twice
- If a front license plate is not required where you are collecting data, manually count the backed-in vehicles using a handheld counter
- After exiting a facility, offload the information into the LPR software to determine how many "reads" or how many cars were in the facility at that time. Write down the offload time and the number of backed-in vehicles counted, if necessary.
- Repeat these steps for each facility for each hour of data collection.

BACK AT THE OFFICE

- Generate a report from the vendor's software for the applicable hours of data collection.
  - The report is generated in the form of an Excel spreadsheet that lists every license plate read for that period of data collection.
- Using a pivot table to mine the LPR data, the number of reads for each hour for each facility is added to identify how many vehicles were in each facility for each hour.
- The number of vehicles in a facility is divided by the facility's capacity, generating an occupancy percentage and displaying that information in a user-friendly format

GENERATE THE REPORT

Once the report is generated, Security Center displays the GPS coordinates of the "reads" on a map, which visually represent where data was collected and where reads or vehicles are concentrated. The points on the map are clickable, and once clicked, will display the image of the license plate, and characteristics of that specific read including when that plate was captured. The Security Desk software allows the user to draw a rectangle around a specific area, and regenerate a report to show the number of reads in that region alone. As a reminder, the accuracy of geospatial coordinate reads is typically compromised when generated inside a garage parking facility.

Reporting

After data collection is complete, the information is offloaded to Security Desk[3], the data management program that accompanies the LPR system. Security Desk creates reports of the reads captured during data collection. Reports can be generated for a specific date and time or by a general range of days (e.g., reads in the past 8 days). When the report is modified to meet the user's specific data, time, and place inputs, it can then be exported to an Excel file.

[3] LPR software and reporting capabilities may differ from that used by Kimley-Horn and therefore an evaluation of otherLPR software reporting processes may be necessary to identify the most appropriate data mining methods

The resulting Excel document is a robust spreadsheet that identifies information related to each read captured during data collection, including:

- Plate images
- Event timestamp (the time the plate was captured)
- Latitude and longitude coordinates of the read
- Offload timestamp (the time the data was sent to Security Desk)
- License plate numbers

	A	B	C	D	E	F	G	H
1	Plate image	Context image	Event timestamp	Manual capture	Latitude	Longitude	Offload timestamp	Plate read
2			10/8/2013 9:42:38 AM	False	0	0	10/8/2013 9:52:07 AM	BVN1244
3			10/8/2013 9:42:39 AM	False	0	0	10/8/2013 9:52:07 AM	958YRV
4			10/8/2013 9:42:40 AM	False	0	0	10/8/2013 9:52:07 AM	281TFS
5			10/8/2013 9:42:40 AM	False	0	0	10/8/2013 9:52:07 AM	KEC9068
6			10/8/2013 9:42:41 AM	False	0	0	10/8/2013 9:52:07 AM	BIP6363
7			10/8/2013 9:42:42 AM	False	0	0	10/8/2013 9:52:08 AM	8PWB102
8			10/8/2013 9:42:42 AM	False	0	0	10/8/2013 9:52:08 AM	AQ818A
9			10/8/2013 9:42:43 AM	False	0	0	10/8/2013 9:52:08 AM	8UJ636

Modifying the Reporting Process

The report created by the Security Desk software provides detailed information related to the license plate reads captured during data collection. The typical default reports do not provide much detail in relation to vehicular occupancy, as they are configured to provide information about the license plate reads observed during the collection process. However, after evaluating the reporting capability of the software program, Kimley-Horn determined that creating reports grouped by capture time or offload time will yield the best results, especially when compared to ingress and egress times from the observed parking facility. These reports are linked with a unique Microsoft Excel workbook that Kimley-Horn created specifically for the purpose of evaluating LPR offloads.

Offload timestamp	Facility
11/20/2013 8:56:56 AM	A8
11/20/2013 9:09:31 AM	B6
11/20/2013 9:26:10 AM	B8
11/20/2013 9:38:00 AM	B9
11/20/2013 9:39:39 AM	C1
11/20/2013 9:46:11 AM	D1
11/20/2013 10:01:51 AM	D2
11/20/2013 10:03:10 AM	E1
11/20/2013 10:07:18 AM	E2
11/20/2013 10:11:01 AM	E6
11/20/2013 10:13:23 AM	E7
11/20/2013 10:28:09 AM	COURT
11/20/2013 10:33:15 AM	G4
11/20/2013 10:50:51 AM	H3
11/20/2013 10:58:27 AM	I9
11/20/2013 11:04:09 AM	I14
11/20/2013 11:10:59 AM	I2
11/20/2013 11:12:44 AM	I2A
11/20/2013 11:15:54 AM	J3
11/20/2013 11:17:33 AM	J1
11/20/2013 9:57:41 AM	COURTHOUSE

For Kimley-Horn data collectors, the process for capturing accurate data reads includes using offload time stamps in the field to catalogue the entry and exit from each facility. The automated reads captured within each parking facility are offloaded immediately after exiting the facility. These offload timestamps are used to identify the groups of plate reads within that facility. All reads with the same offload timestamp are grouped and considered to represent the same facility.

Row Labels	Sum of Capacity
A1	29
A10	121
A11	15
A12	16
A2	25
A3	169
A4	16
A5	8
A6	15
A7	25
A8	85
A9	52
B1	42
B10	15
B11	50
B12	182
B13	20
B14	10
B15	15
B16	14
B17	44
B18	26
B19	178

A separate table was created on another sheet within the workbook to identify the capacity for each parking facility. These capacities are used to define the denominator in the parking occupancy calculation for each hour of data collection. The labels within this table correspond back to a designated naming convention for the parking facilities within the study area.

In the event that the location for collection is in one of the states that do not require both front and back license plates, another sheet provides a location for the data collector to input the manual counts from each facility observation. These manual counts would have been hand collected in the field and described by the facility location and the offload time.

The final step in the analysis process is to push the LPR counts through a pivot table that combines the manual counts and the capacities and sorts the data by hour to provide an hourly occupancy table. This hourly occupancy table provides measured occupancy levels for each individual facility during the day. Because our process was intended to provide an easily updatable data source for our Park+ model, the final output tables are set up to easily transfer to ArcGIS for joining and transferring data into the parking shapefile within a community's Park+ model.

% Cap	xc Event D	xc Event H								
	11/20/2013									
Facility	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM
B2	47%		72%		51%					89%	
B3	61%		60%			69%		54%		95%	
B4	44%		50%			50%		93%			
B6	28%		77%		71%			59%	48%		
B7	17%		53%		63%			40%			
B8	19%		48%			57%		50%		48%	
B9	43%					55%		50%		33%	
C1	35%		50%			50%		50%		19%	
C14	55%			59%		73%		68%		59%	
C18	6%					28%		11%			
C2	12%		25%			26%		19%		11%	
C2A	14%		29%			43%		29%		50%	
C4			20%			8%		16%		52%	
C5	21%					67%		58%		60%	
C6	50%					117%		100%		67%	
C7	37%			48%		59%		48%		27%	
County Deck		67%		59%			50%		35%	5%	
D1	37%			48%		58%		67%		48%	
D2	8%	21%		26%							29%
E1		50%		80%		70%			109%	98%	
E2		104%		84%		58%				81%	
E3		8%		36%		13%		19%		11%	
E4		49%		16%		9%		12%			
E6		49%		44%		44%		69%		64%	
E7		88%		84%		73%		71%		39%	
E8	23%			50%		46%			43%	42%	

Appendix 13

Recommended Maintenance Procedures

Recommended Maintenance Procedures

The recommended maintenance procedures listed in this appendix are based on direct ***Kimley-Horn and Associates, Inc.*** experience and the recommendations presented in the National Parking Association (NPA) Parking Garage Maintenance Manual. For ease of reference, the procedures have been divided into categories and are presented in the same order as used in the NPA Parking Garage Maintenance Manual.

7.01. Cleaning

Maintaining a clean facility is important because it affects the overall appearance of the structure, promotes a good reputation and increases the user's perception of safety. Likewise, poor housekeeping invites disregard for proper waste disposal and may indicate an increased tolerance for vandalism or abuse of the facility. It is our experience that the increased user satisfaction and facility reputation often offset the costs of keeping the facility clean. Generally, the membrane waterproofing, sealant, and expansion joint warranties require that the structure be maintained in a clean, safe and serviceable condition. As a result, we recommend that the maintenance program should include the following housekeeping and preventative maintenance items

Housekeeping Items:

1) Sweep weekly all parking floor areas

- One of the most frequently overlooked aspects of parking garage maintenance is proper floor cleaning. If not removed, debris will eventually end up in the floor drains and drain lines and cause slow or blocked drainage.

- Sweeping can be done either with hand brooms or sweeping machines designed for parking garage floor slabs. All sweeping equipment must first be reviewed "in action" to identify any sharp or rigid components which might contact the traffic bearing membrane or expansion joints and cause damage. Sweeping machines should also be reviewed for weight to be sure that it is less than the design live loads. Sweeping machines should be checked regularly to confirm that they are not causing damage.

2) Sweep or mop elevator lobbies, attendant booths, entrance and exit lanes, and elevators daily. Stairs should be cleaned daily and more frequently if they are heavily used.

- Stair and elevator lobbies are highly visible areas and will experience high volumes of patron foot traffic. These areas should be maintained in a clean and safe condition at all times.

3) Periodically sweep or wash out expansion joints and joint sealants.

- Debris and dirt accumulation within expansion joint and/or joint sealant recesses can hasten deterioration of the joint systems.
- Stones, glass, and miscellaneous debris trapped against the expansion joint or joint sealant may puncture the gland/sealant during repeated pounding from tires and the continued expansion and contraction of the gland with seasonal structural movement.

4) Windows in attendant booths should be washed daily. Other windows in the stairways, elevator cabs, and elevator shafts should be cleaned once a month to once a quarter, depending on their conditions and accessibility.

5) Stair enclosures, doors, and frames should be cleaned monthly. The elevator floors and walls should be cleaned monthly.

6) Trash receptacles should be emptied daily:

- Clearly marked trash receptacles should be placed at areas of pedestrian traffic flow such as the stair and elevator lobbies, etc. The absence of trash receptacles, or poor maintenance and collection of trash will tend to encourage littering.

7) Floor drains should be cleaned out weekly.

- Debris can buildup in floor drains and drainpipes causing slow or blocked drainage. Ponding water, which will occur with blocked drains, creates a slip hazard and can affect the durability of the concrete.

8) Grease and oil spots that build up in parking stalls, drive lanes and entry/exit locations should be cleaned at least twice a year. Large spots should be cleaned immediately and other spots should be cleaned as soon as significant “build up” occurs.

9) Signs should be cleaned with a mild detergent semi-annually to maintain appearance and visibility of the signs.

10) Parking control equipment should be cleaned weekly.

Preventative Maintenance Items:

1) Semi-annual wash down of the floor slabs and lower vertical surfaces of walls and columns with high volume low-pressure water source such as a fire hose.

- Preceded by sweeping, a wash down of the garage will help clean the deck of debris.
- Before and after washing floors, all drains should be checked to see that they are functioning properly. Sand washed off floors can clog drains. Temporary burlap filters may be used to prevent sand from entering drains, but must be removed immediately after washing.
- A high-pressure, low volume water source (maximum 2,500 psi) may be used to remove spots the fire hose was unable to clean. This high-pressure method should first be reviewed to confirm that the high-pressure water would not cause damage to the traffic bearing membrane, stripes, sealants, expansion joints, or concrete, etc.
- After several months of vehicular traffic, the traffic striping will become less visible due to an accumulation of dirt and debris. Cleaning during the wash down should help to “brighten” the striping.

2) More frequent (monthly) washing should be considered at high traffic areas and at any areas where slower drainage is observed.

- During winter months washing can be performed whenever moderate temperatures occur.

3) The underside of each level should be reviewed during each wash down to identify any leaking through the slab system.

- Leak locations should be identified on plans and sealants repaired as necessary as soon as possible.

7.02. Doors and Hardware

1) **Lubricate all doors.** Lubrication of doors and related hardware should be performed according to manufacturer's recommendations or at least semi-annually.

Frequency: 6 months

Procedure: According to Manufacturer’s recommendations

Supplies: Lubricant and rags

2) **Check operation of all doors.** All door hardware should be reviewed to assure proper operation. When a malfunction is noted, it should be corrected immediately to maintain the safety and security of the garage.

Frequency: 6 months

Procedure: According to Manufacturer's recommendations

Supplies: Flashlight

3) **Checks doors for signs of corrosion.** Proper cleaning and painting of the doors is important to maintain an attractive entrance to the facility. Inspections should be scheduled to review all doors and hardware for signs of corrosion and damage.

Other preventative maintenance includes painting, which is addressed in Section 7.06.

Frequency: 6 months

Procedure: According to Manufacturer's recommendations

Supplies: Flashlight, wire brushes, rags, and paint supplies

7.03. Electrical Systems

1) **Inspect lights for proper operation.** A properly illuminated facility promotes safer travel within the facility and provides a more secure feeling among its users. Daily inspection of luminaries (complete lighting unit), lamps, lenses, emergency lights, ballasts, electrical conduit, light fixture attachment to structure, distribution panels, time controls, etc. should be scheduled to ensure adequate illumination within the facility at all times. Defective luminaries should be repaired or replaced immediately. A properly illuminated facility promotes safer travel within the facility and tends to instill a more secure feeling among users.

Frequency: Weekly

Procedure: According to Manufacturer's recommendations

Supplies: Ladder

2) **Clean and replace lights.** Uniformity of lighting is a very important safety concern in parking structures. Scheduled cleaning of lights including lenses and replacement of lamps should be set up to maximize the uniformity of the lighting systems. Lamps should be replaced in groups at the end of their average rated life (refer to lamp cut sheets and local lamp supplier for average rated life). Lamp manufacturer studies indicate that energy costs may be reduced if lamps are replaced in groups before they burnout.

Illumination reduction also occurs due to dirt and dust that accumulates both inside and outside of the light fixture. Annual cleaning of light fixtures is recommended in order to maintain adequate luminance. Replacement of the acrylic lenses may be necessary if "yellowing" of the plastic is reducing the light output

Frequency: Every 12 months

Procedure: According to Manufacturer's recommendations for replacement of lamps

Supplies: Tool kit, ladder, lamps, recommended lens cleaner, and rags

3) **Inspect electrical conduits and panel boxes.** Electrical conduits and distribution panels should be inspected monthly to determine if they are functioning properly. Any water leaking into the conduit or panel boxes must be noted and remedied promptly. Identify and repair the source of leaking water in such locations as cracks, joints, and floor openings. Weekly re-secure, as necessary, electrical conduit and electrical fixtures for proper mounting. Cleaning and repainting of metal items or replacement and repair to reduce leaking should be performed as needed.

Frequency: Weekly

Procedure: Visually inspect conduits and panel boxes

Supplies: Tool kit, ladder, waterproof sealant, and rags

7.04. Elevators (for Parking Structure #3)

1) **Check elevators for proper operation.**

Frequency: Daily

Procedure: Visually inspect conduits and panel boxes

Supplies: Tool kit

2) **Perform annual inspection of elevators.** Preventative maintenance and good housekeeping is essential for proper operation of elevators and associated equipment. Additionally, most elevator codes and local building codes require periodic safety and maintenance inspections. Since requirements vary with the type of equipment, we recommend that the University verify local requirements and review the service contract provided with the equipment installation. Specific maintenance requirements for each piece of equipment are described in the operation and warranty manuals provided by the equipment supplier. Copies of these should be kept with this manual for ease of reference.

Frequency: Every 12 months

Procedure: Contact installer & have annual inspection performed

Supplies: None

7.05. HVAC

HVAC systems in the cashier booth (PS-1) should be inspected monthly. Air conditioner filters should changed monthly.

Specific maintenance requirements for each piece of equipment are described in the operation and warranty manuals provided by the equipment supplier. Copies of these should be kept with this manual for ease of reference.

7.06. Painting

1) **Inspect painted surfaces for corrosion damage.** Maintenance of painting systems is necessary to preserve the facility appearance as well as protect the underlying metal from corrosion. Painted elements that are operations or safety related should be inspected monthly. Painted steel requiring maintenance and inspection includes hollow metal doors, mechanical lines, bollards, and miscellaneous metal.

Frequency: Monthly

Procedure: These surfaces should be inspected noting paint chipping and corrosion of the underlying metal. Rusting areas should be properly prepared by removing all rust down to

bare, near white metal followed by priming and painting. As a minimum, miscellaneous metals requiring painting or touch-up should be painted using a two-coat alkyd enamel system. Application preparation should include removing all dirt, oil, grease and other foreign matter followed by a prime coat and two coats of alkyd enamel paint (i.e. Glid-Guard Silicone-Alkyd Enamel, by Glidden).

Supplies: Paint, brushes, rollers, paint thinner (cleaner), rags, ladder, and wire brushes,

2) **Clean and restripe parking stalls.** In order to avoid confusion for parking facility users, restriping of parking stalls should be initiated when the existing stripes begin to fade and are difficult to see. What appear to be faded stripes may only be stripes covered with an accumulated film of dirt, oil and grease.

Frequency: Every 12 months

Procedure: Therefore, the maintenance staff should first wash down the striped areas using a mild detergent if necessary, prior to considering the repainting of stripes. This may be adequate to sufficiently brighten the existing stripes. When restriping is required, ”non-chlorinated rubber” paint should be used.

When painting over existing stripes, the existing paint should be thoroughly cleaned and prepared by removing all de-bonded paint prior to applying new paint. When changing the striping layout the existing stripes should be completely removed. Painting over the existing stripes with gray paint is not recommended because as the gray paint begins to fade the old strips will become visible and create confusion.

Supplies: Paint (as listed below), brushes, rollers, paint thinner (cleaner), rags, ladder, and wire brushes,

1. “Latex Traffic Paint, ” Glidden, Cleveland, OH.

a. No. 22685 Yellow
b. No. 22683 White
c. No. 20090 Blue

2. "Setfast Acrylic Latex Traffic Paint," Baltimore Paint and Chemical Co., Division of the Sherwin-Williams Company, Baltimore, MD.

a. No. TM225 Yellow
b. No. TM226 White
c. No.TM2133 Blue

7.07. Parking Control Equipment

To ensure proper function and minimize equipment down time, inspections and preventative maintenance should be performed on a regular basis. The parking control equipment consists of control software, loop detectors, card readers, mechanical gates, and revenue control equipment. The particulars of the parking control equipment are in the operations manual and maintenance manuals provided by the manufacturer. These operation manuals are provided and should be located near this manual for ease of reference. In addition to any specific recommendation provided by manufacturer, we recommend the following:

Procedure: The control software should be tested every 90 days.

The loop detectors should be tested every 90 days to verify that they are functioning properly.

The card reader optics should be cleaned once a month with a standard bar code cleaning card.

Each gate should be observed on a monthly basis to watch the motion of the gate arms. Any unusual motion should be noted and limit switches adjusted.

Any unusual noises should be noted and the parts lubricated with SAE #10 oil. Belts should be checked for tension and tightened to proper tension. In addition, each gate should have preventive maintenance performed by an authorized equipment supplier every 6 months.

The system computer should be kept dust free and away from excessive heat and cold.

Supplies: Tool kit, rags, oil,

7.08. Plumbing Systems

1) **Clean and flush drainage system.** The plumbing system design consists of floor drains, drain risers, and a dry fire protection standpipe. Floor drains and piping should be inspected monthly to assure proper drainage and the rapid disposal of water. Remove sediment from the piping and flush the drain system thoroughly in conjunction with the semi-annual floor slab wash down. During the wash down procedures, it is recommended that temporary filters, such as burlap, be installed over the drains to minimize debris and sediment collection in the drainage system.

Frequency: Floor drains and piping – monthly
Floor slab wash down – every 6 months

Procedure: Floor drains and piping should be inspected monthly to assure proper drainage and the rapid disposal of water. Remove sediment from the piping and flush the drain system thoroughly in conjunction with the semi-annual floor slab wash down. During the wash down procedures, it is recommended that temporary filters, such as burlap, be installed over the drains to minimize debris and sediment collection in the drainage system.

All piping and fittings should be checked for damage, leaks or corrosion. Damaged components should be immediately repaired or replaced upon discovery. Appropriate action should be initiated to correct or minimize any leaking observed. All corrosion damage should be promptly repaired to arrest the process before a larger scale problem develops.

Floor drain grates should be replaced as required to minimize the risk of a pedestrian tripping hazard.

Supplies: Hoses, flashlights, bristle push brooms, and burlap bags

2) **Inspect and drain standpipe system.** The dry fire protection standpipe system should be maintained in a condition to function properly at all times. Pipes, sleeves, and pipe hangers must be kept free of corrosion.

Frequency: Monthly

Procedure: Pipes, sleeves, and pipe hangers must be kept free of corrosion. These surfaces should be inspected noting

paint chipping and peeling. Areas should be properly prepared by removing loose paint followed by priming and painting. Application preparation should include removing all dirt, oil, grease and other foreign matter.

Supplies: Paint, brushes, rollers, paint thinner (cleaner), rags, ladder, and wire brushes,

7.09. Waterproofing

As indicated in Section 7.01, to maximize the service life of this structure, it is very important to minimize water penetrations into the structure. As a result, the waterproofing components require rigorous monitoring and maintenance. The waterproofing system design consists of traffic bearing membrane (over occupied spaces), penetrating surface sealer, control joint and cove sealants, and expansion joints. These components have a limited life span and will require periodic repair, reapplication and total replacement at the end of their service life. Lack of periodic maintenance may lead to premature deterioration of the concrete and embedded reinforcing steel and will increase future repair and maintenance costs. Water leaking through damaged waterproofing components can also damage vehicle paint finishes, light fixtures and electrical distribution systems, and in general be a nuisance to facility users and maintenance staff.

1) **Inspect traffic-bearing membrane (deck coating).** The primary function of this membrane is to prevent water leakage through the concrete in these areas.

Frequency: Monthly

Procedure: Monthly inspection of the traffic bearing membrane should be performed, noting cracks, tears, blistering, debonding, and worn or deteriorated areas. Isolated failures may lead to localized water leaking, increased chloride contamination, and a potential increase in subsequent corrosion induced concrete deterioration. Membrane failures associated with or leading to concrete deterioration should be repaired only after any concrete deterioration or corrosion damage is addressed and repaired. Membrane damage from wear, vandalism, or accidents will generally require only proper recoating. Recoating or reapplication must be performed only by a licensed applicator and the Manufacturer's recommendations for repairs or reapplication must be followed. The traffic bearing waterproofing membrane system is warranted for five years. Damage from vandalism or lack of maintenance will

generally not be covered under the warranty. Therefore, it is important to maintain the scheduled cleaning and maintenance program noted in Section 7.01.

It is recommended that all repairs be fully documented and recorded in a maintenance log.

Supplies: None required

2) **Test penetrating sealer for effectiveness.** The penetrating sealer has a limited effective life due to traffic wear, sun exposure, and internal concrete reactions. Generally, the sealer manufacturers recommend reapplication of the sealer every 3 to 7 years, however, we recommend sealer effectiveness testing prior to reapplication to minimize total long-term cost (may be possible to delay reapplication).

Frequency: 3 to 7 years

Procedure: To test for the effectiveness of the penetrating sealer the manufacturer of a testing laboratory should perform the test. If the sealer has lost its effectiveness, a waterproofing contractor should complete another application.

Supplies: None required

3) **Inspect and repair joint sealants.** Sealants have been installed at concrete construction joints, and horizontal/vertical concrete interfaces (coves).

Frequency: Monthly and every 6 months during wash downs

Procedure: Monthly inspections of the sealants should be performed to visually determine where and if any sealants have failed. Failed/damaged sealants should be repaired and checked with the deck wash down for leaks. If failed sealants are not repaired, then potentially expensive restoration may be required to preserve structural safety. Thus, if leaking is observed, the source of leaking should be identified and resealed as soon as possible. The contractor must replace all failed joints for a period of five years.

Supplies: None required

3) **Inspect and repair expansion joints.** All expansion joint glands should be inspected monthly for signs of leaking. Failed joint systems and subsequent leaking will cause contamination to the adjacent concrete and underlying cast-in-place members as well as a continuous nuisance to the facility users. Check individual product warranties for limitations. Damage from vandalism or neglect will not be warranted and therefore it is important to adhere to the cleaning and maintenance schedule as described in Section 7.01.

Frequency: Monthly and every 6 months during wash downs

Procedure: Monthly inspections of the expansion joints should be performed to visually determine where and if any expansion joints have failed. Failed/damaged expansion joints should be repaired and checked with the deck wash down for leaks. If failed expansion joints are not repaired, then potentially expensive restoration may be required to preserve structural safety. Thus, if leaking is observed, the source of leaking should be identified and resealed as soon as possible. The contractor must replace all failed joints for a period of five years.

Supplies: None required

7.10. Safety Checks

Safety checks include assuring the proper operation of the lighting and illuminated pedestrian exit signs.

1) **Inspect walkways, handrails, stairwells, and walking surfaces for hazards.** Pedestrian walk paths must be maintained to avoid trip hazards such as loose stair nosings, damaged expansion joints, deteriorated concrete surfaces, or debris. Handrails should also be checked to verify rigidity and ability to withstand handrail loading.

Refer to the NPA Maintenance Manual for a discussion on safety checks.

Frequency: Daily

Procedure: Pedestrian walk paths must be maintained to avoid trip hazards such as loose stair nosings, damaged expansion joints, deteriorated concrete surfaces, or debris. Handrails should also be checked to verify rigidity and ability to withstand handrail loading. The loose fittings should be tightened or repaired as necessary. Damaged expansion

joints or deteriorated concrete surfaces should be repaired according to the procedures recommended in this section.

Supplies: Tool kit

7.11. Security System

Security adds to the overall user perception of security in a structure and represents an additional liability for the owner if they are not functioning properly. Thus, it is critical that these systems are maintained and monitored during all hours of operation. If this cannot be done, it is our opinion that these systems should be removed from the structure.

The security systems in this structure include:

- Push for assistance intercoms (all structures).
- Security cameras (PS-6)
- Monitors and VCR's located in the security office (PS-6).

By having these systems the user assumes that the systems are operational and that there is someone monitoring their actions 24 hours a day. As a result we recommend that the systems be checked daily as part of a walk-through inspection, but no less often than weekly, to determine if the systems are functioning properly. Equipment should be maintained as described in the literature provided with the equipment.

Frequency: Daily

Procedure: The camera-housing lens should be cleaned off at least once a month to ensure a clear view.

The monitors and other camera control equipment should be kept as dust free as possible.

Each VCR should be sent in once a year for a complete reconditioning.

The tapes used in the VCR's should be rotated daily. New tapes should be purchased quarterly and the old tapes thrown away.

Supplies: Tool kit

7.12. Signs (Graphics)

The signs should be reviewed weekly for damage from corrosion or vandalism. Replacement, if necessary, should be performed immediately to avoid possible traffic flow problems. Also, signs placed on the top levels of the facilities (or in other areas facing the sun) should be inspected for sun damage annually.

Frequency: Weekly

Procedure: Signs should be washed periodically with a mild detergent to maintain appearance and visibility of the signs

Supplies: Tool kit, mild detergent, water, rags, ladder, and hoses

7.13. Structural Systems

Maintenance of the structural system is one of the most important goals of this maintenance manual. Monthly inspections of the slab system and annual inspection of the beams, columns, walls, etc., are important in order to locate, monitor and record cracking and water leakage observed and allow for immediate repairs that will reduce further deterioration. Maintaining the waterproofing system, including sealants, coatings, expansion joints, etc. (See Section 4.10) is crucial for reducing deterioration of the structural system.

1) **Perform inspections of slabs, beams, columns, and walls and make necessary repairs.**

Frequency: Monthly – slabs
Every 12 months – beams, columns, and walls

Procedure: Inspect slabs, beams, columns, and walls for cracks, spalls and water leakage. Repair deterioration after review and recommendation by qualified concrete restoration engineer.

If, for any reason, concrete repairs are to be made, **PRESTRESSING TENDONS ARE UNDER HIGH TENSILE STRESSES AND MAY RELEASE WITH EXPLOSIVE FORCE DURING CONCRETE REMOVAL.**

Supplies: Tool kit, flashlights, and ladder

NO drilling or installation of powder driven fasteners in beams or tees should be allowed prior to confirming that this operation will not damage the prestressing tendons or components.

7.14. Stair and Elevator Enclosures

The stair enclosures include steel framed stairs and glass curtain wall systems. Semi-annual cleaning of exterior frames and glazing should be performed as needed.

1) **Clean outside of stair and elevator enclosures and inspect for leakage.**

Frequency: Every 6 months

Procedure: Most dirt may be removed with a moderate pressure water rinse and a brush or sponge. A mild detergent may be added to aid in cleaning the frames. Thoroughly rinse after using any detergent. The handrails are painted steel. Refer to Section 7.06 for recommended maintenance of painted surfaces.

Leakage observed at caulked or gasketed glazing joints or at flashing joints should be repaired immediately. Broken panels should be replaced as soon as possible to maintain a safe passageway and minimize potential water damage to the structure or equipment.

Supplies: Tool kit, ladders, mild detergent, sponges, rags, buckets, and hoses

7.15. Masonry

Masonry is a durable construction material that, if properly designed and installed, requires little maintenance. Maintenance that may be required includes cleaning, tuckpointing or preventive measures such as sealing the masonry and/or joints.

1) **Clean masonry and inspect masonry for signs of distress and clean.**
Masonry should be inspected every six months for signs of distress such as bowing masonry, corrosion stains through mortar joints, failure of sealants, spalled or cracked masonry or excessive efflorescence. If these conditions are observed, the consultation of a masonry design professional is recommended.

Frequency: Every 6 months

Procedure: ***Cleaning***

Cleaning of stains on masonry is only necessary to maintain its original color and beauty. Stains may be due to paint, efflorescence, dirt, smoke, mildew, graffiti, etc. The most common cleaning solutions for masonry are the following :

- Proprietary Cleaning solutions - such as "SureKlean" by Prosoco, Inc., Kansas City, KS (913)281-2700 or masonry cleaning products by Diedrich Technologies, Inc., Milwaukee, WI (414)764-0058.
- Detergent Solutions - suggested solution of ½ cup trisodium phosphate and ½ cup laundry detergent in one gallon of clean water.
- Acid Solutions - suggested solution of 10% muriatic acid (9 parts clean water to 1 part acid).

Most masonry stains should be removed with either proprietary cleaning solutions or detergent solutions. These cleaners should be used in strict compliance with manufacturers instructions. Acid solutions are not recommended and should only be used for extremely tough stains and on old stained masonry. Acid washing should only be used with a maximum 10% of acid, as overuse of acid will weaken the mortar and discolor masonry units. Acid should never be used on limestone, marble, calcareous sandstone, glazed brick, architectural terra-cotta, polished granite, light colored brick or dark brown or black brick. Caution must be used with acid and proprietary cleaners to prevent damage to adjacent elements, plantings, and injury to personnel.

Methods used for cleaning masonry include bucket and brush hand cleaning and pressurized water (maximum of 700 psi). Sandblasting is not recommended for cleaning any type of masonry as the risk of damaging mortar joints and scarring brick surfaces is too great. When cleaning masonry it is very important to saturate the masonry surface with clean water before and after cleaning. This prevents the cleaning agent from being absorbed into the masonry thus keeping it at the surface where the cleaning is necessary. With all cleaning methods a small trial should

be completed to determine the affect on the masonry, i.e. effectiveness, color change etc.

EFFLORESCENCE - One of the most common stains on masonry in new construction is efflorescence. Efflorescence is typically white in color and is a deposit of water-soluble salts on the surface of masonry. Water-soluble salts are brought to the surface of masonry in solutions of water and deposited there by evaporation. The salts come from soluble salts in masonry units, in mortar or from penetration by rain or groundwater. Efflorescence is not at all detrimental to masonry, but only affects the aesthetics of the masonry. Moisture is the vehicle that brings the salts to the surface. In new masonry walls the moisture typically comes from water trapped in the brick materials and in the wall system from original construction. New buildings typically "bloom" with efflorescence for the first one or two years. If efflorescence continues beyond two years there is a source of moisture that needs to be identified and eliminated. This source of moisture may be through masonry joints, sealant joints, flashings etc.

Efflorescence is a relatively easily stain to remove. Over time rainwater will wash the efflorescence off the wall. Methods of removal include dry brushing or brushing with a stiff brush and clear water. Efflorescence stains that are more difficult can be removed with the use of a detergent solutions or proprietary cleaners as previously described. Efflorescence removal using wet methods should only be completed in warm dry weather since the added moisture will tend to bring more salts out of the wall.

Supplies: Tool kit, ladders, sponges, rags, buckets, cleaning, detergent, or acid solutions, and hoses

2) **Inspect and repair deteriorated tuckpointing.** The water penetration of masonry walls is most dependent on the condition of the mortar joints. Over time mortar will degrade due to atmospheric exposure. When mortar can be easily removed with a finger or with light pressure with a car key, tuckpointing of the mortar joints should be completed to maintain a water resistant wall. Excessive water penetration over time will lead to deterioration of the masonry units and corrosion of embedded metal materials.

Frequency: Every 6 months

Procedure: Inspect the mortar joints in the masonry and test the mortar for soundness with a small screwdriver. When soft areas are located, they should be visibly marked. The areas should be repaired by a masonry contractor.

Tuckpointing involves removal of deteriorated mortar to a minimum depth of ½". Repair mortar should match the color and strength of the existing mortar. With soft masonry materials such as soft brick, limestone etc. using a soft tuckpointing mortar is essential. Type N mortar is most commonly used in tuckpointing of masonry walls.

Supplies: Tool kit, keel or marking pens, and ladders

3) **Preventive Maintenance**

It is important to maintain joint sealants at construction joints and perimeters of masonry walls. Water penetration at these locations can lead to the deterioration of masonry materials, increased efflorescence, and the corrosion of steel support angles, masonry ties and supports.

Often it is recommended that masonry walls be sealed with a proprietary silicone, silane or siloxane type sealer to reduce water penetration. However, the sealing of masonry walls should not be completed without the consultation of a masonry professional as sealing masonry can at times cause more harm than good. For example, applying certain sealers to brick masonry that has efflorescence due to trapped moisture can result in the spalling of the face of the brick units. Crystallization of the salt deposited behind the sealer will result in spalling of the surface of the masonry. There is also a potential for moisture being trapped behind the sealer resulting in freeze/thaw damage to masonry units and mortar.

Numerous proprietary products are available for sealing masonry walls. Two suggested masonry sealers are “Hydrozo Clear Double 7" - water based by Degussa Corporation (Chemrex) (952) 496-6000 and “Aqua-Trete” by Huls America, Inc., (800) 828-0919. A trial area should be complete to determine if the sealer changes the color and appearance of the masonry.

4) **Remove graffiti from concrete and masonry surfaces.** Graffiti results from the application of paint, felt tipped marker, crayons, lipstick or other materials. Graffiti should be removed as soon as possible after it is observed.

Frequency: When needed

Procedure: Inspect area where graffiti is observed. If it is on a painted surface, consider mechanical removal, such as sand blasting or grinding and repainting. If it is on a masonry surface the cleaning method may depend on the type of graffiti medium used. Sand blasting, water blasting, and chemical cleaning are available. Sand and water blasting may damage the masonry surface, while chemical cleaners pose environmental problems and may not be effective. Presently there are over 500 products listed that purportedly prevent, discourage, or remove graffiti.

Blasting with baking soda and blasting with dry ice have been found to be effective and pose minimum damage to masonry and the environment.

It may take several attempts with different materials before the graffiti is removed from masonry. Local firms specializing in graffiti removal should be retained for removal.

Supplies: None required.

7.16. RECOMMENDED MAINTENANCE SCHEDULE

This section provides a recommended schedule of cleaning, inspection, and other maintenance activities. In general, the need for repairs will be determined during the inspection or maintenance phase. The following symbols are used to designate scheduled activity:

H Housekeeping - Housekeeping represents that work conducted by in-house staff consisting of basic cleaning, sweeping, wash downs, etc.

I Inspection - Inspections may be performed by properly instructed in-house staff. Periodic inspections are necessary to confirm proper operation of systems or components.

M Maintenance - Maintenance is usually performed by in-house staff, however, it may occasionally require an outside contractor. Maintenance represents tasks necessary to ensure proper operation of systems and components.

Appendix 13
Parking Facility Maintenance Manual

The recommended maintenance record form should be utilized by Parking Services maintenance staff or their designee to record periodic inspections, maintenance and repair.

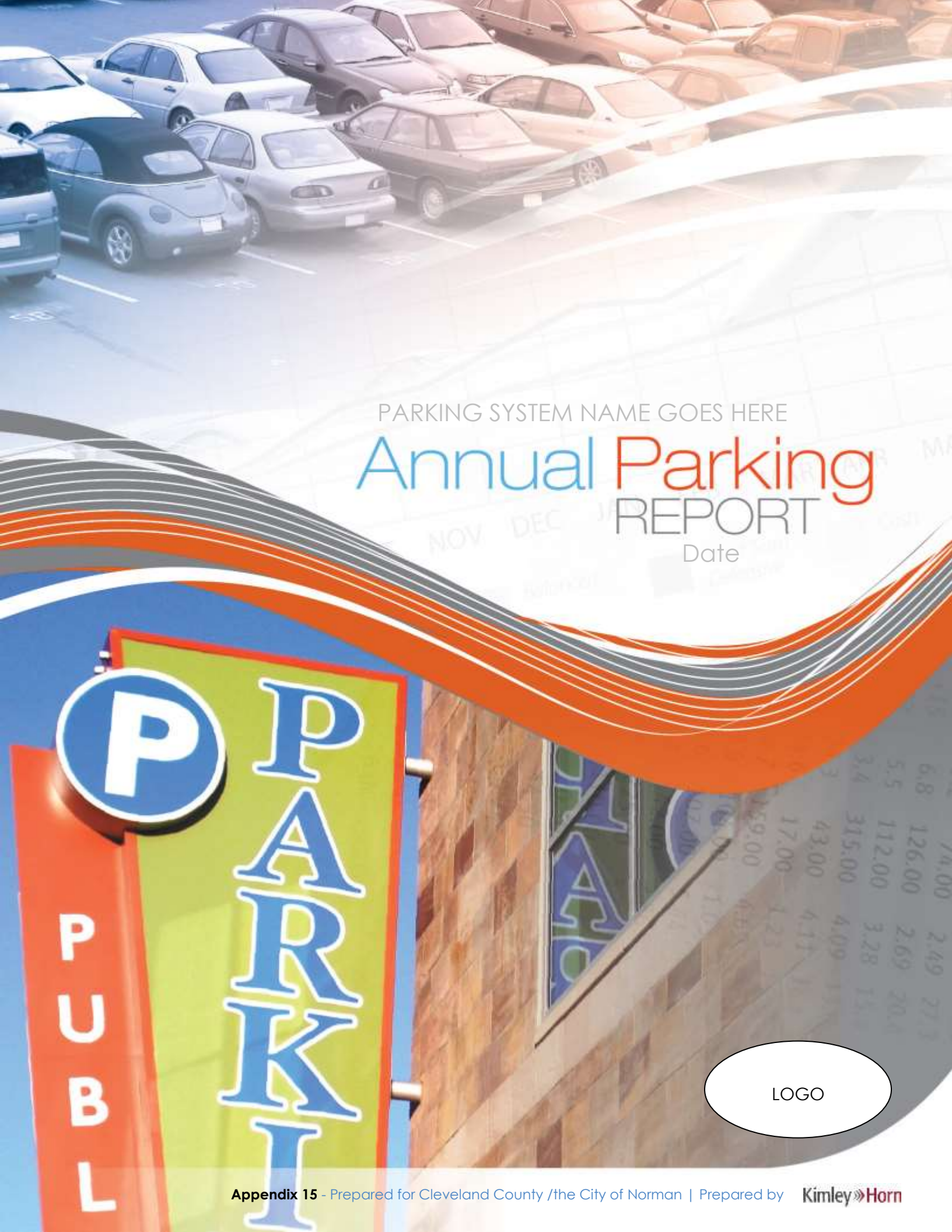
All repairs should be performed on an "as needed" basis.

Schedule 1 - Recommended Maintenance Schedule
Appendix 14

Work Item	Daily	Weekly	Monthly	Semi-Annual	Annual	As Needed	Maintenance Procedures	Equipment or Materials Used	Warranty Expiration	Installer	Comments
Cleaning											See Section 7.01
A. Sweeping											
1. Stair & Elev. Lobbies, Elev. Floors, etc.	H							Bristle Brooms, Etc.			
2. Floor Slabs, etc.		H						Sweeper			Inspect sweeper periodically to avoid damage to membrane.
B. Trash Collection											
1. Empty Trash Cans	H										
2. Floor Drains		H									Collect & remove debris from floor drains.
C. Slab Washdown				H							Coincide with ceiling survey to identify leaking joints.
D. Stair Enclosures - Frames, Doors, and Glass			H				Wash or wipe down				
E. Elevators - Floors & Walls			H				Wash or wipe down				
F. Signs				H		M	Clean w/ mild detergent				
G. Parking Control Equipment		H				M					
Doors and Hardware											
A. Check Operation				I							
B. Lubricate				M							
Electrical System											
A. Light Fixtures		I				M	Inspect individual fixtures				See Section 7.03
B. Light System		I				M	Inspect system for area blackouts, etc.				
Elevators						H,I,M					
HVAC						H,I,M					
Landscaping						H,I,M					
Painting											
A. Misc. Metal Doors, Piping, Handrails, Bollards, etc.			I			M	Review for paint chips and/or rust spots.				See Section 7.06
B. Concrete and Masonry Painting					I	M	Review for paint chips and peeling.				See Section 7.06
C. Parking Stripes					I	M	Review for fading, wear, and debonding.				See Section 7.06
Parking Control Equipment	I	H		M			Clean, lubricate, and confirm operation.				

Work Item	Daily	Weekly	Monthly	Semi-Annual	Annual	As Needed	Maintenance Procedures	Equipment or Materials Used	Warranty Expiration	Installer	Comments
Plumbing Systems											
A. Floor Drains			I,H			M	Remove debris buildup.				Perform drain cleanout in conjunction with floor washdown.
B. Floor Drain Lines			I			M	Check for leaks & damage.				Perform drain cleanout in conjunction with floor washdown, if necessary.
Waterproofing											
A. Penetrating Sealer											See Section 7.09 Review for reapplication every 3 to 7 years.
B. Crack & Joint Sealant			I,H		I	M	Review for leaks, adhesive or cohesive failures, tears, adjacent concrete or coating deterioration, snow-plow damage, etc. Repair Immediately				5-year warranty against leaking, wear, etc. See Section 7.09.
C. Expansion Joints			I			M	Review for leaks, adhesive or cohesive failures, tears, adjacent concrete or coating deterioration, snow-plow damage, etc. Repair Immediately				5-year warranty against leaking, wear, etc. See Section 7.09.
D. Roof Flashing			H		I	M	Review for paint chipping, peeling, fading, chalking, or other damage. Maintain sealants. Clean w/ mild detergents.				20-year warranty against chalking, fading, or color change.
E. Traffic Bearing Membrane			I,H			M	Review for wear, tears, cracks, blisters, snowplow damage, debonding, leaks, etc. Repair immediately.				5-year warranty against leaking, wear, etc. See Section 7.09.
Safety Checks	I					M					See Section 7.10.
Security Systems	I					M	Review for damage.				See Section 7.11.
Signs (Graphics)		I		H		M	Review for damage from vandalism, chipping, or flaking of paint. Review for sign & hardware damage.				See Section 7.12.

Work Item	Daily	Weekly	Monthly	Semi-Annual	Annual	As Needed	Maintenance Procedures	Equipment or Materials Used	Warranty Expiration	Installer	Comments
Structural System											
A. Columns, P/C Tees, P/C Spandrels, Walls					I	M	Review for leaking cracks, spalls, delaminations, etc. Repair immediately.				See Section 7.13.
B. Supportted Floor Slabs			I,H			M	Review for leaking cracks, spalls, delaminations, etc. Repair immediately.				See Section 7.13.
Stair Enclosures				I,H		M	Review for leaking joints, damage, etc. Repair immediately.				See Section 7.14
Masonry				I		M	Review for cracks, stains, damage, etc.				Perform cleaning and repairs as necessary. See Section 7.15.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    10. Leased
    11. Etc.
D. Accessible (ADA) Parking

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Appendix 16

Generic Parking Facility Rules and Regulations

Appendix 16

Generic Parking Facility Rules and Regulations

PARKING REGULATIONS
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This document is a guide to vehicle use in the _____ Parking Facility and traffic regulations are in accordance with _____ (State) ____ Law. Operation of a motor vehicle in the _____ Parking Facility is a privilege granted by the Owners /Operators.

ARTICLE 1. GENERAL

Section 1.1

Definitions as used in these rules and regulations, the following words, phrases, and definitions shall be interpreted as follows:

a. **Motor Vehicle**
Every kind and nature of vehicle propelled by motor by which any person or property may be transported.

b. **Pedestrian Safety Zone and Crosswalks**
That part of the facility set aside and suitably designed by signs or markings on the surface for use by pedestrians.

c. **Parking**
Includes stopping and standing of vehicles whether occupied or not, other than temporarily to take on or leave passengers, or while loading or unloading except stops in obedience to traffic signs, facility staff or a police officer.

d. **Employee**
When used herein "employee" means any person employed by _____. This term includes all staff, sub-contractors and administrative personnel.

e. **Contract Parker**
Any person or organization currently under contract with _____ for monthly access to the Gateway Village Parking Facility. To include bank associates, tenants and homeowners.

f. **Visitor**
Any person other than a contract parker of the facility temporarily operating or parking a motor vehicle within the facility. The term includes service personnel, vendors, and contractors that may occasionally access the _____ Parking Facility.

g. **Parking Access Card**
The device issued by _____ to contract parkers allowing gate controlled entrance and exit to the facility.

Section 1.2 Authorizations

1. _____, _____ Properties and the _____ are the principle advisory bodies for the _____ Parking Facility and are authorized to recommend, request and implement policies and regulations governing parking operations in the _____ Parking Facility.

2. The ___ (Municipality) ___ Police Department is authorized to enforce ADA regulations while _____ may issue citations, tow or boot vehicles for all offenses committed in the Facility.

3. _____ has jurisdiction over parking violation appeals in the facility for contract and visitor parking. Homeowners and Tenants may appeal violations through the appropriate Homeowners Association. In those cases heard, the association will impose appropriate monetary and/or restrictive penalties.

Section 1.3 Responsibility of the Parking Operator

Even though the parking operator oversees surveillance and enforcement procedures 24 hours a day, _____, assumes no responsibility for any damage, theft, or loss of a motor vehicle or any personal property therein, when the vehicle is parked in or being operated on properties under management by _____.

Section 1. 4 Responsibility of Parkers

Parkers in the Gateway Village Parking Facility should lock their vehicles at all times and valuables should not remain inside the vehicle. Parkers are to park all vehicles in areas designated by E-Z Parking and are responsible for obeying all rules and regulations in effect pertaining to the use of the facility.

Section1-4 Vehicle Accidents
All motor vehicle accidents occurring in the facility should be reported immediately E-Z Parking and/or on-site security for documentation and investigation. Vehicles should not be moved from point of impact unless there is an immediate threat to life or property or it obstructs the regular flow of traffic within the facility.

ARTICLE 2. Registration of Contract Parking Motor Vehicles

Section 2.1 Procedural Requirements

1. Upon application for contract parking, all motor vehicles must be registered with _____., and be issued the appropriate parking access card. This includes additional parker vehicles that may be parked in the future.

2. Each contract parker should register his/her own vehicle.

3. Any person applying for contract parking must, upon request, present a valid __ (State) ___ or appropriate state vehicle registration certificate.
4. Persons holding current state disabled parking placards, tags or Disabled Veterans license plates will receive the standard parking access card and will pay the regular parking fees.

5. Replacement parking access cards will be issued for $25.00 if lost or stolen. Broken card will be replaced at no charge, provided they are returned to _____.

6. When the original parking access card is not returned or the aforementioned actions are not taken, the replacement fee will be the full fee in effect at the time of the replacement. This also applies to cards that are reported lost or stolen; a _____ Lost Card report must be filed.

Section 2.2 Displaying Parking Access Cards

1. Issued parking access cards are to be immediately affixed to the vehicle registered. Parking access cards must be placed inside on the left side of the front vehicle windshield.

2. Parking access cards are issued to a specific contract parker and may only be transferable to vehicles under their control.

Article 3. Regulations Governing the Operation of Motor Vehicles within the Facility

Section 3.1 Parking Regulations

1. Parking in the _____ Facility is restricted to individuals who have properly contracted parking with _____ and who display parking access cards, homeowner's, tenants, and visitors. All other vehicles will be considered illegally parked.

2. Certain parking spaces in the facility are designated "Reserved Parking" and are intended for the use for which they are reserved. These "Reserved Parking" spaces are marked by appropriate signs and times the reserved status is in effect.

3. Service areas are to be occupied only be service vehicles.

4. The following practices are specifically prohibited:
    - Double parking.
    - Parking so as to completely or partially obstruct two parking spaces. Every vehicle must be parked between the lines of a single space.
    - Parking on sidewalks, curbs, crosswalks, or other areas not specifically designated for parking.
    - Parking in driveways, blocking roadways, obstructing traffic, and blocking parked vehicles.
    - Parking in fire lanes, within ten (10) feet of fire hydrants, in loading zones, and in areas marked as "No Parking Zones".

5. It is the responsibility of the motor vehicle operator to find a legal parking space. Lack of convenient parking spaces is not considered a valid excuse for violations of any parking regulation.

6. The fact that a person may park or observe others parked in violation of the regulations without receiving a citation does not mean that the regulations are no longer in effect. Parking is permitted only in designated areas and only in accordance with posted signs.

7. The absence of a "No Parking" sign does not mean parking is permissible in an area.

8. Vehicles are not permitted in areas or spaces closed by use of cones or other traffic control devices.

9. The following offenses shall be ticketed as parking violations:

    a. Parking in a no parking zone or loading zone.
    b. Parking out of assigned nesting area beyond the appropriate grace period.
    c. Parking in a reserved space.
    d. Parking which blocks traffic.
    e. Unauthorized parking in a service area.
    f. Blocking disabled wheelchair space or ramp.

10. The following offenses shall be ticketed as vehicle registration violations:

    a. Failure to register vehicle.
    b. Use of a parking access card obtained through willful misrepresentation or falsehood.
    c. Failure to attach parking access card in accordance with instructions.

11. Only minor or emergency repairs may be made to vehicles parked in the _____ Parking Facility.

Section 3.2 Hours of Regulation

Except as noted herein, all parking regulations are in effect 24 hours a day, 7 days a week and all nested parking areas and reserved spaces are restricted to a specific user as designated by posted signs or curb markings.

Section 3.3 Towing and Immobilization

1. Vehicles are subject to immobilization if they have unpaid monthly contract balances, three or more citations or if an unauthorized, fraudulent parking access card.
2. Cost of release from immobilization is $95.00.
3. Release is available from the Parking Office Monday through Friday, 7:00 a.m. to 9:00 p.m. At all other times from facility on-site security.
4. Vehicles are subject to being towed from the facility at the operator's expense for any of the following reasons:
    a. The vehicle is parked in a hazardous manner: blocking traffic, crosswalks, sidewalks, and disabled ramps.
    b. The vehicle is parked in a space reserved.

c. Failure to arrange for the release of an immobilized vehicle within 48 hours of the immobilization.
d. The vehicle is abandoned within the facility.
e. When immobilization is not appropriate due to vehicular construction.
f. When documentation exists that the vehicle owner has previously removed an immobilization device without authorization.

5. _____ must be notified immediately of any inoperable or abandoned vehicle. Such vehicles unreported after 24 hours will be removed at the owner's expense, unless approval to remain has been granted by _____, local police or the Management Company.

Section 3.4 Regulations governing scooters, motorcycles, mopeds, and bicycles

Motorcycles

1. Drivers are responsible for observing the same traffic regulations as those governing automobiles

2. All motorcycles, mopeds and scooters under monthly contract parked in the facility must be registered with _____. Parking access cards do not need to be displayed after parking vehicle.

3. Motorcycles, mopeds and scooters shall only be parked in valid spaces.

4. Parking motorcycles, mopeds and scooters on sidewalks or curbs is a violation.

5. Parking violation involving motorcycles, mopeds and scooters may result in the issuance of parking tickets, immobilization or impoundment of the vehicle.

Bicycles

1. Bicycle operators are responsible for observing the same traffic regulations as those governing automobiles at all times.
2. Bicycle parking is located throughout the facility and is designated by the presence of bicycle racks.
3. Bicycles shall not be parked or stored:
    a. Within or surrounding stairwells, hallways or designated disability accesses.
    b. Against or attached to any tree, bush or plant.
    c. Against or attached to any electrical fixture, signpost, railing, public seating fixture or emergency exit.

Bicycle Impoundment

1. Bicycles found in violation or parking rules may be impounded without prior notification.

Section 3.5 Other

Any person may assist in the enforcement of the _____ Parking Facility Rules and Regulations by reporting violations to _____ or the property manager at ###-#### or ###-####. Supporting information such as the auto manufacturer, year, color, license tag number or other identifying characteristics should be given.

Appendix 17

Sample Parking Garage Operations Manual

Note: This manual was developed by Dennis Burns for Cousin's Properties and is shared by permission.

Logo

Facility Name

Location

City, State

SAMPLE PARKING FACILITY OPERATIONS MANUAL

Date

Parking Facility Name
Sample Parking Facility Operations Manual
Date

Parking Facility Name
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Date

Parking Facility Name
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Date

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Date

Article I. Building Management

The Gateway Village located in the Central Business District of Charlotte, North Carolina is managed by Cousins Properties Incorporated. Owned by Charlotte Gateway Village, LLC, Gateway Village functions as a mixed-use office, retail and residential development consisting of approximately 1,000,000 square feet, with approximately 45,000 square feet of retail space.

E-Z Parking, Incorporated is a member of the Cousins Management Team and is responsible for providing a high level of efficient, effective and professional management for the Gateway Village Parking Facility. E-Z Parking works hand in hand with the Cousins Management Team to meet their objectives.

This Operations Plan in intended to function primarily as a handbook for E-Z Parking Staff to provide direction and guidance in the management of the Gateway Village parking facilities. Specific operational policies may be added, deleted or otherwise edited to provide the highest level of service while controlling the facility. Requests for changes are accepted from Cousins Properties, Bank of America Management members, Post Properties, The Boulevard Company, Boulevard Centro, residents and facility patrons. Requests are made to the parking facility manager and must be agreed upon by the management team prior to implementation.

The following directory shall be maintained and kept up to date at all times and be to the on-site management staff:

Parking Facility Name
Sample Parking Facility Operations Manual
Date

1.01 Cousins Properties Contact Listing

Name Title Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail: ______________________________
Name Title Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail: ______________________________
Name Title Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail: ______________________________
Name Title Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail: ______________________________
Name Title Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail: ______________________________

Name Title Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail: _____
Name Title Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail: _____
Name Security Director Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail:
Name Office Manager Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail:
Name Accounting Manager Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail:

1.02 The _____ Company Contact Listing

Name Title Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail: _____

Name Title Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail: _____
Name Title Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail: _____
Name Title Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail: _____

1.03 _____ Property Management Contact Listing

Name Title Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail: _____
Name Title Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail: _____

Parking Facility Name
Sample Parking Facility Operations Manual
Date

Name Title Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail: _____
Name Title Address Address Address	Direct: (___) ___-____ Main: (___) ___-____ Fax: (___) ___-____ E-Mail: _____

1.04 Parking Facility Statistics

Total Capacity	2,725 Spaces
Total Compact	464 Spaces (17%)
Total Full Size	2,222 Spaces
Total Handicapped Spaces	39 Spaces
Total Reserved Spaces	559 Spaces
Total Bank of America Spaces	2,166 Spaces
Total Boulevard Reserved Spaces	265 Spaces
Total Post Reserved Spaces	294 Spaces
Total Boulevard Nested Spaces	151 Spaces (75 level 4 & 76 level 5)
Total Post Nested Spaces	225 Spaces (135 level 3 & 90 level 6)
Total Retail Reserved Spaces	60 Spaces (Boulevard Controlled Spaces)
Total Visitor Spaces	N/A
Number of Elevator Cabs	8 Elevator Cabs (2 sets with 4 cabs each)
Number of Stairwells	4 Stairwells (1 located at each corner)
Number of Parking Levels	8 levels
Square feet of Facility	850,000 Square Feet
Number of Entrance Points	3 Entry Points
Total Entrance Lanes	6 Entrance Lanes (1 Reversible Lanes)
Total Transient Entrance Lanes	6 Transient Entrance Lanes (1 Reversible)
Total Monthly Entrance Lanes	6 Monthly Entrance Lanes (1 Reversible)
Number of Exit Points	3 Exit Points
Total Exit Lanes	5 Exit Lanes (1 Reversible Lane)
Total Transient Exit Lanes	2 Transient Exit Lanes
Total Monthly Exit Lanes	5 Monthly Exit Lanes

1.05 Hours of Operation and Staffing Plan

EMPLOYEE	MON	TUE	WED	THU	FRI	SAT/SUN
Manager	7:00-5:30	7:00-5:30	7:00-5:30	7:00-5:30	7:00-5:30	OFF
Bookkeeper	8:00-5:30	8:00-5:30	8:00-5:30	8:00-5:30	8:00-5:30	OFF
Supervisor	11:00-7:30	11:00-7:30	11:00-7:30	11:00-7:30	11:00-7:30	OFF
FT Cashier	7:00-3:30	7:00-3:30	7:00-3:30	7:00-3:30	7:00-3:30	OFF
FT Cashier	11:00-7:30	11:00-7:30	11:00-7:30	11:00-7:30	11:00-7:30	OFF
PT Cashier	4:00-9:00	4:00-9:00	4:00-9:00	4:00-9:00	4:00-9:00	OFF
FT Maintenance	6:00-2:30	6:00-2:30	6:00-2:30	6:00-2:30	6:00-2:30	OFF
FT Maintenance	12:30-9:00	12:30-9:00	12:30-9:00	12:30-9:00	12:30-9:00	OFF

Article II. Facility Equipment

2.01 Card Access System Overview

The McGann card access system controls and monitors both transient and monthly parkers for the project. This system comprises three integrated software applications—Card Access, Count Monitoring and Reporting.

The card access system allows individual parker accounts and cards to be created, edited and deleted as necessary.

The count monitor system interfaces with lane devices to show statistics and monitoring status information as well as all count statistics for monthly, transient and nested spaces.

The reporting application provides specific cardholder, access card and facility count information based on user defined parameters.

2.02 Software Installation (installation instructions do not seem to be appropriate for this manual, in that this is typically a one-time activity not an ongoing training item.)

A. ***Installing in Windows NT 4.0***

1) When installing the McGANN Card Access system in Windows NT 4.0 you must install the three program disks, the four support disks, the ODBC drivers (2 disks), and the Sentinel driver (1 disk).

B. ***Installing Program and Support Disks***

1) Start Windows NT 4.0

2) Insert program disk 1 (of 7) into the floppy disk drive.

3) Click on the Start bar and select Run.

4) In the Run dialog box that displays, type A:\setup.exe and then select OK to start the installation program. If you are installing from a driver other than A, replace "A" with the appropriate drive letter.

5) You will be prompted for program disk 2. At the prompt, remove disk 1 from the drive, insert disk 2, and select OK. Follow this procedure for the third program disk and the four support disks.

6) When you reach the last support disk, you will be prompted for registration information. Enter the appropriate information in the text boxes and select OK. Remove the disk from the drive.

7) If Installation was successful, a message box will display letting you know that installation is complete. Select OK.

8) The McGANN software program icons are automatically created.

C. *Card Access System-Card Reports*

With the Card Access system you have access to the reports in the Card menu of the Report Generator. This section describes each of these reports.

All McGANN Software Systems applications should run in the MCGANN directory.

D. *Card Status Report*

This report prints a card access report from the card status file. The file is automatically updated each time a card is used in a card reader. A record is kept for each card number in the system. The card status file can be edited from the McGANN Card Access system. To generate a Card Status Report:

1) Choose File/Card Status.

2) Choose your Sort fields from the following: Card Number, In/Out Status, Mode, Holiday Access, Last Name, First Name, and Issue Level. By default, Card Number is the first sort. At least one sort field must always be selected. Choose the "None" options on the second and third sort fields if you do not need secondary sorts.

3) Select the fields you want to appear in the report. All fields are selected by default. Or, mark Standard Report to select all fields.

4) Choose the desired Report Output: Screen, Printer, or File. For more information on report output, see the Report Output screen. (See the jump at the bottom of the window).

5) Select OK. The Card Status Report Input screen displays, allowing you to set the report parameters for fields.

6) Select the desired Report Fields by clicking on the check boxes. Select OK. If you selected Standard Report, the report is created. If you did not select Standard Report, the Report Layout Screen displays.

7) When you are satisfied with the layout of your report, select the Create Report button. The report will be sent to the screen, printer, or file. If sent to the screen, it will be displayed in the Print Preview Window.

E. ***Card Activity Report***

This report accesses card transactions stored in daily activity files on the PC. To generate a Card Activity Report:

1) Choose File/Card Activity Report.

2) Select your Sort fields, up to three from the following: Card Number, Reader, Direction, Date and Time, Access Type, and Allowed Access. Card Number is the default sort. Choose None for the second and third sort fields if you do not need secondary sorts.

3) Select the fields for the report. By default, all fields are selected. Select the All button to select the fields.

4) Choose the Output: Screen, Printer, or File. For information on report output, see the Report Output screen. (See the jump at the bottom of the window).

5) Choose OK. The Card Activity Input Screen displays.

6) Enter the Beginning and Ending Dates and Times. The current system date is the default. The times are in 24-hour military format. An error will result if the ending date/time precedes the beginning date/time.

7) Select the Report Fields by clicking in the check boxes to select or deselect an option.

8) Depending on the field selected, you will be asked to enter a range of numbers or to make a selection from a list under Report Parameters.

9) The Access Type list box allows you to select more than one option. Access types are divided into two categories: Access Allowed and Access Denied. Each category has its own access types. (See the Access Types jump at the bottom of this window).

10) When you are satisfied with the layout of your report, select the Create Report button. The report will be sent to the screen, printer, or file. If sent to the screen, it will be displayed in the Print Preview Window.

F. ***Last Activity Report***

This report displays the last transaction recorded for a card and is sorted by Card Number. To generate a Last Activity Report:

1) Choose Card/Last Activity Report. The Last Activity Report dialog box displays.

2) Select the desired Activity Dates option: All Dates or Specific Date. If you select Specific Date, you can select a range of dates by entering the beginning and ending dates. The current date appears by default in both date fields.

3) Choose a group of cards for the report. All cards are automatically selected when the report screen appears. Enter new Beginning and Ending numbers to change the card number range.

4) Select the Output: Screen, Printer, or File.

5) Select OK to create the report. Reports sent to the screen will be displayed in the Print Preview window.

G. ***Holiday Report***

This report lists all the holidays that were added to the holiday schedule in the McGANN Card Access system. To generate a Holiday Report:

1) Choose Card/Holiday Report. The Holiday Report screen displays.

2) Select the Output: Screen, Printer, or File. For information on report output, see the Report Output screen.

3) Select OK. The report is created.

H. ***Cardholder Report***

This report allows a user to view information stored in the McGANN Card Access system Parker Database. To generate a Cardholder Report:

1) Choose Card/Cardholder Report. The Cardholder Report dialog box displays.

2) Select up to three Sort fields. Card Number is, by default, the primary sort. At least one sort field must be selected.

3) Select the fields to be displayed in the report. Card Number, First and Last Name, and Middle Initial fields will always exist; other field names will vary depending on how you set up the Parker Database.

4) Select the Output: Screen, Printer, or File. Select OK. The Cardholder Report Input Screen displays. For more information on report output, see the Report screen. (See the jump at the bottom of the window).

5) Choose a field from the list of Available Report Fields and then select the Add button.

6) Depending on the field selected, Report Parameter options are displayed in the bottom half of the screen. Up to three fields can be selected. Enter

a range of numbers, dates, dollars, or enter a single text item to correspond with the selected field.

7) To delete a field that has been selected, choose the field from the list again, and then select the Delete button to remove the field and parameters from display.

8) Select OK to continue. The Report Layout Screen displays.

9) When you are satisfied with the layout of your report, select the Create Report button. The report will be sent to the screen, printer, or file.

l. ***Alarms Report***

This report display the alarms recorded in the McGANN Card Access system. To generate an Alarms Report:

1) Choose Card/Alarms Report. The Alarms Report dialog box displays.

2) Select the Sort fields under Report Options: Alarm, Date and Time, Reader, and Status. By default, Alarm is the primary sort. At least one sort field must be selected.

3) Select the Output: Screen, Printer, or File.

4) Select OK. The Alarm Report Input Screen displays.

5) Enter the Beginning and Ending Dates and Times. The current system date is the default date. Time is in 24-hour military format. An error will result if the ending date/time precedes the beginning date/time.

6) To set Report Parameters for the Alarm Type, Reader, or Alarm Status. Click on the check boxes to select/deselect a report field. Select OK after all parameters have been entered.

7) Select OK to continue. The Report Layout Screen displays.

8) When satisfied with the report layout, select the Create Report button. The report is sent to the screen, printer, or file. If sent to the screen, the report is displayed in the Print Preview Window.

2.03 Card Access System-Count Monitor Reports

With the Card Access system you have access to the reports in the count menu of the report Generator. This section describes each of these reports.

NOTE: All McGANN Software Systems applications should run in the MCGANN directory.

A. ***Count Totals Report***

This report displays differential, entrance, and exit counts recorded at a specific time. To generate a count totals report:

1) Choose Count/Totals Report. The Count Totals Report dialog box displays.

2) Select a report Date and Time. The date defaults to the current system date. If counts were not recorded at the specified time, the report program displays the next time that counts were recorded on the report date. You can use that time, enter a different time, or exit the report.

3) Select the Fields to be displayed in the report. Or, select the All button to select all the fields.

4) Select the Output: Screen, Printer, or File.

5) Select OK to create the report. If sent to the screen, the report will be displayed in the Print Preview Window.

B. ***Count Statistics Report***

This report is similar to the Count Totals Report. The report displays differential, entrance, and exit counts recorded at a beginning and ending report date. To generate a count statistics report:

1) Choose Count/Count Statistics Report. The Count Statistics Report dialog box displays.

2) Select a Beginning and Ending Date and Time. The dates default to the current system date. Make sure that the beginning date and time precedes the ending date and time.

3) Select the fields to be displayed in the report. Or, select the All button to select all the fields.

4) Select the Output: Screen, Printer, or File.

5) Select OK to create the report. If sent to the screen, the report will display in the Print Preview Window.

C. *Count Activity Report*

This report prints all differential, entrance, or exit totals that were recorded during a report period. The data is listed by time or date. To generate a count activity report:

1) Choose Count/Count Activity Report. The Count Activity Report dialog box displays.

2) Enter the Beginning and Ending report Dates and Times. The dates default to the current system date. Time is in 24-hour military format.

3) Select the Type of Counts you want in the report. Depending on the type selected, the list of fields will change. NOTE: If no fields are displayed in the list, the program was unable to locate an activity file with that type of count stored. In that case, the report cannot be run.

4) Select the fields to be displayed in the report.

5) Select the Output: Screen, Printer, or File.

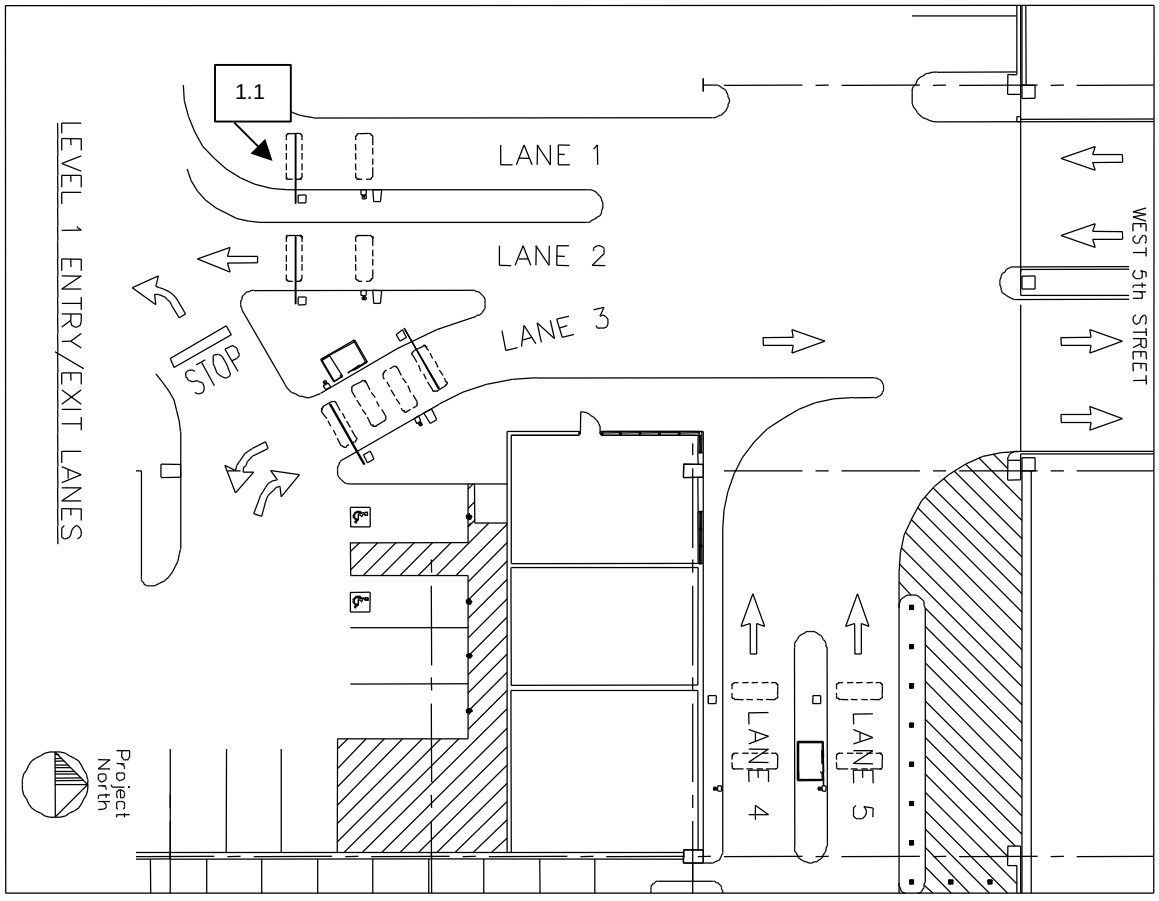
6) Select OK to continue. The Report Layout Screen displays.

7) When satisfied with the report layout, select the Create Report button. The report is sent to the screen, printer, or file. If sent to the screen, the report will display in the Print Preview Window.

2.04 Equipment Inventory

The following reflects facility drawings as well as all transient and monthly equipment:

Parking Facility Name
Sample Parking Facility Operations Manual
Date



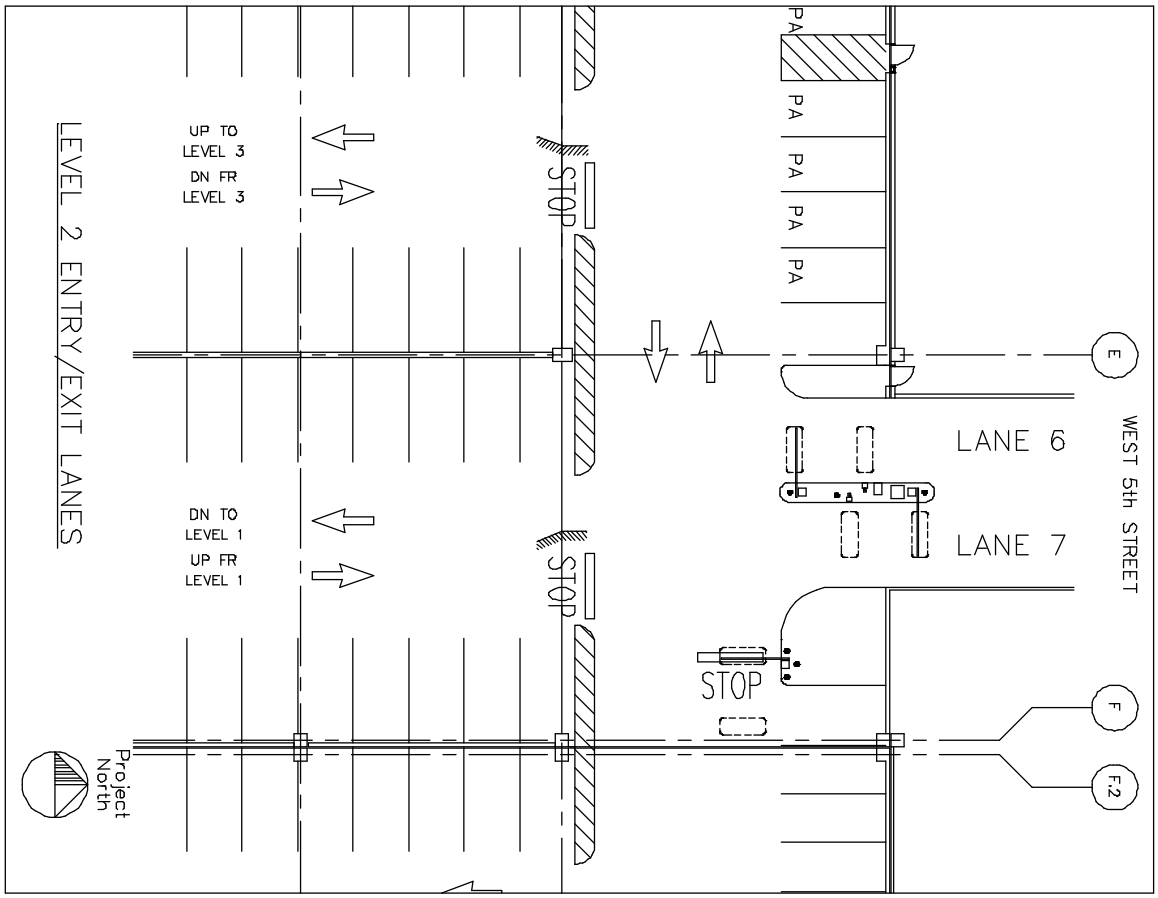
Parking Facility Name
Sample Parking Facility Operations Manual
Date

It is recommended that a unique # be assigned to each piece of equipment and reference it in the facility drawings such as the schematic above.

Lane #	Qty	Item	Model #	Serial #	Warranty to:
1	1	AVI Reader	A-1610		
1	1	Pedestal	RM-100		
1	1	Barrier Gate	AGP-1710		
1	1	Aluminum Folding Gate Arm	AL-20		
1	1	Mag Stripe Ticket Dispenser	ETP-22		
1	1	Duel Vehicle Detector	AGP-0234		
1	1	Lane Controller	I/O 7000		
1	2	Vehicle Detector Loop	L-5		
2	1	AVI Reader	A-1610		
2	1	Pedestal	RM-100		
2	1	Barrier Gate	AGP-1710		
2	1	Aluminum Folding Gate Arm	AL-20		
2	1	Mag Stripe Ticket Dispenser	ETP-22		
2	1	Duel Vehicle Detector	AGP-0234		
2	1	Lane Controller	I/O 7000		
2	2	Vehicle Detector Loop	L-5		
3	2	AVI Reader	A-1610		
3	2	Pedestal	RM-100		
3	2	Barrier Gate	AGP-1710		
3	2	Aluminum Folding Gate Arm	AL-20		
3	1	Mag Stripe Ticket Dispenser	ETP-22		
3	2	Duel Vehicle Detector	AGP-0234		
3	4	Vehicle Detector Loop	L-5		
4	1	Fee Computer	AGP-5200		
4	1	Ticket Validator	AGP-500		
4	1	Fee Indicator	AGP-5900		
4	1	Ticket Lock Box	AGP-0500		
4	1	AVI Reader	A-1620		
4	1	Pedestal	RM-100		
4	1	Barrier Gate	AGP-1710		
4	1	Aluminum Folding Gate Arm	AL-20		
4	1	Duel Vehicle Detector	AGP-0234		

4	1	UPS-Fee Computer	N/A		
4	1	TC-Converter	N/A		
4	1	Lane Controller	I/O 7000		
4	2	Vehicle Detector Loop	L-5		
5	1	AVI Reader	A-1610		
5	1	Pedestal	RM-100		
5	1	Barrier Gate	AGP-1710		
5	1	Attendant Booth	N/A		
5	1	Fee Computer	AGP-5200		
5	1	Ticket Validator	AGP-500		
5	1	Fee Indicator	AGP-5900		
5	1	Ticket Lock Box	AGP-0500		
5	1	Aluminum Folding Gate Arm	AL-20		
5	1	Duel Vehicle Detector	AGP-0234		
5	1	Lane Controller	I/O 7000		
5	2	Vehicle Detector Loop	L-5		

Parking Facility Name
Sample Parking Facility Operations Manual
Date



Lane #	Qty	Item	Model #	Serial #	Warranty to:
6	1	AVI Reader	A-1610		
6	1	Pedestal	RM-100		
6	1	Barrier Gate	AGP-1710		
6	1	Aluminum Folding Gate Arm	AL-20		
6	1	Mag Stripe Ticket Dispenser	ETP-22		

6	1	Duel Vehicle Detector	AGP-0234		
6	1	Lane Controller	I/O 7000		
6	2	Vehicle Detector Loop	L-5		
6	1	Lane Controller	I/O 7000		
7	1	AVI Reader	A-1610		
7	1	Pedestal	RM-100		
7	1	Barrier Gate	AGP-1710		
7	1	Aluminum Folding Gate Arm	AL-20		
7	1	Mag Stripe Ticket Dispenser	ETP-22		
7	1	Duel Vehicle Detector	AGP-0234		
7	1	Lane Controller	I/O 7000		
7	2	Vehicle Detector Loop	L-5		

Parking Facility Name
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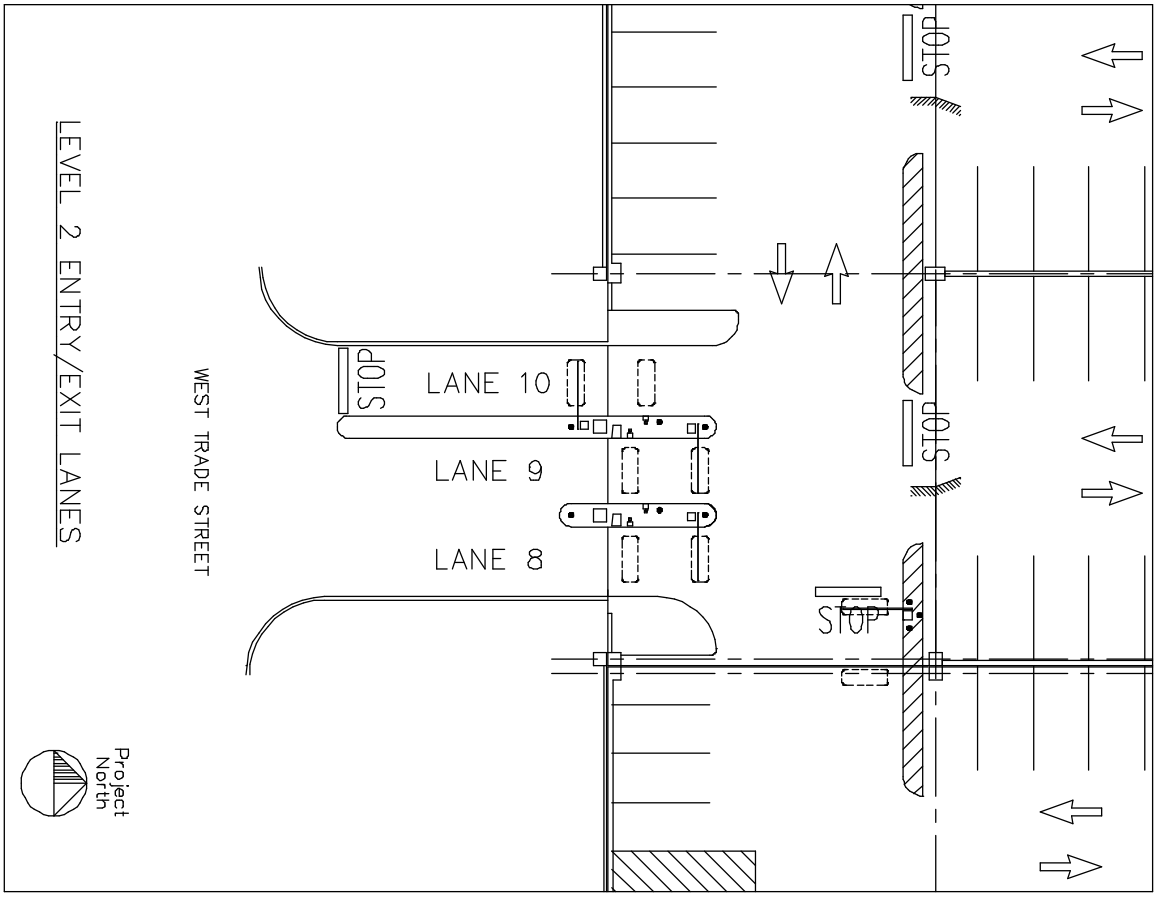
Date



Lane #	Qty	Item	Model #	Serial #	Warranty to:
8	1	AVI Reader	A-1620		
8	1	Pedestal	RM-100		
8	1	Barrier Gate	AGP-1710		
8	1	Aluminum Folding Gate Arm	AL-20		
8	1	Mag Stripe Ticket Dispenser	ETP-22		
8	1	Duel Vehicle Detector	AGP-0234		
8	1	Lane Controller	I/O 7000		
8	2	Vehicle Detector Loop	L-5		
9	1	AVI Reader	A-1610		
9	1	Pedestal	RM-100		

9	1	Barrier Gate	AGP-1710		
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10	1	AVI Reader	A-1610		
10	1	Pedestal	RM-100		
10	1	Barrier Gate	AGP-1710		
10	1	Aluminum Folding Gate Arm	AL-20		
10	1	Duel Vehicle Detector	AGP-0234		

2.05 Fee Computers –Overview/Operation

The facility is equipped with Amano AGP-5200 machine readable fee computers at two transient exits along with Amano AGP-5600 ticket validators and fee displays.

2.06 Ticket Issuing Machines

The facility is equipped with Amano EPT-22 Mag stripe ticket dispensers at each entrance. This online equipment is centralized in the parking office and is able to handle remote vends and signal any trouble or jam alarms.

Insert Spitter Here

2.07 Barrier Gate Overview

The facility is equipped with Amano AGP-1710 barrier gates that control entry and exit. These online devices are programmed to signal illegal vehicle backout and other control functions as well as being time/date programmable to raise and lower at prescribed days and times through the system "switching" function.

2.09 Reversible Lanes Overview

Facility lanes 3 and 9 serve as reversible lanes to handle peak time ingress/egress. Lane 3 allows transient and monthly entrance and monthly only exit and is set to entrance mode

Monday – Friday, 5am to 10am to accommodate peak ingress and is set to exit mode 10:01 am to 9pm. Lane 9 allows transient and monthly entrance and monthly exit only and is set to entrance mode Monday – Friday, 5am to 10 pm to accommodate peak egress and is set to exit mode 10:01am to 9:00 pm.

2.08 Anti-Passback Overview

The anti-passback options for the system include true soft, timed soft, true hard and timed hard. The facility will operate with the true soft option allowing parkers access but logging an access violation. First time violators will be sent a notice indicating that a passback violation has been logged. Abuses are documented and reported to the property manager for further action.

2.09 Nesting Equipment

Upon entering the facility, residents have 15 minutes to reach their appropriate nested parking area. If vehicles do not enter nesting areas within the time limit, cards will default into out-of-status mode. When in this mode cards will not function at any reader. Parkers must intercom parking/security to have the gate raised through a PC command. This transaction is logged and a warning letter sent to the parker. Abuses are documented and reported to the property manager for further action.

2.10 Facility Entrances

A. ***Ticket Issuing Machine***

This device controls transient entrance lane use. With the mode of operation set for ENTRANCE, the entrance lane gate operates in the DOWN position.

1) The ticket issuing machine operates in conjunction with the lane's barrier gate and vehicle opening and closing detectors.

2) A transient parker gains entry by driving into an entrance lane, which signals the vehicle arming detector, and pushing a button on the ticket dispenser.

3) A ticket is issued and the gate raises when the ticket is removed from the throat of the ticket issuing machine. As the vehicle crosses over the closing vehicle detector the gate closes.

4) The barrier gate is equipped with a feature called "extra-sensory" causing the arm to reverse its downward direction in the event it comes in contact with any object. All barrier gate arms are equipped with standard caution reflectors, approved industry warning signs, and padding to minimize liability and damage.

B. ***Amtech (RFID) Reader***

This device controls monthly entrance lane use. With the mode of operation set for ENTRANCE, the entrance lane gate operates in the DOWN position

1) The Amtech Reader operates in conjunction with the lane's barrier gate and vehicle opening and closing detectors.

2) A monthly parker gains entry by driving into an entrance lane, which signals the vehicle arming detector.

3) The Amtech Reader scans the entrance lane area for a valid, vehicle-mounted access card. Valid access cards cause barrier gates to raise. As the vehicle crosses over the closing vehicle detector the gate closes.

4) The barrier gate is equipped with a feature called "extra-sensory" causing the arm to reverse its downward direction in the event it comes in contact with any object. All barrier gate arms are equipped with

standard caution reflectors, approved industry warning signs, and padding to minimize liability and damage.

5) Invalid access cards, due to lockout or out-of-status, will not cause the gate to raise. An intercom is located on a pedestal in the drive lane for communication to the facility office to determine the problem and resolve the situation.

C. ***Lot Full Signs***

These signs are present at all facility entrances. When the number of transient spaces reaches capacity, the Lot Full sign is illuminated and the ticket dispenser disabled.

2.11 Facility Exits

A. ***Transient Parkers***

1) These parkers can exit the facility in one of two lanes. Parkers must present the facility entrance ticket to the cashier.

2) The Fee Computer will calculate the parker's fee. The parker pays the cashier the appropriate fee and causes the gate to rise.

3) The vehicle crossing over the closing loop causes the gate to lower.

B. ***Monthly Parkers***

1) These parkers can exit the facility through any of five lanes. A valid access card sends a signal to the gate to open.

2) The vehicle crossing over the closing vehicle detector will cause the gate to lower.

3) If monthly parkers have an invalid access card, the system will NOT raise the exit gate. An intercom is located on a pedestal for communication to the facility office to determine the problem and to resolve the situation.

2.12 Equipment Malfunctions

A. ***Ticket Issuing Machines***

1) When ticket issuing machines malfunction, parkers are to contact the parking office/security by using the entry lane intercom.

2) A staff member will be dispatched to the entrance to correct the error and provide entry to the parker.

3) Patrons that are unable or unwilling to wait may back-out and use another facility entrance.

4) A log of the malfunction is maintained by facility maintenance staff to identify potential long-term problems and take appropriate action such as parts replacement or placing service calls.

B. ***Barrier Gates***

1) When barrier gates malfunction, parkers are to contact the parking office/security by using the entry/exit lane intercom.

2) A staff member will be dispatched to the entrance/exit to correct the error and provide entry or exit to the parker.

3) Patrons that are unable or unwilling to wait may back-out and use another facility entrance or exit.

4) A log of the malfunction is maintained by facility maintenance staff to identify potential long-term problems and take appropriate action such as parts replacement or placing service calls.

C. ***Readers***

1) When readers malfunction, parkers are to contact the parking office/security by using the entry/exit lane intercom.

2) A staff member will be dispatched to the entrance/exit to correct the error and provide entry or exit to the parker.

3) Patrons that are unable or unwilling to wait may back-out and use another facility entrance or exit.

4) A log of the malfunction is maintained by facility maintenance staff to identify potential long-term problems and take appropriate action such as parts replacement or placing service calls.

Article III. Monthly Contract Parking

At times the facility is operating at maximum diversity, which means no monthly spaces are available for lease; a parking waitlist will be implemented. When adding monthly waitlist individuals the steps below are to be followed to ensure a smooth transition for the parker.

3.01 Adding Waitlist Monthly Parking

A. *The On-Site Bookkeeper contacts the first person listed on the Waiting List by phone to attempt to fill the available space. The person is offered the available space. Individuals who do not want to contract monthly parking when called have two options.*

1) Individuals can be moved to the bottom of the Waiting List.

2) Individuals can have their name removed entirely from the Waiting List.

B. *The individual is given three once called. If no response is received within the designated timeframe, the On-Site Bookkeeper will automatically move their name to the bottom of the Waiting List.*

C. *The next individual on the Waiting List is contacted by the On-Site Bookkeeper until all available spaces designated as monthly parking spaces are filled.*

3.02 Adding Monthly Parking

A standardized, two-part Monthly Parking Contract includes the parker's name, address, work telephone, home telephone, license tag number(s), employer, BOA Mailcode (if applicable), current parking rate, parking start date, parking facility location, payment option chosen, payment due dates, access card number, access card security deposit (if applicable) and general parking policies and procedures.

A. *Individuals accepting a space for monthly parking are instructed by the On-Site Bookkeeper to come to the Gateway Village Parking Facility office between 7 a.m.-9 p.m., Monday-Friday to complete the appropriate paperwork and sign up for a monthly parking space.*

B. *The parker will be asked to provide the following information or documentation upon registration.*

1) Vehicle registration

2) First month's payment

3) Card deposit

4) A voided check if they opt for the Automatic Draft Payment Option.

C. *Each new parker must read and sign the parking contract and must complete all requested information.*

D. *The parker will choose either autodraft or invoicing payment option.*

E. *The On-Site Bookkeeper will retain the original of the completed Monthly Parking Contract and provide the parker with a copy for reference (i.e., payment due dates, cancellation terms, rules & regulations, etc.).*

3.03 Monthly Parking Payment Options

Monthly parkers will be offered several payment options. They may choose the monthly invoicing option, autodraft option or pay online through E-Z Parking's secure server at www.gatewayvillage.com/parking.htm

A. *Parkers set up as invoiced accounts receive monthly bills and may pay with cash, check, bank-generated check, money order, debit card, credit card or online.*

1) The On-Site Bookkeeper enters all data from the completed Monthly Parking Contract into the GAS System.

2) Invoices are prepared for all parkers by the On-Site Bookkeeper no later than the 26th of each month.

3) Invoices are mailed no later than the 28th of each month to allow parkers to make payment by the due date of the 5th.

4) Adjustment made to parker accounts including deletes, adds, credits, etc. must be recorded by the On-Site Bookkeeper on the A/R Adjustment Form and approved by the Manager.

5) The On-Site Bookkeeper is not authorized to make adjustments to parker accounts without preparing the appropriate documentation and obtaining the written approval by assigned management staff.

B. *Parkers set up as autodraft individuals have their checking accounts drafted for the cost of monthly parking the first business day of each month.*

1) An Autodraft Agreement must be signed and dated by each parker choosing this payment method. A voided check or a voided savings account deposit slip (including the bank name and transit routing number) must be provided.

2) Since some banks do not have complete account numbers shown on deposit slips, it is requested that no deposit slips be accepted in lieu of voided checks if at all possible.

3) Check copies or copies of savings account statements showing the account number are acceptable in lieu of original checks

4) Paperwork for all Automatic Draft additions (i.e., signed Autodraft Agreement and voided check or deposit slip) showing the starting month must be forwarded to the Main Office accounting staff by the On-Site Bookkeeper on a daily basis.

5) Parkers opting to be autodrafted must sign the Autodraft Agreement by the 15th of any month to establish the autodraft for the first business day of the upcoming month.

C. *Parkers set up as invoiced accounts can pay monthly accounts online with credit or debit cards through E-Z Parking's secure server.*

3.04 Account Billing Adjustments

Every adjustment made to the GAS System, including deletes, credits, etc., must be recorded by the On-Site Bookkeeper on an A/R Adjustment Form and approved by the Manager.

The Main Office staff provides the On-Site Bookkeeper with information relating to returns via automatic draft due to insufficient funds, stop payments, etc. on a monthly basis (See also Automatic Draft Returns Procedure). These entries are posted as negative entries in the GAS System by the On-Site Bookkeeper using a date specified by the Main Office.

Once repayment of the returns is received, the received amount will be posted in the GAS System by the On-Site Bookkeeper as a normal payment.

The On-Site Bookkeeper is not authorized to make any adjustments to the GAS System without preparing the proper paperwork and obtaining the written approval by assigned management staff or receiving authorization from the Main Office accounting staff.

3.05 Account Cancellations

Parkers who opt for the automatic draft option must provide 30 days' advance written notice to cancel their automatic draft. When verbal cancellation is received via the telephone, the On-Site Bookkeeper should always request that written notice of the cancellation be sent to us via fax, mail, or email or ask the parker to come to the parking office and sign a cancellation notice. Cancellations must be received prior to the 15th of any month to be effective the following month. Cancellations received after the 15th of any month will not be effective until the second month following cancellation unless prior approval has been obtained from the Manager.

Proper documentation of the cancellation by the On-Site Bookkeeper should be forwarded to the Main Office on a daily basis for processing by the Main Office accounting staff into the Microcash System and should include the written cancellation by the parker as well as the approved cancellation form. All cancellations should be approved by the Manager prior to forwarding to the Main Office accounting staff.

In cases where 30 days' advance written notice of cancellation may not be possible (i.e., abrupt termination of employment, illness, etc.), management may approve cancellation earlier than the required 30 days.

3.06 Access Card Histories

All access cards will have a separate index card completed when they are received from the manufacturer. The On-Site Bookkeeper records the parker's name and the date the access card was issued on the appropriate index card for each relevant access card number at the time of setup or replacement. This procedure provides the history of an access card from the time it is received from the manufacturer. Periodic audits from the access card history records to the Access Control System and again to the GAS System offer management an opportunity to conduct thorough audits.

3.07 Delinquent Payment Policy

Monthly payments should be received by the Parking Management office staff no later than the 5th of each month for the current parking month. Any payments not received by the 5th of each month will be considered delinquent.

3.08 Grace Period

A grace period until the 15th of each month for the current parking month will be allowed for receipt of payments.

3.09 Account Aged A/R Report

The aged A/R Report generated by the GAS System provides data necessary to aid in delinquent collections and subsequent access card deactivation; thereby reducing delinquencies and unpaid balances.

The On-Site Bookkeeper generates the aged A/R Report on the 15th of each month and forwards to the Manager for review. Access cards for these accounts are de-activated until payment has been made. The On-Site Bookkeeper contacts each delinquent parker via telephone in order to attempt collection of the outstanding payment. The On-Site Bookkeeper informs the parker that access cards have been de-activated and cannot be re-activated until the outstanding balance is paid.

3.10 Access Card Cutoff/Reactivation

A. All parkers who have not paid for the current parking month by the 15th of the month and whose name still appears as delinquent on the aged A/R Report will have their access card de-activated.

B. A letter will then be mailed requesting immediate payment or the return of their access card.

C. If no payment is received and no contact has been made by the delinquent parker by the 30th of the month, a final letter will be mailed stating their parking privileges have been terminated and again requesting the return of their access card. At this time, the On-Site Bookkeeper will complete the termination paperwork, obtain the Manager's signature, and provide copies to the Main Office accounting staff with a request to reverse the card deposit to Other Income on the G/L.

D. The On-Site Bookkeeper will record any adjustment entries necessary on the A/R Adjustment form, obtain the manager's signature, and enter the adjustment in the GAS System to close the delinquent parker's account. The access card history file will be properly updated at this time and the access card will be considered as non-returnable.

E. Once payment has been received in full (or acceptable payment arrangements have been made with the approval of the Manager) and subsequently posted to the GAS System by the On-Site Bookkeeper, the access card will be reactivated in the Access Control System by the Manager.

3.11 Returned Check Procedure

Payments received by parkers may not be accepted by the bank for processing and posting to the Gateway Village Parking Facility's checking account due to insufficient funds, closed accounts, or payments stopped by the parkers. There is a time lag of three weeks before E-Z Parking Company receives notification of these. The following outlines the procedures to be implemented for the various types of returned checks.

A. ***Insufficient Funds – Invoiced Parkers***

1) Upon notification by the bank of a parker's returned check due to insufficient funds, the Main Office accounting staff will call the appropriate bank using Merchant Check Verification procedures to determine if funds are available to redeposit in the amount of the return.

2) Appropriate G/L entries will be made to record the return and the returned check amount will be deducted from the Facility's checking account balance by the Main Office accounting staff.

3) If the funds are available for immediate redeposit, the Main Office accounting staff will prepare a deposit slip and forward backup to the On-Site Bookkeeper for entry of both the return and the redeposit into the GAS System.

4) If funds are not available for immediate redeposit, the Main Office accounting staff will notify the Manager to instruct the On-Site Bookkeeper to contact the parker to make a cash payment for the amount of the returned check and any applicable returned check fees. No personal check payments will be accepted. (See also *Returned Check Fees*). The Manager may cut off the access card until such time the proper cash payment has been received.

B. ***Closed Accounts – Invoiced Parkers***

1) Upon notification by the bank of a parker's returned check due to the parker's account being closed, the Main Office accounting staff will make the appropriate G/L entries to record the return and the amount will be deducted from the Facility's checking account.

2) The Main Office accounting staff will notify the Manager to instruct the On-Site Bookkeeper to contact the parker to make immediate cash payment for the amount of the returned check and any applicable returned check fees. No personal check payments will be accepted. (See also *Returned Check Fees*). If no payment is made within two days, the access card will be cut off by the Manager until the balance due is collected.

3) Backup will be forwarded by the Main Office accounting staff to the On-Site Bookkeeper for entry of the closed account return into the appropriate parker's account in the GAS System.

4) Upon receipt of the cash payment, the On-Site Bookkeeper will make the appropriate entry into the GAS System and the Manager will reactivate the access card, if it was previously deactivated.

C. ***Stopped Payments – Invoiced Parkers***

1) Upon notification by the bank of a returned check due to a payment being stopped by the parker, the Main Office accounting staff will make the appropriate G/L entries to record the return and the amount will be deducted from the Facility's checking account.

2) The Main Office accounting staff will notify the Manager to instruct the On-Site Bookkeeper to contact the parker to make immediate cash payment for the amount of the stopped payment and any applicable returned check fees. No personal check payments will be accepted. If no payment is made within two days, the access card will be cut off by the Manager until the balance due is collected.

3) Backup will be forwarded by the Main Office Accounting staff to the On-Site Bookkeeper for entry of the return into the GAS System.

4) Upon receipt of the cash payment, the On-Site Bookkeeper will make the appropriate entry into the GAS System and the Manager will reactivate the access card, if it was previously deactivated.

3.12 Returned Check Fees – Invoiced Parkers

No returned check fees are charged for the first violation of a returned check. Returns due to a closed account or a stopped payment initiated by a parker will result in a return fee of a minimum of $20.00. Second occurrences will result in a Returned Check Fee of $20.00, in addition to the original parking amount. A third violation will result in a returned check of $20.00, in addition to full payment of the delinquent parking, and possible removal of all parking privileges.

3.13 Autodraft – Insufficient Funds

Payments set up via automatic draft may not be accepted by the bank for processing and posting to the Gateway Village Parking Facility's checking account due to insufficient funds, closed accounts, or payments stopped by the parkers. There is a time lag of three weeks before E-Z Parking receives notification of these returns. The following outlines the procedures to be implemented for the various types of Automatic Draft returns.

A. ***Insufficient Funds***

1) Upon notification by the bank of a return for a payment made via Automatic Draft due to insufficient funds, the Main Office accounting staff will make the appropriate G/L entries to record the return and the returned amount will be deducted from the Facility's checking account.

2) Since Automatic Drafts are generally made only on the first business day of each month, unless otherwise established, the Main Office accounting staff will notify the Manager to instruct the On-Site Bookkeeper to contact the parker to make a cash payment for the amount of the return and any applicable return fees due to insufficient funds. No personal check payments will be accepted. (See also *Return Fees*).

3) The On-Site Bookkeeper will post a negative entry to the GAS System for the amount of the return. If no payment is made within two days, the Manager will deactivate the access card until the balance due is collected.

4) Once the cash payment is received, the On-Site Bookkeeper will make the appropriate entry into the GAS System to post the collected payment and any returned check fees and will notify the Manager to reactivate the access card, if it was previously deactivated. The On-Site Bookkeeper will then prepare a separate deposit slip and attach the appropriate autodraft return documentation and the daily Cash Receipts Journal from the GAS System which will provide the Main Office accounting staff with the necessary information to post to the G/L and Monthly Revenue Report. The On-Site Bookkeeper will make the appropriate entry into the GAS System, and the Manager will reactivate the access card, if it was previously deactivated.

5) At the request of the Manager, the individual parker who had insufficient funds via their automatic draft option may be removed from the automatic payment option. Generally, this is not implemented unless two or more incidents have occurred.

B. ***Closed Accounts***

1) Upon notification by the bank of a return via Automatic Draft due to the parker's account being closed, the Main Office accounting staff will make the appropriate G/L entries to record the return and the amount will be deducted from the Facility's checking account.

2) The Main Office accounting staff will notify the Manager to instruct the On-Site Bookkeeper to contact the parker to make immediate cash payment for the amount of the returned Automatic Draft and any

applicable return fees. No personal check payments will be accepted. (See also *Return Fees*). If no payment is made within two days, the access card will be cut off by the Manager until the balance due is collected.

3) The On-Site Bookkeeper will post a negative entry to the applicable parker's A/R account in the GAS System for the amount of the return.

4) Once the cash payment is received, the On-Site Bookkeeper will make a separate deposit slip and attach the appropriate Automatic Draft return documentation which will provide the Main Office accounting staff with the necessary information to post to the G/L and Monthly Revenue Report. The On-Site Bookkeeper will make the appropriate entry into the parker's A/R account in the GAS System, and the Manager will reactivate the access card, if it was previously deactivated.

5) At the request of the Manager, the individual parker who had insufficient funds via their automatic draft option may be removed from the automatic payment option. Generally, this is not implemented unless two or more instances have occurred.

C. ***Stopped Payments***

1) Upon notification by the bank of a return via Automatic Draft due to a payment being stopped by the parker, the Main Office accounting staff will make the appropriate G/L entries to record the return and the amount will be deducted from the Facility's checking account.

2) The Main Office accounting staff will notify the Manager to instruct the On-Site Bookkeeper to contact the parker to make immediate cash payment for the amount of the stopped payment and any applicable return fees. No personal check payments will be accepted. (See also *Return Fees*). If no payment is made within two days, the access card will be cut off by the Manager until the balance due is collected.

3) The On-Site Bookkeeper will post a negative entry to the parker's A/R account in the GAS System for the amount of the return using the backup provided by the Main Office accounting staff.

4) Once the cash payment is received, the On-Site Bookkeeper will make a separate deposit slip and attach the appropriate Automatic Draft return documentation which will provide the Main Office accounting staff with the necessary information to post to the G/L and Monthly Revenue Report. The On-Site Bookkeeper will make the appropriate entry into the GAS System, and the Manager will reactivate the access card, if it was previously deactivated.

3.14 Autodraft Account Return Fees

No fees will be assessed for the first violation of an Automatic Draft returned due to insufficient funds. Returns due to a closed account or a stopped payment initiated by a parker will result in a return fee of a minimum of $20.00. Second occurrences will result in a Return Fee of $20.00, in addition to the original parking amount. A third violation should result in a Return Fee of $20.00, in addition to full payment of the original parking amount, and possible removal of all parking privileges.

3.15 No Charge Monthly Parkers

Parkers who are allowed to park monthly at no charge must be approved in writing by an authorized Cousins' staff member. These may include building tenants, parking management staff, Cousins' staff, or others approved solely by Cousins.

Any parker who receives no charge parking must complete and sign a Monthly Parking Contract in order to enter them into both the GAS System and the Access Control System. Exceptions may result in incomplete or inaccurate reporting of card inventories, card audits, space counts utilized, and other important Facility data.

3.16 No Charge Reporting

As part of the month-end close process on the GAS System, the On-Site Bookkeeper will print a Rate Code Listing and forward it to the Main Office Accounting staff for compilation of the monthly No Charge or Free and Discounted amount. The total amount will be reflected in the Income portion of the Monthly Income & Expense Statement.

3.17 Card Replacement

Access cards may need to be replaced from time to time due to being lost or stolen or simply from normal wear and tear. Specific guidelines should be followed as outlined below. Replacement cards will be issued upon receipt of original cards if they are being replaced due to normal wear and tear.

A. ***Inventory Report***

1) The returned access card will be re-entered into inventory by the On-Site Bookkeeper via the Inventory Report. An explanation for any returned access card should be noted in the Comments section of the Inventory Report.

2) If the access card being returned into inventory is damaged, it should be either maintained separately from the valid access cards or destroyed by the Manager.

3) If a replacement access card is issued for which the original access card was lost or stolen, the old access card number should be referenced with an explanation of such in the Comments section.

B. ***GAS System***

The original access card number assigned to the parker is removed from the GAS System and replaced with the replacement access card number by the On-Site Bookkeeper to ensure adequate data is maintained at all times and for ease in conducting periodic Card Audits.

C. *Access Card Histories*

The Access Card History index card for the original access card number should be posted with a comment by the On-Site Bookkeeper explaining the return (i.e., lost, stolen, replaced due to wear and tear, damaged, etc.).

D. *Access Control System*

If a replacement card is issued due to being lost, stolen, or damaged, the original access card number assigned to the parker should be removed from the Access Control System. This process prevents "found" cards from being used by non-paying parkers.

E. *Fee Charged*

A replacement fee will not be charged for normal access card deterioration. If an access card is damaged due to bending, excessive heat or sunlight exposure, or other damage caused by the parker, or if an access card is being replaced due to being lost or stolen, a fee of $10.00 will be charged.

3.18 Access Card Return

Upon the return of an access card due to cancellation, the following steps should be implemented.

A. ***Card Deposit Refund***

1) Card deposits are issued when accounts have been canceled and all remaining balances due from the monthly parker have been collected.

2) The On-Site Bookkeeper will prepare an A/P Voucher (approved by the Manager) and attach the appropriate documentation to refund the parker.

3) Refunds of card deposits will not be made until any remaining balances due from the parker for monthly parking are collected. If a parker cancels and has a balance due on their account, which may be uncollectable for a reason approved by the Manager, the card deposit is forfeited.

B. ***Inventory Report***

1) The returned access card will be re-entered into inventory by the On-Site Bookkeeper via the Inventory Report. An explanation for any returned access cards should be noted in the Comments section of the Inventory Report.

2) If the access card being returned into inventory is damaged, it should either be maintained separately from the valid access cards or destroyed by the Manager.

C. ***GAS System***

1) Once the On-Site Bookkeeper has verified there is no balance outstanding on a parker's account, the access card has been returned,

and the Manager has approved all backup cancellation documentation, the On-Site Bookkeeper will delete the parker and appropriate access card from the GAS System

2) Backup documentation required will be a signed cancellation notice from the parker received via mail, fax, or email or other documentation approved by the Manager.

D. ***Access Control System***

When access cards are returned due to cancellation and the Manager has approved the appropriate cancellation backup, the Manager deactivates the access card from the Access Control System.

3.19 Monthly Card Audit

Until such time the Parking Facility is operated at full capacity, complete Monthly Card Audits will be performed by off-site staff. When the Parking Facility is operated at full capacity, spot Card Audits will be performed monthly and complete Card Audits will be performed quarterly.

A. ***Balancing to the GAS System and Access Control System***

All access cards reflected in the GAS System as either no charge or billable accounts must balance to the Access Control System as activated access cards. Any discrepancies will be reported to the Main Office management staff and forwarded to the Facility Manager for explanation and resolution.

B. ***Balancing to Inventory on Hand***

Access cards in inventory, including damaged access cards, will be audited monthly to the actual access cards on hand and reported on the Monthly Inventory Report. Any discrepancies will be reported to the Main Office management staff and forwarded to the Facility Manager for explanation and resolution.

3.20 Vehicle Towing and Immobilization

A. ***Vehicle towing***

1) Illegally parked vehicles may be towed at the owner's expense. Towing is at the discretion of the parking facility manager.

2) The parking office staff will attempt to contact the owner of the vehicle through the license tag prior to towing the vehicle.

3) Vehicles that are towed may be retrieved 24 hours a day by contacting the parking office Monday-Friday, 7am-9pm or by proceeding to the nearest facility intercom system during all other days and hours.

B. ***Vehicle immobilization***

1) Illegally parked vehicles as well as vehicles with outstanding account balances may be immobilized (booted) at the owner's expense. Immobilization is at the discretion of the parking facility manager.

2) The parking office staff will attempt to contact the owner of the vehicle through the license tag prior to immobilizing the vehicle.

3) Vehicles that are booted may be claimed 24 hours a day by contacting the parking office Monday-Friday, 7am-9pm or by proceeding to the nearest facility intercom system during all other days and hours.

Article IV. Facility Communications

4.01 Facility Website

Individuals, organizations and groups can get the latest facility information by logging on to the E-Z Parking Web site at www.gatewayvillage/parking. This site provides general information about the parking facility; contact names and phone numbers; services offered at the facility; how to sign-up, cancel and request additional information as well as other useful items regarding the Gateway Village.

4.02 Facility Parking Guide

E-Z Parking Inc. provides a useful guide to all new facility parkers. This guide explains all the parker needs to know to make use of the garage as pleasant as possible. Information on entrances, exits, services offered, contact names and phone numbers as well as facility maps and diagrams are provided. Guides are available in the garage office.

4.03 Homeowners Associations

The facility manager attends all Homeowner Associations and Post Properties and Blvd. Company meetings to listen to concerns and provide information to homeowners regarding operation of the parking facility.

Article V. Cashier Policies and Procedures

5.01 Fee Computer Log On / Off

A. The facility manager has assigned each cashier a logon code for use on the McGann machine-readable fee computer. Each cashier must logon using their assigned code as well as a distinct password they have chosen.

B. A valid logon code must be used in order to process any transient ticket transactions. Cashiers must logon at the start of each shift and can only process transactions using their personal user code.

C. Cashier will logoff at the end of each shift in order to print shift summary reports, balance their cash drawer and prepare their deposit.

5.02 Fee Computer Passwords/Access Levels

A. The facility manager has a complete, secure listing of all cashier logon codes and passwords. This list is edited on an as needed basis to accommodate new and/or terminated employees.

B. All cashiers are granted user rights compatible with the specific job responsibilities, such as processing manual and machine-read tickets, providing change, and processing full and partial validations.

C. The facility manager has complete system access to include reports, rate structures, and programming.

5.03 Lunch Relief Procedures

A. The first shift cashier (7:00 a.m. - 3:30 p.m.) is able to take a 30-minute break between 11:30 a.m. – 2:30 p.m. or when the split shift cashier is prepared to receive customers.

B. Cashiers for these two shifts will work out of different booths to minimize the scheduling and timing procedures needed if the same booth and fee computer was used.

C. The second shift cashier is able to take their break any time before the first shift cashier is scheduled to complete their shift.

D. The above reflects the normal break parameters. From time to time, special events or other circumstances may require flexibility in their implementation.

5.04 Shift Change Procedures

A. Exit Lane 4 will be closed to allow the cashier to print fee computer closing reports, balance their cash drawer and prepare their deposit. A lane closed sign will be used to direct exiting vehicles to Lane 5.

B. Once closing procedures have been completed, the first shift cashier will wait until their relief is onsite before they are able to clock out for the end of shift. It is important that the first shift cashier be available to re-open and process tickets if the volume of exiting traffic increases or other procedures cause exiting delays.

5.05 Clocking-In/Clocking-Out of Employees

All hourly employees must clock-in at the start of their shift and clock-out at the end of their shift on their respective time card. Written-in times will not be accepted unless approved by E-Z Parking management staff. Employees must clock in and out for all approved breaks and meals and written-in times must be approved.

5.06 Change Funds - Cashiers

Facility cashiers are each issued change funds to be used during their shift. It is the responsibility of the employee to make sure they have appropriate change at the start of each shift.

A. Each employee who is issued a change fund must sign the upper portion of the Change Fund form acknowledging receipt of the stated amount and must sign the lower portion of the Change Fund form upon relinquishing the Change Fund at the end of their employment.

B. An authorized Manager must also sign the upper portion of the Change Fund when issuing the Change Fund and must sign the lower portion acknowledging receipt of the Change Fund at the end of the employee's employment.

C. The signed Change Fund form must be forwarded to the Main Office accounting staff to be retained in the employee'' personnel file and a copy must be attached to the A/P voucher as backup to the A/P check issued.

5.07 Lost Tickets

Transient customers trying to exit the facility without an entry ticket will be required to:

A. Pay the prevailing lost ticket fee of $5.00

B. Present their drivers license to the cashier

The cashier will record the vehicle tag number; driver's first/last name and vehicle make, model and color on a facility lost ticket voucher.

5.08 Processing Validations

A. Cashiers are to calculate the full cost of the parking ticket using the fee computer.

B. Validations are to be deducted from the amount of the ticket.

C. Any balance due on exit tickets is the responsibility of the parker.

D. Authorized validations are identified below.

1) **Residents**

a) Unit-specific, no charge validations are issued to residents.

b) Residents in turn issue these validations to their guests.

c) E-Z Parking re-issues validations to residents as-needed

2) **Retail Tenants**

a) Retailers purchase postage-sized, facility-specific validation stamps in half-hour, hour and all-day ($5.00) increments

b) These validations are sold at the parking office at face value.

c) This allows facility tenants to determine the amount of parking they wish to pay for customers and visitors.

5.09 Insufficient Funds

A. *Transient parkers unable to pay any or all of the calculated fee upon exiting are required to complete the standard facility debit voucher.*

B. *This NCR, two-part document is completed by the cashier and the parker is asked to sign it before exiting.*

1) The top white copy is given to the customer to remit with their payment

2) The cashier includes the yellow copy with their tickets and Cashier Report at shift end to be audited

C. *The cashier will write "would not sign" on the signature line for any customer not willing to sign the debit voucher. Debit vouchers will be tracked for payment by the On-Site Bookkeeper*

5.10 Credit Cards/Check Acceptance

The facility does accept credit cards and debit cards for payment. Checks are acceptable provided the customer's full correct address and home phone number appear on the check. In addition, the customer's daytime work telephone number should be written on the check by the customer or cashier.

NOTE: No starter checks will be accepted.

5.11 Foreign Currency Acceptance

The facility does not accept foreign currency for payment.

5.12 Cashier Shift Balance and Reconciliation

Cashiers are required to balance their cash on hand with fee computer revenue reports at the end of each shift. Deposits must be made in a garage drop safe at the end of each shift. The ticket auditor reconciles each shift's said vs. actual revenue. Overage and shortages are documented on each cashiers report.

5.13 Over/Short Reports

Cashier overages and shortages are calculated as the difference between the amount of the cashier's verified deposit and the amount of the audited ticket revenue.

A. *Cashiers must re-pay any shortages of $5.00 or more.*

B. *An over/short report is forwarded to the property manager along with other monthly settlement reports.*

1) This report details the date of overage/shortage

2) Cashier involved

3) Over/short amount

4) Date shortage repaid

5.14 Cash Drops

The facility is equipped with a series of drop safes to be used by on-duty cashiers for interim and final deposits.

A. Only pre-numbered authorized deposit bags can be used. Cashiers must record all deposits at the time of drop on the appropriate safe log.

B. Drop safes will be emptied daily and only when any two of the appropriate E-Z Parking staff members are present.

C. To ensure an additional level of security the location of drop safes will not be disclosed in this document.

Article VI. Financial Management Overview

E-Z Parking, Inc. has established a separate Bank of America checking account for the purpose of depositing Gateway Village daily receipts and processing vendor payments. Cousins has provided an operating advance for use by E-Z Parking, Inc. to operate the Parking Facility. Quarterly, the cash flow is reviewed by both parties to determine whether the operating advance needs increasing in order to cover monthly expenses should receipts be consistently less than expenses.

6.01 General Ledger Chart of Accounts

E-Z Parking, Inc. utilizes the G/L Chart of Accounts established by Cousins throughout the reporting process. G/L Accounts may be added at any time during the fiscal year. However, G/L Accounts with balances may not be deleted until fiscal yearend.

6.02 Facility Petty Cash Fund

The facility manager has been issued a $200 petty cash fund used for minor purchases which are not considered normal A/P processing, such as gasoline and other miscellaneous supplies, needed to operate the Facility.

A. The facility manager is responsible for verifying and approving the receipts and cash on hand each month and must complete a petty cash reimbursement form at appropriate times each month to ensure availability of funds.

B. The Main Office accounting staff will verify the accuracy of the Petty Cash Reimbursement form and forward to management for final review, verification of the validity of the Petty Cash disbursements, and approval of the A/P Voucher.

Once approved, the A/P voucher is submitted to the Main Office accounting staff for processing. The Facility Petty Cash Fund is coded as an Asset on the G/L.

Article VII. Facility Cleaning and Maintenance

Maintenance personnel are scheduled on-site from 6am – 9:00pm, Monday-Friday to ensure facility cleanliness and proper equipment operation. Focus is on high-traffic areas such entrances, exits, elevator lobbies and drive isles. Debris is removed, trash receptacles emptied and access control equipment wiped down daily. Garage detailing is described below.

7.01 Cleaning Overview

Daily sweeping of the slabs, trash removal, grease and oil cleanup, and slab wash downs are the prime focus of facility cleaning routine. In order to maintain product warranties for the membrane, sealant, and expansion joints within the facility E-Z Parking strives to keep the garage in a clean, safe condition.

A. ***Debris and trash***

1) Although not directly a cause of deterioration, trash and debris do detract from the appearance of the facility and leave users with a negative and sometimes less secure feeling within the facility.

2) If not removed, debris will eventually end up in floor drains and drain lines and cause slow or blocked drainage. Stones, glass, and miscellaneous debris trapped against the expansion joint gland may also puncture the gland during the repeated pounding of tire action and/or the continued expansion and contraction of the gland with seasonal structural movement.

3) The expansion joints are swept weekly and washed out quarterly.

B. ***Sweeping***

Sweeping in the facility is schedule two times per week so that the each floor is swept one time per month.

C. ***Grease and oil spots***

1) In parking stalls, drive lanes and entry/exit locations are check and removed weekly. Larger spots are removed when found and a general cleanup of all spots is performed twice a year (April and October).

2) Failure to remove grease and oil spots will prevent penetration of protective deck sealers when they must be reapplied for continued protection against water and salt penetration.

7.02 Maintenance Overview

A. ***Doors and Hardware***

1) Maintenance schedules are designed to review all facility doors for signs of corrosion or water damage weekly.

2) All door hardware is reviewed weekly to assure proper operation.

3) When a malfunction door is identified it is corrected immediately to maintain the safety and security of the garage.

4) Lubrication of doors and related hardware is performed according to manufacturer's recommendations or at least semi-annually.

B. ***Lighting Systems***

Failure of lighting system components may result in poor illumination in areas of the facility.

1) Daily inspection of lamps, ballasts, electrical conduit, light fixture attachments and distribution panels, help ensure adequate illumination within the facility.

2) Defective lamps are replaced when identified.

3) Electrical conduit and distribution panels are inspected to determine if they are functioning properly.

   a) Water found leaking into the conduit or panel is to be documented and repaired.

   b) Cleaning and repainting of metal items or replacement and repair to reduce leaking is performed as needed.

4) Lumen depreciation may occur due to dirt and dust accumulating both inside and outside of the light fixture. Semi-annual cleaning of light fixtures helps maintain effective and efficient illuminance.

5) A decal is placed on the inside of each fixture to record lamp replacement dates as well as periodic cleaning.

C. ***Facility Elevators***

1) Inspection of elevator shaft and associated hardware is completed monthly.

2) Service of elevator shaft and cab are done according to equipment manufacturer's recommendations.

3) A maintenance agreement with the elevator manufacturer is in place for scheduled maintenance activities.

D. ***HVAC***

1) HVAC systems in the security office and cashier booths are inspected monthly and air filters changed monthly.

2) Service manuals provided by the manufacturer kept on-site for reference on proper maintenance action.

3) Ventilation and exhaust fans are inspected monthly. Replacement belts and pulleys for fans are in stock.

E. ***Painting***

1) Items such as handrails, light poles, precast steel connections, parking equipment, hollow metal doors and doorframes, mechanical lines and bollards are inspected weekly noting any paint chipping and corrosion of the underlying metal.

2) Areas in need of service are handled as follows:

   a) Rusting areas are properly prepared by removing all rust down to bare, near white metal.

   b) These items are primed and repainted.

3) Facility curbs are inspected daily and repainted off-peak hours once per month.

F. ***Parking Control Equipment***

1) Parking control equipment consists of ticket issuing machines, cashier booths, mechanical gates, and revenue control equipment. These items should are inspected for cleanliness, damage, corrosion, and performance several times per day.

2) Lubrication of all moving parts within the parking control equipment is performed monthly as a preventive maintenance activity to minimize down time of equipment.

G. ***Plumbing Systems***

The parking structure plumbing system design consists of floor drains and drain risers.

1) Floor drains and downspout are inspected weekly to assure proper drainage and the rapid disposal of water.

a) Sediment is removed from the drain system when identified.

b) During the wash-down procedures temporary filters, such as burlap are installed over the drains to minimize debris and sediment collection in the drainage system.

2) All piping and fittings are checked for damage, leaks and corrosion on a weekly basis. Damaged components are immediately repaired or replaced when identified.

7.03 Snow and Ice Control

Snow removal is accomplished by the use of hand shovels and snow blowers and is scheduled when pedestrian and vehicular traffic is at a minimum.

Article VIII. Customer Services

8.01 Security Escorts

A. Transient and monthly customers are offered escorts from the facility parking office to their vehicle upon request.

B. Parkers can request escorts from the parking office between 7am –9pm, Monday-Friday.

C. Customers needing assistance outside of these hours are asked to proceed to any facility intercom station for further information and assistance

D. E-Z Parking supervisor, manager or escort staff will obey all facility safety requirements while transporting individuals.

Safe, courteous transportation is the goal and all reports of excessive speed, illegal turns or reckless driving are recorded in the employee's personnel file and the employee counseled on the appropriate operation and execution of this service. Additional infractions result in driving restrictions for the employee at the discretion of the facility manager.

8.02 Vehicle Lock-Out Assistance

A. A list of third-party firms is available to assist customers who require lockout assistance. Any prevailing fee offered for this service is the responsibility of the vehicle owner.

B. Facility managers or supervisors coordinate any request for customer vehicle lockout service. Customers are asked to proceed to the parking office between the hours of 7:00 a.m. – 9:00 p.m., Monday through Friday to request this service.

C. Customers needing assistance outside of these hours are asked to proceed to any facility intercom station for further information and assistance

8.03 Dead Battery Assistance

A. Customers in need of vehicle jump starting can request service from the parking office between the hours of 7:00 a.m. – 9:00 p.m., Monday through Friday.

B. Customers needing assistance outside of these hours are asked to proceed to any facility intercom station for further information and assistance.

C. Facility managers or supervisors are to contact any available staff member to proceed to the office and escort the customer on the facility courtesy cart to the vehicle in need of service with the onsite battery charger.

8.04 Vehicle Location Assistance

A. Customers who are unable to locate their vehicle can request aid from the parking office between the hours of 7:00 a.m. – 9:00 p.m., Monday through Friday.

B. Customers needing assistance outside of these hours are asked to proceed to any facility intercom station for further information and assistance.

C. Facility managers or supervisors are to contact any available staff member to proceed to the office and escort the customer on the courtesy cart throughout the facility to locate their vehicle.

8.05 Flat Tire Assistance

A. Customers with vehicle flat tires can request aid from the parking office between the hours of 7:00 a.m. – 9:00 p.m., Monday through Friday.

B. Customers needing assistance outside of these hours are asked to proceed to any facility intercom station for further information and assistance.

C. Facility managers or supervisors are to contact any available staff member to proceed to the office and escort the customer on the courtesy cart to the vehicle and inflate the disable tire with the on-site air compressor.

Article IX. Facility Emergency Procedures

The emergency procedures for the Gateway Village parking facility are designed to help E-Z Parking employees handle emergency situations. All employees are required to read and understand the

procedures outlined in this section. In the event of an emergency it can serve as a quick reference for effective action.

9.01 Bomb Threats

A. Bomb threats usually occur by telephone. Try to keep the caller on the telephone line as long as possible.

B. The employee receiving the bomb threat call should remain calm and attempt to obtain as much information as possible from the caller by using the bomb threat checklist.

C. Immediately report all bomb threats to the Charlotte-Mecklenburg Police Department (CMPD) at 911; giving your name, location, and telephone number. Inform the 911 dispatcher of the situation, including any information such as location of the bomb, the time it is set to detonate and the time you received the call.

D. Inform your supervisor or the Facility Manager.

E. If you see a suspicious object, package, etc., report it to CMPD and your supervisor or the Facility Manager but DO NOT touch it, tamper with it or try to move it in any way.

9.02 Crime in Progress

A. Do not attempt to approach or interfere with the criminal except in the case of self-protection.

B. If safe to do so, stop and take the time to get a good description of the criminal. Note the height, weight sex, race, approximate age, clothing, method and direction of travel.

C. Immediately call the Charlotte-Mecklenburg Police Department at 911. Give your name, location and telephone number.

9.03 Fire

A. Upon discovering a fire, immediately sound the facility fire alarm and alert the facility manager or supervisor.

B. If the fire is small, you may fight it with a fire extinguisher from a safe position.

C. If the fire cannot be extinguished easily, call 911, giving your name, location and phone number.

D. If the fire is very large, very smoky or spreading rapidly, evacuate the facility immediately. Inform all persons in the facility who may not have responded to the alarm to evacuate immediately.

E. When you evacuate, do not stop for personal belongings or records. Leave immediately using the nearest exit stairways, not the elevators.

9.04 Hazardous Spills and Gas Leaks

Hazardous spills may be of a chemical, radioactive, or biological nature, If the identity of the chemical spill is unknown, treat it as toxic material and do not attempt to clean up the material.

A. If deemed necessary, call 911, giving your name, location and telephone number.

B. Notify the facility manager or supervisor immediately.

C. Do not walk or stand in any spill area.

Article X. Sample Reports

10.01 McGann Card Access System

A. Count Totals Report Sample
B. Entry/Exit Time Report Sample
C. Last Activity Report Sample
D. Card Status Report Sample
E. Card Activity Report Sample
F. Cardholder Report Sample
G. Reader Performance Report Sample

10.02 Garage Accounting System (GAS)

A. Aged Receivables Listing Report Sample
B. Deleted Card Register Report Sample
C. Payment History Report Sample
D. Account Listing Report Sample
E. Account Contract Listing Report Sample
F. Auto License Report Sample

10.03 Monthly Management Reports

A. Actual vs. Budget Sample
B. Revenue Summary Sample
C. Cash Receipts Sample
D. General Ledger Sample

Appendix 18

Parking Requirements Reform White Paper

KIMLEY–HORN

November 2018

PARKING Requirements Reform

A White Paper

Kimley»Horn

Expect More. Experience Better.

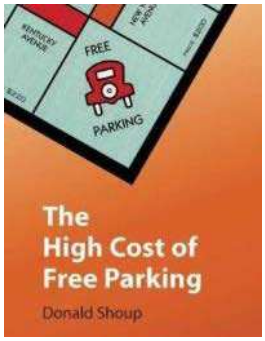
Table of Contents

Introduction

This whitepaper is an excerpt from a review of parking requirements commissioned by the City of Fort Collins as they addressed issues arising from the implementation of a new Bus Rapid Transit (BRT) system. The area in which the BRT would operate was rezoned to create a new Transit Oriented Development (TOD) Overlay Zone. Initially, all minimum parking requirements within the TOD Overlay Zone were eliminated and were replaced by parking maximums. This very progressive policy decision was challenged and revisited once several new student oriented housing developments were constructed with less than anticipated parking in relation the number of bedrooms provided and City Council received complaints from local neighborhood groups fearing parking overflow into their neighborhoods.

This review brought into focus a larger national debate regarding the use of minimum parking requirements. This national discussion is summarized in this paper.

Parking Requirements Reform – The Scholarly Debate



There is in fact a serious and significant national discussion occurring related to benefits and problems associated with the ubiquitous use of minimum parking requirements across the US and the world. Professor Donald Shoup, author of the “High Cost of Free Parking” and a Distinguished Professor of Urban Planning at UCLA, has been led the charge in this area; promoting how better parking policies can improve cities, the economy, and the environment. Shoup recommends that cities should charge fair market prices for on-street parking, use the meter revenue to finance added public services in the metered neighborhoods, and remove off-street parking requirements.

Recently several other noted academicians and planners have weighed in on the discussion of the importance of parking in general, expanding the research related to minimum parking requirements and proposing new options for how Cities should approach these issues. We will focus on three publications in particular. The first is a book entitled “Parking Management” published by Mr. Todd Litman, founder of the Victoria Transport Policy Institute. The second is a recently published book by Richard Willson entitled: “Parking Reform Made Easy”. The third is a book by Eran Ben-Joseph entitled: “Re-Thinking A Lot – The Design and Culture of Parking”.

However, before we launch into that discussion, there is another key issue worthy of exploration – the surprising importance of parking to Transit Oriented Developments.

Parking and Transit Oriented Developments

The following is an excerpt from an article by Mark Gander, Principal Planner; Director of Urban Mobility and Development at AECOM and a member of the Board of Directors for the Green Parking Council.

“There are approximately 250 million registered vehicles (2010) in the United States. When these vehicles are not in use, which accounts for more than 90 percent of their time, they must be parked. Because of this, off-street parking space availability is ubiquitous; its footprint is vast in scale. As MIT Professor of Landscape Architecture and Planning Eran Ben-Joseph recently noted, in some U.S. cities, parking lots cover more than a third of the land area, becoming the single most salient landscape feature of our built environment. This ubiquity is further compounded because cities require parking everywhere, yet ironically its absence is noticed most.”

"The ubiquity of parking is not accidental: Parking matters. It plays an important role in the success of cities, communities and places as well as in the development of mixed-use projects and sustainable transportation. Parking supply and pricing often have a direct impact on the ability to create compact, healthy communities. Too much parking at residential properties correlates with more automobile ownership, more vehicle miles traveled, more congestion, more carbon emissions, and higher housing costs. It also results in lost development opportunity because excess parking area could have been used instead for residential or commercial development or public realm uses such as parks and plazas."

Parking also has both direct and indirect environmental consequences. Direct environmental impacts include excessive land consumption, increased storm water flows, degraded water quality, and exacerbated heat island effects. Additionally, parking structures themselves use substantial amounts of natural resources and energy to construct and require on-going maintenance to operate. In many cases parking structures are seen as unsightly when they are not internalized in mixed-use buildings or wrapped by liner buildings. Parking also indirectly affects the environment because it influences how and where people choose to travel. Where free and ample parking is provided, people make the rational choice to drive almost everywhere — and these areas register more vehicle miles of travel per capita with resulting increases in greenhouse gases and other pollutants.

Striking a balance between parking supply and development is a crucial challenge in developing the character of transit-oriented development (TOD). Residents in TOD projects are twice as likely not to own a car as other US households. They're also two to five times more likely to commute by transit than others in the region. On the other hand, residents will need access to cars even if not on a daily basis and commercial establishments require some amount of parking to service their non-walking clientele. In many cases, developers will be unable to secure financing unless parking is provided.

Unfortunately, many communities have simply applied conventional parking ratios to TOD projects. Because such standards have a suburban bias and are based largely on low-density single land uses they limit the expected community benefits of TOD, and possibly, lead to project failure.

- Transit Oriented Development includes four foundational elements:
- Development around transit that is dense and compact, at least relative to its surroundings;
- A rich mix of land uses—housing, work, and other destinations, creating a lively place and balancing peak transit flows;
- A great public realm—sidewalks, plazas, bike paths, a street grid that fits, and buildings that address the street at ground level; and
- A new deal on parking—less of it; shared wherever possible; energy efficient and designed properly.

Right sizing parking for TOD necessitates a multipronged approach to understanding the existing and projected parking utilization and available supply in and around a TOD project area as well as the projected demand for new parking once the project is completed. Conducting a diagnostic parking study that is comprehensive and aligned with mobility choices is essential to this effort. Once the facts about demand, price, utilization, built form/development pattern, and household characteristics are understood, then appropriate strategies can be employed.

Key elements include understanding differences among markets, unbundling or separating the full cost of parking from the associated use, and reducing (or eliminating) minimum parking requirements for certain land uses or certain areas. Understanding the parking uses by market and type then make it possible to look for opportunities for implementation of a wide range of measures from new technology (e.g. smart parking), to specific policies and physical design modification to consolidate and locate parking more efficiently.

To ensure that parking meets the needs of a TOD project, while not impacting TOD's benefits, there are a number of strategies that municipalities can employ working in conjunction with developers to provide the appropriate amount of parking. These strategies can be grouped into several categories, including reduction; demand; design; and pricing. Each of these categories is discussed briefly.

Reduction

Given the research, along with the information developed by a parking supply and demand study, municipalities should make every effort to reduce the parking requirements for TOD projects. Eliminating parking minimums and instead employing parking maximums for TOD projects will help decrease parking oversupply. Similarly, requiring shared parking where multiple developers combine parking needs into one shared parking lot or structure may also help eliminate an oversupply of parking.

Demand

Reducing the need for car travel is critical to decreasing parking demand. Municipalities or developers should consider establishing car sharing programs where multiple users have access to a fleet of cars when they need them. Similarly, municipalities and transit agencies could increase incentives for using public transportation, including providing subsidized transit passes, establishing residential parking programs for adjacent neighborhoods backed by parking enforcement, and constructing bicycle parking facilities.

Design

Designing for pedestrians is an important element to right-sizing parking. This requires reducing or eliminating design elements that hamper pedestrian use such as the number and size of curb cuts. It also requires adding elements that provide for greater pedestrian safety and aesthetic appeal. These elements might include constructing pedestrian walkways separated from parking and roads, wrapping parking behind existing buildings, designing the first level of parking structures to include other uses such as stores and restaurants, and adding public amenities like art space or public plazas which incorporate green infrastructure.

Pricing

Pricing is another strategy that can be used to influence how and where parking is used and located within a transit station area. On-street parking can be priced to encourage availability of on-street spots for preferred populations such as short term customers. In this case, the cost of parking for 15 or 30 minutes near shops located in the transit station area might be minimal while parking prices for more than 30 minutes is set quite high. Another strategy is to price parking to reflect parking desirability, i.e. spaces closest to activity hubs and on-street are priced higher than spaces at the downtown fringe and parking garages.

While increasing transit ridership, walking and biking are essential to establishing sustainable and livable communities, the car will continue as the principle mobility choice for years to come. Given this circumstance, municipalities and developers will have to provide parking for TOD projects and the surrounding area, but should do so in a way that is appropriately sized and located.

A Growing Interest in Parking Requirement Reform

In the graphic below, architect and designer Seth Goodman shows how parking and living spaces compare in major cities across the U.S. A more localized version of this research concentrated on the Northwest US is also available as is research on other land uses compared to parking spaces.

The research that focused on the northwest US challenges the common assumption that smaller cities behave more like suburbs in terms of parking requirements. It's actually a mixed bag. Spokane, Washington and Eugene, Oregon all mimic the requirements of larger cities. Fort Collins is another good example of this. We should not take for granted that a relatively small population (around 200,000 in the city proper) automatically translates to higher parking requirements. These examples demonstrate that cities don't need Manhattan-like conditions to ease up on parking minimums.

In Auckland, New Zealand, their City Council is debating whether to include traditional parking minimum requirements as an element of their Unitary Plan (comparable to City Comprehensive Plans in the US). The ad to the right illustrates how some advocacy groups are trying to influence the debate.

In the following pages we examine the origins of parking requirements, the impediments to change, and how these policies can be reformed.

The Case For and Case against Reforming Parking Requirements

Background on Traditional Minimum Parking Requirements

According to research published by professors Donald Shoup, Richard Willson and others, in many instances, efforts to accommodate parking have overextended actual need. The approach used by many cities to establish minimum parking requirements (typically a generic formula based on satisfying the maximum demand for free parking). Although this practice allows city planners to err on the side of caution, it has some serious drawbacks. In practical terms, this practice increases the cost of development and creates disincentives with respect to smart growth development and redevelopment. In addition, generic parking requirements create excess parking spaces that consume land and resources, encourage automobile use and associated pollution, and degrade water quality. The oversupply of parking is of particular concern for smart growth development in urban areas where the existing parking infrastructure can be better utilized and parking alternatives, such as shared parking and increased use of transit and pedestrian modes, can be more readily implemented.

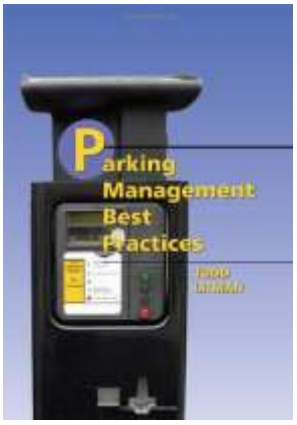
With the shifting trend toward urban revitalization over the past decade, the timing is opportune for instituting changes in parking requirements and transportation behavior. An important way to reduce the demand for parking and the need to supply parking to meet maximum demand is to provide transportation choices. This can be achieved by reducing the supply of parking in areas where transportation choices exist and by providing incentives for making other choices. Such changes will encourage infill redevelopment and reduce vehicle miles traveled, mobile source emissions and congestion. They will also increase ridership for public transit and, in turn, provide the additional revenues needed to support public transit improvements.

There are, of course, potential drawbacks to reducing the supply of parking. Lenders, for example, may be unwilling to approve loans because plans do not meet their minimum parking requirements; developers may be concerned about the long-term marketability of their property; and residents may fear that parking will spill over into surrounding residential neighborhoods. Such concerns can be more readily addressed if:

- The factors that affect parking demand are understood;
- Walkable, pedestrian-oriented development design is implemented; and
- Viable transportation choices exist.

Concerns are also alleviated when developers, employers, and employees are aware of programs that balance the attractiveness of other transportation choices. The Transportation Equity Act for the 21st Century (TEA-21), for example, allows businesses to give their employees up to $100 per month in tax free transit subsidies. TEA-21 also allows employees who commute by public transit or vanpool to deduct the cost of commuting from their taxable income if they do not receive a subsidy.

Establishing Parking Requirements



On the Victoria Transport Policy Institute (VTPI) website and in his book on Parking Management, noted planner and transportation consultant Todd Litman does a good job of laying out the traditional approach to establishing parking requirements and makes a strong case for the use of more flexible and localized criteria in creating zoning codes especially as it relates to parking requirements.

In setting parking requirements, planners typically use generic standards that apply to general land use categories (e.g., residential, office, retail). Such standards have been developed and published by professional organizations, including the Institute of Transportation Engineers (ITE), based on experience in many locations. Much of the data on which these standards are based comes from low-density, single-use developments with limited transportation choices. Therefore, the generic parking rates cannot take into account the mix of context-sensitive, community specific variables - density, demographics, availability of transportation choices, or the surrounding land-use mix - all of which influence the demand for parking and should be reflected in parking requirements. Instead, requirements are based on the maximum demand for parking, when parking is provided at no charge to users, and walking, biking, and transit are not available choices. This formula yields a surplus of parking that is costly for developers to provide, and it subsidizes personal automobile use and encourages auto use even in areas where convenient transportation choices exist. Because of the way in which they are typically established, parking requirements are remarkably consistent across different cities, despite varying levels of economic vitality, population size, and development density.

Alternatively, parking requirements can be established using methods that are better tailored to specific development projects. This approach entails careful consideration of the following land use characteristics that relate to parking demand:

- Development type and size.
  - Takes into account the specific characteristics of the project.
  - Parking demand is influenced by the size of the development (typically measured by total building square footage), as well as the type of land use (e.g., retail, industrial). Generic parking formulas address these factors to some extent.

- Population and development density.
  - Considers the density and demographic characteristics of the people using the building, including employees, customers, residents, and visitors. Information on income, car ownership, and age distribution also helps in projecting total parking demand.
- Availability of transportation choices.
  - Takes into account the modes of transportation available to employees, visitors, and residents. Proximity of public transportation to a particular development, for example, will reduce parking demand.
  - Walkable neighborhoods and bicycle amenities will also reduce parking demand.
- Surrounding land use mix.
  - Considers the surrounding land uses and density to better understand parking needs, and evaluates whether overall peak demand is lower than the sum of peak demands for different uses. This concept takes the timing of parking demand into account in determining the aggregate demand of multiple uses.
  - The type of community in which a development is located will also affect parking demand. For example, if a project is located in a city's central business district, the availability of general use parking will reduce onsite parking demand. On the other hand, if the development is located in a residential area, on-street parking may be unacceptable to local residents, increasing the need for off-street parking at the development.

Land use and demographic information are important tools for establishing project-specific parking requirements that create a better match of supply and demand for parking than do many generic requirements.

Moreover, adjusting parking requirements downward to reflect realistic demand helps reduce the total cost of development, particularly in urban areas. By reducing cost, a potential deterrent to smart growth development and redevelopment can be removed.

The following table from the VTPI website summarizes a wide range of parking management strategies and indicates typical reductions in the amount of parking required at a destination, and whether a strategy helps reduce vehicular traffic, therefore providing congestion, accident and pollution reduction benefits.

Strategy	Description	Typical Reduction	Traffic Reduction
Shared Parking	Parking spaces serve multiple users and destinations.	10-30%	
Parking Regulations	Regulations favor higher-value uses such as service vehicles, deliveries, customers, quick errands, and people with special needs.	10-30%	
More Accurate and Flexible Standards	Adjust parking standards to more accurately reflect demand in a particular situation.	10-30%	
Parking Maximums	Establish maximum parking standards.	10-30%	
Remote Parking	Provide off-site or urban fringe parking facilities.	10-30%	
Smart Growth	Encourage more compact, mixed, multi-modal development to allow more parking sharing and use of alternative modes.	10-30%	X
Walking and Cycling Improvements	Improve walking and cycling conditions to expand the range of destinations serviced by a parking facility.	5-15%	X
Increase Capacity of Existing Facilities	Increase parking supply by using otherwise wasted space, smaller stalls, car stackers and valet parking.	5-15%	X
Mobility Management	Encourage more efficient travel patterns, including changes in mode, timing, destination and vehicle trip frequency.	10-30%	X
Parking Pricing	Charge motorists directly and efficiently for using parking facilities.	10-30%	X
Improve Pricing Methods	Use better charging techniques to make pricing more convenient and cost effective.	Varies	X
Financial Incentives	Provide financial incentives to shift mode, such as cash out.	10-30%	X
Unbundle Parking	Rent or sell parking facilities separately from building space.	10-30%	X
Parking Tax Reform	Change tax policies to support parking management objectives.	5-15%	X
Bicycle Facilities	Provide bicycle storage and changing facilities.	5-15%	X
Improve User Information and Marketing	Provide convenient and accurate information on parking availability and price, using maps, signs, brochures and electronic communication.	5-15%	X
Improve Enforcement	Insure that parking regulation enforcement is efficient, considerate and fair.	Varies	
Transportation Management Associations	Establish member-controlled organizations that provide transport and parking management services in a particular area.	Varies	X
Overflow Parking Plans	Establish plans to manage occasional peak parking demands.	Varies	
Address Spillover Problems	Use management, enforcement and pricing to address spillover problems.	Varies	
Parking Facility Design and Operation	Improve parking facility design and operations to help solve problems and support parking management.	Varies	

Environmental Impacts of Parking

The significant environmental costs associated with parking are not typically factored into development decisions, and only recently have begun to be considered in setting parking requirements. Construction of unnecessary impervious surfaces increases the impacts of storm water runoff, either on the storm sewer system or the surrounding land. Paved surfaces can also result in water pollution and flooding, resulting in a decline in adjacent property values. Heat islands, or areas of artificially raised temperatures, also are exacerbated by unnecessary pavement.

Consuming land for parking also reduces the land available for green space or other, more productive development. Land preserved as part of the green infrastructure allows storm water to percolate into the soil, provides wildlife habitat, provides air quality and noise reduction benefits, and is aesthetically desirable. Land developed for living, working, and shopping rather than just parking provides more intensive use. This lowers the demand to develop other land nearby or elsewhere in the region. Intensifying uses also creates a more supportive environment for transit and walking, and potentially for bicycling as well.

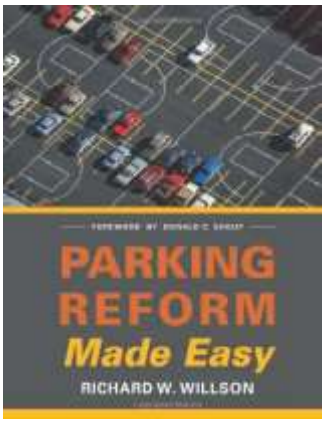
Providing more parking than demanded, and at artificially low prices, contributes to several harmful environmental impacts. First, this subsidy of automobile use leads directly to excess driving. This results in increased auto dependency and air pollution, accidents, and congestion. Second, it indirectly degrades the attractiveness of walking and biking, by increasing distances between activities and creating uninteresting routes.

Third, it indirectly undermines the potential for transit service by decreasing the density potential of development projects.

All of these environmental costs tend to be greater for parking built in green field areas where there is more inexpensive but ecologically-sensitive open space available and where development densities are lower thus requiring more and longer automobile trips. Because these environmental costs are not realized by developers, they do not influence development decisions which are driven primarily by the direct financial costs that are typically lower in green field areas.

Parking Requirement Reform

The following is an excerpt from the book "Parking Reform Made Easy" by Richard Wilson. Richard W. Willson, Ph.D., FAICP, is Professor and Chair in the Department of Urban and Regional Planning at California State Polytechnic University, Pomona.



Parking requirements in zoning ordinances create one of the most wasteful elements of transportation and land use systems: unoccupied parking spaces. Each space requires over 300 square feet of valuable land or building area, yet many sit empty. Minimum parking requirements at shopping malls, for example, often lead to sprawling developments surrounded by large, underused parking lots. Spaces for workplaces may be well-used during the day but remain unoccupied in the evening because they are not shared with other land uses.

Sometimes, the parking required is greater than the amount of parking ever used. Parking is overbuilt and underutilized for two reasons: 1) zoning requires an excessive parking supply, and 2) it prevents efficient sharing of parking among different land uses. Both reasons reflect a legacy of single-use zoning and an automobile-first approach to planning. Minimum parking requirements prevent private developers from responding to market conditions, and lessen developers' interest in sharing parking or developing sites that are accessible without driving. Planners sometimes claim that developers would build the same amount of parking regardless of regulations, but if that's true, then why impose minimum parking requirements in the first place?

Parking requirements should be framed as a means of providing access, not an end. Parking requirements are only one of several ways to ensure storage for private automobiles. Private auto transportation, in turn, is only one of several ways to provide access. To carry out parking reform, we must counteract the decades-old practice of thinking about access in terms of roadways and parking.

Why Parking Requirements?

Early zoning ordinances did not have parking requirements. Zoning sought to manage the external impacts of properties, such as when a new building represented a fire hazard to the structure next door.

In the mid-20th century, parking requirements were added to address surface street congestion caused by patrons driving in search of parking. Planners didn't foresee that minimum parking requirements would favor private vehicle travel, lower overall density, and increase traffic.

In surveys conducted in 1995 and again in 2013, local planners in southern California were asked about parking requirements and found a repetitious justification for minimum parking requirements: planners wished to "ensure an adequate number of parking spaces." This response reflects a lack of critical thinking about fundamental public objectives, such as accessibility, economic development, and sustainability. The response also reflects an outdated vision of separated land uses, unrestricted auto-mobility, and plentiful free parking. Thus, many parking requirements are relics that undermine current land use and transportation goals.

The following tables from Richard Willson's book summarize the cases both for and against minimum parking requirements.

The Case FOR Parking Minimum Requirements

- Reduce street congestion around the development site
- Avoid parking spillover
- Create orderly development patterns
- Anticipate possible intensification or changes in the use of a development
- Create a level playing field among developers
- Encourage growth of core areas by increasing parking supply in those areas
- Reduce parking management by making the adjudication of conflicts between property owners unnecessary
- Reduce the demand for public provision of parking

The Case AGAINST Parking Minimum Requirements

- Encourages private vehicle usage and lengthens trips
- Adversely impacts transit and alternative modes
- Reduces development density
- Creates inhospitable project design
- Thwarts development and economic activity (little or no direct revenue)
- Makes construction of affordable housing more challenging
- Hampers investment in infill development and adaptive reuse in core areas
- Directly and indirectly harms the environment
- Lowers physical activity with consequences for public health
- Imprecisely represents actual parking utilization levels (parking utilization ratios typically are not based on local empirical evidence)

Why Change Is Difficult

Some regional and state policymakers recognize that existing parking requirements are excessive, but most have neglected the issue because parking is a responsibility of local governments. Yet parking requirements are crucial to accomplishing federal, state, and regional objectives in transportation, land use, and the environment. There are recent indications that if local governments do not carry out reforms, states may do it for them. In 2012, a proposal in the California legislature (AB 904) sought to override local parking requirements in transit-rich areas. Legislators subsequently tabled the proposal, however, showing the power of local governments to resist state interference in parking policies.

Many local planners know the parking requirement status quo is wrong. They have observed wasted land, turned away restaurant proposals in historic districts, and seen affordable housing not pencil out. Despite these undesirable outcomes, planners have not made changes. Why? Some may feel powerless to change ossified regulations, sensing weak political support and lacking technical expertise to justify changes. Others may want the negotiating leverage that excessive parking requirements provide to extract public benefits from developers. Furthermore, planners know that parking is a key point in NIMBY (not-in-my-back-yard) resistance to development, so avoiding parking controversy can help ensure economic development. In effect, cities are addicted to parking requirements. The addiction is analogous to smoking, where immediate gratification overwhelms future costs.

Change means freeing ourselves of parking dogma, habits, and golden rules. The old reality dictated fixed parking requirement ratios and exhibited an unwillingness to deviate from standard practice, even when it made sense to do so. This approach emphasized precision and uniformity. It undervalues important considerations of local variability, policy relationships, environmental capacity, and human behavior. All the land-use plans, design reviews, and streetscape renderings in the world will not produce desired outcomes if we do not reform parking requirements.

It is important to note that this reticence to address the negative impacts of minimum parking requirements has not been the issue in the City of Fort Collins, which is known for its progressive planning and sustainability policies. However, the fact that this study was commissioned is a testament to the complexity and sensitivities that these complex and interrelated policy issues generate. In particular, a key issue in this study has to do with timing. With the investment in the Mason Corridor transit planning and the new MAX Bus Rapid Transit line, a Transit Overlay District was created in the City. Zoning codes (including parking requirements) were adjusted to reflect the different transportation dynamics of the corridor as well as a vision for increased development density and enhanced transit neighborhood urban design characteristics. However, these zoning changes preceded the actual implementation of the MAX BRT. As a result, new development projects have proceeded under the revised zoning conditions of the TOD Overlay Zoning district without the benefit of having the transit component in place.

The development of the Summit project in particular (a fairly large student housing development near the CSU campus), which planned to provide 676 bedrooms with only 217 parking spaces (471 spaces would have been required in the development had been outside the TOD Overlay Zone – a difference of -254 spaces or -54% of the standard parking requirement)caused a rethinking of the policy to not to require minimum parking requirements for multi-family development within the TOD Overlay Zone and a temporary reinstatement of minimum parking requirements, on an adjusted basis, while the policy could be further examined. This policy adjust will sunset in September 2014 when recommendations from this study will be used to reassess both TOD zoning policies and parking policies on a more comprehensive basis.

Why Not Eliminate Parking Requirements?

According to national experts, deregulating off-street parking allows markets to determine parking supply levels and provokes a fresh debate about justifications for public regulations and subsidies for all transportation modes. Currently, minimum requirements compel the provision of access for driving and parking, whereas zoning codes seldom impose equivalent requirements for bus, bicycle, or pedestrian facilities. When they do, those requirements have been added more recently and are at a lower investment level.

Under minimum requirements, even those who do not drive share in paying the cost of parking. Parking costs are embedded in higher retail prices, lower workplace salaries, higher rents, and the like. In these ways, most minimum requirements tend to prioritize private vehicles. Eliminating minimum requirements would begin to level the playing field for all travel modes.

Cities such as Philadelphia, Portland, and Seattle have recently reformed their parking requirements and adopted limited deregulation. Deregulation shifts the approach from automatically requiring parking to not supplying it until it is economically justified. It is a big change from standard practice and should be coupled with programs for shared parking and advanced parking management. Still, the idea of eliminating minimum parking requirements hasn't gained traction in many places. Local officials are often buffeted by demands from residents, storeowners, and employees for more parking, not less.

City staff researched TOD parking requirements in several other communities including the following:

- Denver Zoning Code: Maximum number of spaces shall not exceed 110% of the minimum parking spaces required by context-specific ratios (Denver's method of calculating parking requirements everywhere). Parking in structures doesn't count toward the maximums.

- Aurora TOD Zoning Sub-District: Minimum 0.5 – 1.0 space per multi-family dwelling unit depending on proximity to a transit station compared to 1.0 – 2.5 spaces per unit depending on number of bedrooms outside TOD.
- Lakewood Transit Mixed Use Zone District: Minimum 1 space per unit, maximum 2 spaces per unit. Parking in structures doesn't count toward the maximums. The parking requirements may be met on-site or off-site at a distance of up to 600 feet from the use.
- Eugene, Oregon: Establishes parking exempt areas not subject to minimums including Downtown and a couple other areas.
- Metro Portland recommends three actions when the parking ratio is below 1.0 space/unit:
  - Charge for all covered parking
  - Add car-share in the area
  - Provide first rate bicycle facilities (lockers, wash areas, secured bike parking, etc.)

Examples of progressive parking requirements from additional communities are reviewed later in this report (See Peer Cities section).

Developers Responses to Different Approaches to Parking Requirements

Approaches to parking reform vary from community to community. Accordingly, the table below shows the range of reform options, including the traditional approach in which the minimum requirements exceed expected use. At the other end of the spectrum is deregulation, with no minimum or maximum parking requirements. In many cities and towns, the best approach is somewhere in between, with deregulation in central business districts and transit-oriented developments, and reduced minimum requirements in other areas.

Approach	Minimum Requirement	Maximum Requirement	Developer Response
Traditional	>Utilization	None	Rarely builds more than the requirement
Moderate Reform	=Utilization	None	Assesses market for project, may exceed the minimum
Big City Approach	<Utilization	A fixed ration or percentage minimum	Makes market decision whether to supply the minimum or build to the maximum
Partial Deregulation	None	A fixed ratio	Makes market decision whether to supply any parking or build to the maximum
Deregulation	None	None	Makes the market decision whether/how much to build

In Praise of Incrementalism

According to Richard Willson, in the past decade, many cities initiated comprehensive zoning code reform, and others are planning such efforts. Comprehensive reform efforts allow planners to rethink parking requirements while they consider the basic organization and functioning of the zoning code. These efforts also allow planners to bypass the complexity of older codes that have undergone countless revisions. Ideally, planners will amass enough political clout and financial resources before undertaking the daunting task of comprehensive zoning code revision.

There are many situations, however, where financial resources and political capital are not sufficient for comprehensive parking reform. In these cases, an incremental approach can produce good results. It makes sense to start where there is support, either from elected officials or from community or district stakeholders. Code reformers can work with these stakeholders and produce parking requirement reforms, parking overlay zones, or partial deregulation without creating opposition that might emerge in a citywide effort.

These early successes often build support for larger, more comprehensive efforts. Rather than viewing pilot projects or experiments as somehow inferior to comprehensive parking reform, we should see them as effective ways of producing valuable information, testing innovative ideas, and ultimately generating change.

Rethinking Parking – Another Perspective on the Potential of Parking Lots

In his 2012 book entitled "Rethinking a Lot: The Design and Culture of Parking", Eran Ben-Joseph, professor of landscape architecture and urban planning at the Massachusetts Institute of Technology, argues that parking lots are so prevalent in our daily life that we should take them more seriously. There are an estimated 600,000,000 passenger cars in the world, and that number is increasing every day. So too is Earth's supply of parking spaces. In some cities, parking lots cover more than one-third of the metropolitan footprint. It's official: we have paved paradise and put up a parking lot. In ReThinking a Lot, Eran Ben-Joseph shares a different vision for parking's future. Parking lots, he writes, are ripe for transformation. After all, as he points out, their design and function has not been rethought since the 1950s. With this book, Ben-Joseph pushes the parking lot into the twenty-first century.

Can't parking lots be aesthetically pleasing, environmentally and architecturally responsible? Used for something other than car storage? Ben-Joseph shows us that they can. He provides a visual history of this often ignored urban space, introducing us to some of many alternative and non-parking purposes that parking lots have served - from RV campgrounds to stages for "Shakespeare in the Parking Lot." He shows us parking lots that are not concrete wastelands but lushly planted with trees and flowers and beautifully integrated with the rest of the built environment. With purposeful design, Ben-Joseph argues, parking lots could be significant public places, contributing as much to their communities as great boulevards, parks, or plazas. For all the acreage they cover, parking lots have received scant attention. It's time to change that; it's time to rethink the lot.

The parking lot is the antithesis of nature's fields and forests, an ugly reminder of the costs of our automobile-oriented society. But as long as we prefer to get around by car (whether powered by fossil fuel, solar energy or hydrogen), the parking lot is here to stay.

It's hard to imagine an alternative. Or is it? I believe that the modern surface parking lot is ripe for transformation. Few of us spend much time thinking about parking beyond availability and convenience. But parking lots are, in fact, much more than spots to temporarily store cars: they are public spaces that have major impacts on the design of our cities and suburbs, on the natural environment and on the rhythms of daily life. We need to redefine what we mean by "parking lot" to include something that not only allows a driver to park his car, but also offers a variety of other public uses, mitigates its effect on the environment and gives greater consideration to aesthetics and architectural context.

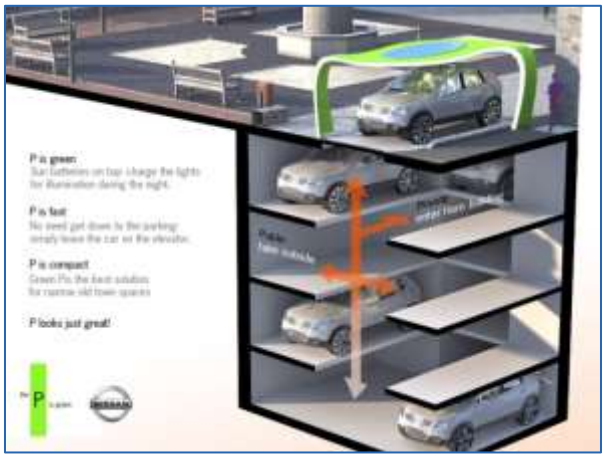
It's estimated that there are three nonresidential parking spaces for every car in the United States. That adds up to almost 800 million parking spaces, covering about 4,360 square miles — an area larger than Puerto Rico. In some cities, like Orlando and Los Angeles, parking lots are estimated to cover at least one-third of the land area, making them one of the most salient landscape features of the built world.

Such coverage comes with environmental costs. The large, impervious surfaces of parking lots increase storm-water runoff, which damages watersheds. The exposed pavement increases the heat-island effect, by which urban regions are made warmer than surrounding rural areas. Since cars are immobile 95 percent of the time, you could plausibly argue that a Prius and a Hummer have much the same environmental impact: both occupy the same 9-by-18-foot rectangle of paved space.

A better parking lot might be covered with solar canopies so that it could produce energy while lowering heat. Or perhaps it would be surfaced with a permeable material like porous asphalt and planted with trees in rows like an apple orchard, so that it could sequester carbon and clean contaminated runoff.

The ubiquity of parking lots has also led to an overlooked social dimension: In the United States, parking lots may be the most regularly used outdoor space. They are public places that people interact with and use on a daily basis, whether working, shopping, running errands, eating, even walking — parking lots are one of the few places where cars and pedestrians coexist.

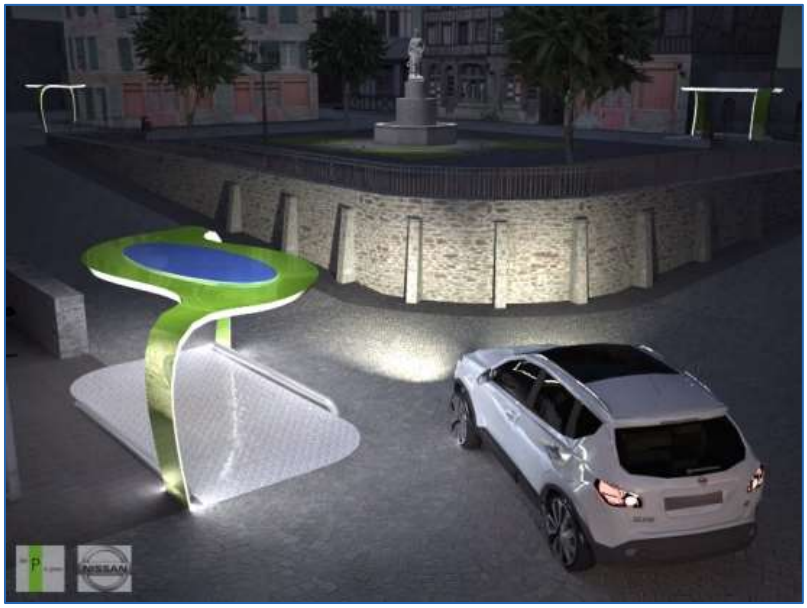
Better parking lots would embrace and expand this role. Already, many lots provide space for farmers' markets, spontaneous games of street hockey, tailgating, even teenagers' illicit nighttime parties. This range of activities suggests that parking lots are a "found" place: they satisfy needs that are not yet met by our designed surroundings. Planned with greater intent, parking lots could actually become significant public spaces, contributing as much to their communities as great boulevards, parks or plazas. For instance, the Italian architect Renzo Piano, when redesigning the Fiat Lingotto factory in Turin, eliminated the parking lot's islands and curbs and planted rows of trees in a dense grid, creating an open, level space under a soft canopy of foliage that welcomes pedestrians as naturally as it does cars.



The parking lot also has an underutilized architectural function. A parking lot is the first part of a space you visit or live next to. It is typically the gateway through which dwellers, customers, visitors or employees pass before they enter a building. Architects and designers often discuss the importance of “the approach” as establishing the tone for a place, as the setting for the architecture itself. Developers talk about the importance of “first impressions” to the overall atmosphere conveyed to the user.

Yet parking lots are rarely designed with this function in mind. When they are, the effect is stunning. For instance, the parking lot at the Dia art museum in Beacon, N.Y., created by the artist Robert Irwin and the architecture firm OpenOffice, was planned as an integral element of the visitor’s arrival experience, with an aesthetically deft progression from the entry road to the parking lot to an allée that leads to the museum’s lobby.

For something that occupies such a vast amount of land and is used on a daily basis by so many people, the parking lot should receive more attention than it has. We need to ask: what can a parking lot be?



In Summary

The strategies and policy considerations discussed above are alternatives to setting a parking requirement based on a neighboring city's requirement or a national average. Fort Collins has long moved beyond most communities in this regard, however through this study we will be evaluating options to reassess parking requirements based on specific land use categories (for example applying differing standards to "student housing oriented projects" compared to other multi-family housing developments based on the demonstrated differences in parking demand generated by this specific use). We are also assessing varying requirements based on development size or context features, such as transit accessibility, mixed-land uses, shared parking and overall development density. The use of alternative compliance mechanisms that provide more context specific data from which to make rational and measured adjustments to parking requirements are also being assessed.

Parking reform can also be coordinated with regional planning and modeling activities. For example, in King County, Washington, the Metro Transit's web-based GIS tool provides data on parking utilization for multi-family housing and tests alternative parking ratios in terms of costs and impacts.

Note: More information about King County, Washington's King County Multi-Family Residential Parking Calculator can be found at http://www.rightsizeparking.org/.

In the case of Fort Collins, the use of the "Park+" parking demand modelling software that has been purchased by both the City and CSU could provide a similar analysis tool.

Best Practices Review

This section of the parking study summarizes some of the parking best management practices that are recommended and/or have been successfully implemented in other communities. These practices are tools to address existing parking issues and accommodate future demand. It is important to remember that these strategies are not mutually exclusive and may need to be modified to suit the needs of the City of Fort Collins. Many of these strategies are complementary and are most effective when used in conjunction with one another.

Innovative Alternatives or Supplements to Minimum Parking Requirements

Some local governments have implemented alternatives to generic parking requirements that increase availability from existing supply, reduce the demand for parking, or create more cost-effective and environmentally sensitive parking structures that preserve pervious surfaces. By lowering total development costs, some of these parking alternatives have consequently encouraged smart growth development and redevelopment. This section summarizes proven alternatives and includes discussion of their establishment, advantages, and potential concerns. The alternatives are organized according to their influence on parking supply, parking demand and pricing.

Increasing Availability From Existing Supply Or Limited Expansion

Frequently, the supply of parking in developed areas is sufficient to meet parking demand, but a combination of reasons limit the availability of that supply.

Context-specific Minimum Requirements

As discussed in the Introduction, generic minimum requirements are typically set based on maximum observed demand for free parking in areas with no transportation choices. However, parking demand is determined by a range of factors that lead to significant variations within and across jurisdictions, meaning that a single standard for each land use may not be appropriate. Other factors that are strongly correlated with lower vehicle ownership in urban areas are frequent transit service, small household sizes, low incomes, a high proportion of seniors, and rental housing.

Similarly, at commercial developments, transit access, mix of uses, and density are good predictors of parking demand. Often developers are interested in finding ways to reduce the vehicle trip generation calculations for their expected development, so that they can demonstrate fewer impacts on the surrounding roadway network, while they may not always be so eager to reduce the amount of parking to supply.

A major challenge for cities is how to convert this research and data, together with experience from other settings, into local parking requirements or planning approvals for specific developments. Some of the mechanisms being used are:

- Transit Zoning Overlays
- New Zoning Districts or Specific Plans
- Parking Freezes
- Reductions for Affordable and Senior Housing
- Case-By-Case Evaluation
- Land Banking and Landscape Reserves

Maximum Limits and Transferable Parking Entitlements

In contrast to generic minimum parking requirements, maximum limits restrict the total number of spaces that can be constructed rather than establish a minimum number that must be provided. Planners set maximum limits much like they set minimum requirements. Typically, a maximum number of spaces is based on square footage of a specific land use. For example, the City of Portland, Oregon restricts offices in the central business district to 0.7 parking spaces per 1,000 square feet, and retail to 1.0 space per 1,000 square feet of net building area. Contrary to what might be expected, the maximum limits in Portland have not led to a parking shortage because of the balance of transportation choices available.

Maximum requirements are not ideal for all locations. It is crucial for municipalities that employ maximum requirements to have accompanying accessible and frequent public transportation. It is also important for the area to be sufficiently stable economically to attract tenants without needing to provide a surplus of parking. A number of cities have implemented maximum parking requirements, including San Francisco, California; Portland, Oregon; and Seattle, Washington.

Shared Parking

Different types of land uses attract customers, workers, and visitors during different times of the day. Shared parking is another alternative that city planners can employ when setting parking requirements in mixed-use areas. An office that has peak parking demand during the daytime hours, for example, can share the same pool of parking spaces with a restaurant whose demand peaks in the evening. This alternative also reduces overall development costs.

By allowing for and encouraging shared parking, planners can decrease the total number of spaces required for mixed-use developments or single-use developments in mixed-use areas. Developers benefit, not only from the decreased cost of development, but also from the "captive markets" stemming from mixed-use development. For example, office employees are a captive market for business lunches at restaurants in mixed-use developments.

Shared parking encourages use of large centralized parking facilities and discourages the development of many small facilities. This results in more efficient traffic flow because there are fewer curb cuts, and turning opportunities on main thoroughfares. This has the added benefits of reducing accidents and reducing emissions from idling vehicles stuck in traffic.

Establishing shared parking requirements involves site-specific assessment or use of time-of-day parking utilization curves. Montgomery County, Maryland allows for shared parking to meet minimum parking requirements when any land or building under the same ownership or under a joint use agreement is used for two or more purposes. The county uses the following method to determine shared requirements for mixed-use developments:

- Determine the minimum amount of parking required for each land use as though it were a separate use, by time period, considering proximity to transit.
- Calculate the total parking required across uses for each time period.
- Set the requirement at the maximum total across time periods.

Many available sources document procedures for calculating shared parking requirements, from 1983's "Flexible Parking Requirements" to 2003's SmartCode.

In-Lieu Parking Fees and Centralized Parking

Municipalities establish in-lieu parking fees as an alternative to requiring on-site parking spaces. With in-lieu fees, developers are able to circumvent constructing parking on-site by paying the city a fee. The city, in return, provides centralized, off-site parking that is available for use by the development's tenants and visitors. The fees are determined by the city and are generally based on the cost of providing parking. Cities set fees in one of two ways, either by calculating a flat fee for parking spaces not provided by a developer on-site or by establishing development-specific fees on a case-by-case basis. Shoup reports that in-lieu fees in the United States range from $5,850 to $20,180 per parking space. These fees can be imposed as a property tax surcharge.

In-lieu parking fees provide advantages to both planners and developers. Allowing developers to pay fees in-lieu of constructing parking has the following benefits:

- Overall construction costs may be reduced;
- Construction of awkward, unattractive on-site parking is avoided;
- Redevelopment projects involving historic buildings can avoid constructing parking that would compromise the character of the buildings;
- Planners can ensure that existing parking facilities will be more fully utilized; and
- Planners can encourage better urban design with continuous storefronts that are uninterrupted by parking lots.

In establishing in-lieu parking fees, planners must be cognizant of potential developers' concerns about the impact of a lack of on-site parking on the attractiveness of developments to tenants and visitors. This can be an issue if available public parking is insufficient, inconveniently located, or inefficiently operated. Planners must carefully consider the parking demand for each participating property and provide enough parking to meet this demand in order to avoid creating a perceived or real parking shortage. Planners must also work to ensure that public parking facilities are centrally located and operated efficiently.

Centralized parking facilities can reduce the costs of parking because large facilities are less expensive on a per space basis to build and maintain than small facilities. Centralized parking, as an alternative to on-site parking, also improves urban design and preserves the historic nature of communities. Some cities mandate centralized parking facilities and finance them through development impact fees in lieu parking fees or negotiated contributions established during the environmental review process.

Increasing Availability by Decreasing Demand

Demand reduction can be achieved through a variety of programs and policies that attempt to reduce the automobile transportation demand, and thus reduce the needed supply of parking. While these programs are typically developed by local governments, their success often depends on the commitment of businesses to implement them effectively.

Demand reduction programs include: car sharing, subsidies for transit, transit improvements, pedestrian and bicycle amenities, and vehicle trip reduction programs. When employers allow telecommuting and/or flexible work schedules that reduce commuting, demand is also reduced.

Car Sharing

Car sharing is a neighborhood-based, short-term vehicle rental service that makes cars available to people on a pay-per-use basis. Members have access to a common fleet of vehicles on an as-needed basis, gaining most of the benefits of a private car without the costs and responsibilities of ownership. In programs with the most advanced technology, members simply reserve a car via telephone or the Internet, walk to the nearest lot, access the car using an electronic card, and drive off. They are billed at the end of the month.

In commercial developments, car-sharing can also be a useful tool to reduce parking demand. Employees can use a shared vehicle for errands and meetings during the day, allowing them to take transit, carpool, walk or bicycle to work. Car-sharing works best in compact, mixed-use neighborhoods, where firms with corporate memberships tend to use the vehicles during the day and residents use them in the evenings and on weekends.

As well as reduced parking demand, car-sharing brings a broad range of other benefits, including fewer vehicle trips, and improved mobility for low-income households who may not be able to afford to own a car. Formal car-sharing programs have been established in many cities including Boston, Massachusetts; Washington, DC; San Francisco, California; Oakland, California; Portland, Oregon; Seattle, Washington; and Boulder, Colorado. Many others are in the process of establishing operations. Alternatively, developers can provide shared vehicles themselves, or facilitate informal car-sharing among residents.

Improvements to Transit Service, Pricing, and Information

Transit subsidies can be provided by employers, by cities, or by residential property managers. In the case of employer-paid transit pass schemes, the employer pays the cost of employees' transit, converting the fixed cost for parking spaces into a variable cost for the public transportation subsidy. This fringe benefit for employees reduces the demand for parking at the workplace, which in turn reduces traffic, air pollution, and energy consumption. It also reduces the cost associated with providing parking, as transit subsidies are generally less expensive than providing parking.

Improvements to Pedestrian and Bicycle Service

Demand for parking can be reduced by providing pedestrian and bicycle amenities that make it easier and more pleasant for people to walk or bicycle rather than drive. These amenities and design changes can alleviate traffic congestion. In particular, improving the walkability and pedestrian orientation of employment centers can address the increasingly common "drive to lunch" syndrome. For example, the auto-orientation of Tyson's Corner, Virginia has resulted in terrible traffic at lunch time because people cannot walk to eating establishments or to do errands.

Vehicle Trip Reduction Programs

Another direct form of demand reduction involves instituting vehicle trip reduction programs. Vehicle trip reduction programs combine several types of demand reduction components to meet explicit vehicle trip reduction goals.

Thus, instead of capping the number of parking spaces, local officials limit the number of vehicle miles traveled in a particular region. These types of programs attempt to decrease the number of trips by single occupancy vehicles (SOVs) and increase the use of a variety of commuting alternatives, including transit, carpooling, walking, and bicycling.

To increase the effectiveness of vehicle trip reduction programs, cities or employers can incorporate an assortment of complementary program elements to balance transportation choices. The following are some examples:

- "Guaranteed ride home" services that allow employees who use public transit to get a free ride home (e.g., via taxi) if they miss their bus or if they need to stay at work late.
- Company fleet cars that can be used for running errands during the workday (e.g., doctor appointments).
- Preferential and/or reserved parking for vanpools/carpools.
- Carpooling and/or vanpooling with ride matching service. Ride matching can facilitate the identification of people who live close to one another. This service can be accomplished by providing "ride boards" or by using an employee transportation coordinator.
- Cellular phones for car and vanpooling to facilitate timing of pickups.

There is little incentive for employers to implement vehicle trip reduction programs if they are not granted reductions in minimum parking requirements. They would not be able to realize the potential cost savings from providing less parking, but would simply be faced with a large number of empty spaces. Several cities, such as South San Francisco, have acknowledged this through ordinances that reduce parking requirements for projects that include vehicle trip reduction programs.

Efficient Pricing

Although it is often provided at no charge to the user, parking is never free. Each space in a parking structure can cost upwards of $2,500 per year in maintenance, operations and the amortization of land and construction costs. Even on-street spaces incur maintenance costs and an opportunity cost in foregone land value. The cost of parking is generally subsumed into lease fees or sale prices for the sake of simplicity and because that is the more traditional practice in real estate. However, providing anything for free or at highly subsidized rates encourages overuse and means that more parking spaces have to be provided to achieve the same rate of availability. Charging users for parking is a market-based approach by which the true cost of parking can be passed through to parking users. If the fee charged to users of parking facilities is sufficient to cover construction, operation, and maintenance costs, it will likely cause some users to choose not to park. Even where there are few alternatives to driving, parking pricing can encourage employees to seek out carpooling partners. In addition to reducing the cost of parking provision, pricing strategies bring major environmental and congestion benefits, particularly since they tend to reduce peak-period vehicle trips the most.

Parking charges have been found to reduce employee vehicle trips, and thus daily parking demand, by between 7 percent and 30 percent or more, depending on factors such as the level of charges and the availability of alternatives to driving alone. Parking price elasticities generally range from –0.1 to –0.6, with the most common value being –0.3, meaning that each 1 percent rise in parking fees is accompanied by a 0.3 percent decrease in demand.

Cash-Out Programs

Cash-out programs provide alternatives to directly charging users for parking. Under such programs, employers offer employees the choice of free or subsidized parking, a transit/vanpool subsidy equal to the value of the parking (of which up to $100 is tax-free under current federal law), or a taxable carpool/walk/bike subsidy equal to the value of the parking.

Employees who opt for the non-parking subsidies are not eligible to receive free parking from the employer, and are responsible for their parking charges on days when they drive to work. The cost savings associated with cash-out payments depend on the amount of the payments. If the full cash equivalent is provided, this demand reduction program does not reduce the total costs of providing parking. However, employees may accept cash payments lower than the full equivalent of the parking subsidy. If partial cash payments are used, employers face lower overall transportation subsidy costs and employees still benefit.

Differential Pricing by Trip Type

Parking pricing can be used as a sensitive tool to prioritize some types of trip over others, according to their purpose and duration. It allows managers to cater for desirable trips, such as short-term shoppers, while discouraging undesirable commuter trips, which add to peak-hour congestion and occupy a parking space for an entire day. These pricing strategies allow the overall supply of parking to be minimized, while ensuring spaces are available for critical users. They can also alleviate pressure to provide more parking from retailers and businesses, who may be concerned that poor parking availability discourages shoppers. Examples include:

- Lower or zero rates for short-term parking encourage shopping trips, while proportionally higher rates for long-term parking discourage all-day commuter parking, freeing up spaces for customers. Short-term parking allows many people to use a single space over the course of a day, rather than a single commuter, and generates revenue for businesses and sales tax dollars for cities.
- Parking charges that are levied by the hour or day, with no discounts for monthly parking, remove the financial disincentive to take transit occasionally. There is no perverse incentive to drive every day to “get your money’s worth” from the monthly parking pass.
- Parking charges at transit stations that only apply before a certain time (such as 9 or 10 am) encourage off-peak transit ridership where spare capacity is available, rather than contributing to crowding in the peak.

Residential Parking Pricing

Parking charges can also be introduced at residential developments, through separating or “unbundling” the cost of parking from rents or sale prices. Rather than being provided with a set number of spaces whether they need them or not, residents can choose how many spaces they wish to purchase or rent. An alternative to direct charges is to provide “rent rebates” or discounts to residents who own fewer vehicles and do not use their allocated parking spaces.

Parking Benefit Districts

Parking pricing strategies can also be implemented through Parking Benefit Districts. Under this concept, revenue from meters and residential permits is returned to local neighborhoods. Once administrative costs are covered, all money goes to transportation and neighborhood improvements such as undergrounding of utility wires. Parking Benefit Districts allow developments to be built with less parking, while addressing potential spillover problems through market pricing of curb parking.

Earmarking revenue to directly benefit the neighborhood or commercial district helps to generate support for charges from local residents and businesses, which might otherwise resist charging for parking that used to be free. Cities such as San Diego and Pasadena, California, have implemented Parking Benefit Districts in their downtown business districts, using parking meter revenue.

Peer City Reviews

In our research related to peer city parking requirements, we applied two primary criteria: communities of similar size or characteristics to Fort Collins or communities with progressive parking planning policies similar in values to Fort Collins. We identified five primary communities that met these criteria. These communities include:

- Ann Arbor, Michigan
- Berkeley, CA
- Portland, OR
- Eugene, OR
- Arlington County, VA

A summary of the key elements of each of these city's policies are provided below. More detailed information for each community is provided in Appendix B. Appendix B contains selected examples of well-developed or progressive zoning codes including some not on the Peer Cities list noted above.

City of Ann Arbor, Michigan

- City's web page: www.a2gov.org
- Downtown Development Authority web page: www.a2dda.org
- Commuting programs and services web page: www.getdowntown.org

KEY POLICIES AND INITIATIVES

- GetDowntown Program – This is a commuter service and assistance program. It offers commuting programs and services to employees and employers in downtown Ann Arbor. Programs and services include the go!pass, Commuter Challenge, Bike Locker Rentals, Zipcars, free commuting assistance, and commuting materials.

- Go! Pass Program – It is an employee benefit which offers unlimited rides on the City buses with in Downtown Development Authority's (DDA) boundaries. Additionally, this program offers discounts for other commuter services and at downtown businesses.
- Commuter Challenge – It offers prizes for trying alternative modes of transportation. The modes include busing, biking, walking, carpooling, and van pooling. The program is offered only for the month of May.
- Bike Locker Rental – Locker rentals are offered at $60/month. The rentals are offered from April 1 to March 31. The fee is prorated if the rental starts after April. Monthly rentals are not available.
- To encourage alternative modes of transportation, the parking demand for office buildings were dropped from 4 to 3 per 1,000sf.
- Maximum parking demand ratio was implemented for many land uses.
- For downtown projects, developers are not required to provide parking for up to 400% of FAR.
- For some mixed-use land uses, 700% of FAR is allowed and parking is required for FAR above 400%.
- Bicycle parking is required for many land uses.
- Outside bicycle parking spaces can be used for meeting "useable open space" requirements.
- Areas for inside bicycle parking spaces are not included in calculating the vehicular parking requirements.
- Up to 30% of parking supply could be designed for compact cars only.

Arlington County, Virginia

- Arlington County web page: www.arlingtonva.us
- Commuter Service web page: www.commuterpage.com
- Mobility Lab: http://mobilitylab.org/

KEY POLICIES AND INITIATIVES

- Office parking requirement is 1 space per 580sf (with associated apartment use), which is significantly less than the national average. Without apartment use, the requirement is 1/530sf.
- Hotel parking requirement is 0.7 per room. Again, significantly less than national average.
- Underground parking is encouraged.
- Parking requirements for Medical Office Buildings could be reduced by 10%.
- Parking requirements are reduced if approved shared parking programs are implemented.
- Parking is not required for the first 5,000sf of development (some land uses are excluded). For grocery stores, first 15,000sf is exempt, if the grocery store is not the principal land use.
- Office parking requirements could be reduced by up to 10%.
- 100% of required parking could be provided up to ¼-mile away.
- Reduced parking demand with approved TDM programs.
- Up to 15% of parking supply could be designed for compact cars only.
- Maximum parking requirements for many land uses.
- Parking near metro stations is not required if the development is located within 1,000 feet (with some exemptions).

- Mobility Lab is one of the most aggressive and successful transportation alternative programs in the country is a recommended model for Fort Collins to review.

City of Berkeley, California

- City's web page: www.ci.berkeley.ca.us
- Commuter Service web page: www.ci.berkeley.ca.us/commute

KEY POLICIES AND INITIATIVES

- The City offers many commuter programs. These include:
  - The Tax Relief Action to Cut Commuter Carbon (TRACC)
  - Commuter Benefit Services for Employers
  - The City requires that employers with ten or more employees provide a commute program to encourage employees to use public transit, vanpools or bicycles. TRACCC, gives employers several options - businesses can offer their employees commuter tax benefits as a payroll deduction, provide a subsidized benefit, or offer a combination of the two.
- Commute Programs
  - Guaranteed Ride Home Program
  - Ride matching for carpools and vanpools
  - Transportation Programs at UC Berkeley
- Transit Information Services
  - 511 Transit Information
  - Getting There on Transit
  - Clipper, the Bay Area's Smart Card for Transit
- AC Transit Local and Transbay Bus Service
  - Other Bus Services in Berkeley

- Paratransit Services
- Rail Service in Berkeley
- Bay Area Rapid Transit (BART)
- Capitol Corridor (train service from San Jose to Sacramento)
- Connecting AMTRAK passenger rail services

- Car Sharing
- Parking can be provided up to 300 feet away from the development.
- Joint-use, off-street parking is allowed if there are no substantial conflicts.
- Transit Service Fee (TSF) is collected to provide paratransit passes and promote ride sharing.
- Parking requirements are reduced if the development is located within 1/3-mile from a BART station.
- Subsidies available for approved TDM programs.

City of Eugene, Oregon

- City's web page: http://www.eugene-or.gov

KEY POLICIES AND INITIATIVES

- Parking requirements may be reduced (for some land uses) if the developer offers an approved shared parking plan.
- Bicycle parking is required with many land uses.
- Maximum parking ratio is used.
- Maximum parking cannot exceed 125% of minimum parking requirements.
- Parking requirements may be reduced if an approved Transportation Demand Management (TDM) plan is implemented.
- The City offers typical commuter services including bus, car pool, and van pool.

CITY OF PORTLAND, OREGON

- City's web page: www.portlandonline.com
- Commuter Assistance web page: www.portlandoregon.gov/transportation/43820

KEY POLICIES AND INITIATIVES

- Maximum parking for many land uses.
- Parking could be provided up to 500 feet away.
- Stacked parking with valet attendant is allowed.
- Parking requirements could be reduced by 5% for approved carpool programs.
- Parking requirements for residential developments are reduced and completely eliminated for all other land uses, if:
  - The development is located within 1,500 feet from a transit station, or
  - 500 feet from transit street where peak-hour service is provided at 20-minute intervals.
- Bicycle parking is required for many land uses.
- For every five bicycle parking, one vehicle parking could be eliminated.
- Parking requirements could be reduced by 10% if a transit supportive plaza is provided with the development.
- Motor cycle parking could be used to reduce vehicle parking by 5%.
- For every two car sharing parking one vehicle parking could be eliminated.
- "Smart Trip Business" initiative to encourage use of alternate modes of transportation. Some of the programs include:
  - Encourage use of bicycle at work place.

- Businesses could be certified for as, “Sustainability Work Certified.” The certifications include “Certified,” Silver,” and “Gold.”
- Car sharing programs.
- Centralized Transportation Resource.
- Employee education about use of transit.
- “Commuter Challenge” program to encourage the use of alternate modes of transportation.

The table on the following page provides a comparison of the City of Fort Collins to the selected peer cities regarding key zoning code policies and issues.

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Appendix 19

Parking Enforcement Program Audit Checklist

CLEVELAND COUNTY / CITY OF NORMAN, OKLAHOMA:

PARKING STRATEGIC PLAN

Cl;eveland County / City of Norman, OK, Parking Strategic Plan

Parking Enforcement Audit Check-List for Citation Revenue, Receivables Management and Permit Operations

Kimley»Horn

This document can serve two purposes for Cleveland County and the City of Norman. Initially, this checklist can be used by program managers as a tool for the refinement of the current parking enforcement program. This document was originally designed to be used as a checklist to support the auditing of various aspects of a municipal parking enforcement program. For each audit standard, auditors can note whether or not the program complies, or if the result is unclear, and can also add comments or observations supporting their conclusion. Since this document was created based on several communities, it is recommended that this tool be customized to the Norman parking enforcement program and used on an on-going basis.

A. Ordering and Control of Citation Stock

Blank citation stock—whether for handwritten citations or for handheld issuance devices - is an often neglected but critical aspect of parking programs. Blank citations are also potential receivables. Therefore, it is essential that the enforcement program always have an adequate supply of citation stock. In addition, inadequate controls on inventory can allow blank citations to be used for fraudulent purposes. The following are some of the basic checks that apply to this component.

#	Standard	Yes	No	Unclear	Observation/Comments/Action Taken
A.1	**Are there written procedures governing the ordering, acceptance, distribution and tracking of citation stock?**				
A.2	**Do the procedures govern all necessary aspects of the ordering, delivery, acceptance and storage processes?**				
A.2.1	Is there an inventory tracking system that tracks additions to, withdrawals from, and the current citation inventory?				
A.2.1.1	Is the tracking system maintained on an electronic spreadsheet or database to avoid mathematical error?				
A.2.1.2	Does the tracking system cover distribution to subordinate levels, i.e., individual enforcement locations and individual officers?				
A.2.2	Are there specific "trigger points", i.e., inventory levels that when reached, trigger the start of the reorder process with sufficient lead time to ensure that inventories are not exhausted prior to delivery of the new order?				
A.2.3	Is responsibility for ordering stock assigned to a senior				

	manager who understands the importance of this function?				
A.2.4	Does the reordering process include adequate time and instructions to incorporate updates of the citation form to include any recent changes in program business rules or boilerplate information (mail-in payment address, customer service phone numbers, etc.)?				
A.2.5	Are previous orders for citation stock filed for easy access and (as applicable) do they contain the number ranges of the previous orders so that number ranges are not duplicated in subsequent orders?				
A.2.6	Are deliveries of new citation stock both logged against the current order and updated to the inventory tracking system?				
A.2.6.1	Is there a written quality control check list against which the new stock is immediately compared to the written specifications in the purchase order?				
A.2.7	Is citation stock stored in a secure, locked room or closet?				
A.2.8	Is ticket stock periodically inventoried and compared to the tracking system and any discrepancies investigated and reconciled?				
A.3	**Do the procedures govern all necessary aspects of distributing citation stock to the enforcement staff?**				
A.3.1	As appropriate based on the number of agencies and individuals who issue citations, are there intermediate distribution points (i.e., from central storage to the responsible department or the Parking Enforcement office)?				
A.3.2	If the program uses intermediate storage locations, are they also be subject to a periodic inventory review process?				
A.3.3	Are such distributions properly logged to the inventory tracking system?				
A.3.4	At the officer level, is distribution of blank ticket				

	books logged to the tracking system?				
A.3.5	Periodically, are the number of blank books/citations distributed to enforcement offices and individual officers compared to issued tickets updated to the citation processing system or otherwise voided?				
A.3.5.1	Are any discrepancies between citations distributed to offices/individual officers and citations updated to the system investigated and reconciled?				
A.4	**The control of citation stock for handheld issuance devices can present some additional challenges. While some devices may continue to rely on stock with pre-printed citation numbers (which can be handled in the same manner as discussed above for handwritten citations), most handheld systems in use today generate an automatically incremented citation number at the time of issuance. Is generation of citation numbers carefully controlled and monitored?**				
A.4.1	At the macro level, does the handheld system exercise control over the range of citation numbers assigned?				
A.4.1.1	Is the range of numbers used for handheld devices separate and distinct from the numbers used for handwritten citation stock?				
A.4.2	Whether from a central server or from a local base station linked to the handheld docking cradles, are distinct number ranges assigned to individual handheld devices?				
A.4.3	Do base stations (if applicable) and individual handhelds have "trigger" points so that when some set percentage of the assigned number range has been assigned/issued, a new block of numbers can be assigned?				
A.4.4	As with handwritten citations, are periodic audits performed to ensure that number ranges are being fully used? (While not a problem on individual				

	handhelds, some older systems allow number ranges to be stalled at the base station and remain unassigned to handhelds.)				
A.4.5	If handhelds are not permanently assigned to specific officers, is a daily log kept of which officers use which handheld devices?				
A.4.6	Do the handheld devices require the officer to sign on to the device at the start of a shift using a secure password?				
A.4.6.1	Is the date and time of violation printed on each citation automatically generated by the handheld device?				
A.4.6.2	Is the accuracy of the devices' time and date regularly verified by the supervisor/manager?				

B. Control and Processing of Issued Citations

Once issued, a citation becomes a receivable whose value may increase (with late penalties, for example) or decrease (dismissals or reductions in the hearing process, payments, etc.) It is critical, therefore, that all proper actions be taken to both provide due process to the recipient and achieve a payment or other satisfactory outcome for the program, and that all transactions relative to each citation be tracked throughout the citation's life cycle. Key issues to be addressed include:

#	Standard	Yes	No	Unclear	Observation/Comments/Action Taken
B.1	**Are there written procedures governing the control of issued citations and their update to the system?**				
B.2	**Are all issued citations uploaded to the processing system database or otherwise accounted for?**				
B.2.1	For handwritten citations, is there a detailed process for controlling batches of issued citations? Ideally, this should be a three-point process in which counts of citations are made and reconciled at the appropriate enforcement office where the citations are first batched, at the data entry point, and after the citations have been updated to the database.				
B.2.1.1	For handheld citations, is there a procedure to ensure that all handhelds used during the prior shift are cradled and the tickets uploaded to the processing system?				
B.2.2	Does the processing system have sufficient quality control edits to ensure that all required fields have been completed by the officer and that the data in critical fields is correctly formatted?				
B.2.3	Does the parking program follow a procedure for controlling and tracking voided citations, including the issuing officer, date and the reason the citation was voided? This can be done within the processing system or separately?				
B.2.3.1	In addition, is there a process to periodically review individual officer's void history to identify those with excessive numbers of voids?				

B.2.4	With regards to "courtesy warnings", are individual officer's warnings ever checked against the database to see that a warning (instead of a citation) was appropriate?				
B.2.4.1	If a PCO has issued inappropriate warnings, is a notation made in his/her record and follow-up training conducted?				
B.3	**Since the clear majority of parking citations are issued when the driver is not present, the responsible party (usually the registered owner) must be identified after the fact. Does the program have an effective process for identifying the responsible party and his/her mailing address for each citation issued?**				
B.3.1	Does the program have the necessary relationships and data exchanges (either directly or through a vendor) with the appropriate Departments of Motor Vehicles to identify the registered owners of vehicles with in-state, out-of-state plates?				
B.3.2	Does the program have a process for obtaining renter information from rental companies whose vehicles are cited?				
B.3.3	Does the processing system have the ability to update name and address information gained from third parties such as rental companies and National Change of Address (NCOA)?				
B.3.4	When notices are returned as undeliverable, does the program have the ability to prevent mailings to the bad address and obtain and update new, current addresses from the USPS and third party vendors?				
B.3.5	Does the processing system provide regular reports on the percentage of citations for each category (in-state, out-of-state, etc.) for which a responsible party name and address is obtained?				
B.3.5.1	Are deviations from the normal rates investigated?				

B.3.6	Are citations for which a name and address are not obtained (no hits) flagged by the system and scheduled for a follow-up DMV inquiry?				
B.4	**A fair and accessible adjudication function is both legally required and critical to maintaining the program's integrity and support. Does the program, and the processing system, provide such an adjudicatory capability?**				
B.4.1	Are there written guidelines regarding the timeframes under which citations are eligible for the various types of reviews/hearings offered to respondents?				
B.4.2	Does the processing system automatically enforce hearing eligibility rules by edits and security provisions?				
B.4.3	Is the scheduling of a review or hearing subject to governing law or ordinance?				
B.4.3.1	Does a scheduled review or hearing suspend noticing and the imposition of late penalties?				
B.4.4	Does the processing system allow for the updating of citation records with the results of reviews/hearings and any appropriate modifications to the balance due on the citation?				
B.4.5	Are there provisions for defaulting (to the extent allowed by law) respondents who do not appear for hearings? (A default is a legal acceptance of liability for the fine.)?				
B.4.6	Does program staff have access to the data necessary to process administrative claims (i.e., claims of broken meter, missing sign, etc.)?				
B.4.7	In order to allow proper monitoring of the adjudication function, does the program maintain or is it able to produce analyses of decision patterns for the program overall and by hearing examiner/judge, issuing officer, and regulation?				

B.4.8	On a daily basis, does staff perform a reconciliation of all adjudicatory decisions rendered and then update to the citation database to ensure that citation balances are being adjusted appropriately?				
B.4.9	Do materials provided by the program (on the citation itself, on notices, hearing decisions, program handouts, web-site, etc.) fully and clearly inform citation recipients of their rights and obligations, and how to access service?				
B.5	**Once issued, are citations processed through their life cycle in a timely manner in compliance with applicable laws? (Ideally, this is largely done on an automated basis by the citation processing software.)**				
B.5.1	Is the citation life cycle documented and is the system audited on a regular basis to ensure that citations are being processed in compliance with it?				
B.5.2	Are late penalties applied to eligible citations at the proper time and in the proper amount?				
B.5.3	For delinquent citations, are notices mailed on a timely basis?				
B.5.4	When mail is returned as undeliverable, are the citation records flagged so that a more current address can be sought?				
B.5.5	When appropriate—such as pending a scheduled hearing or while a claim is being researched—are other processing actions (such as notices) suspended?				
B.5.6	At a minimum, is the processing system able to generate exception reports for citations that have been in a suspended status for an excessive number of days?				
B.5.7	How often are such reports run and reviewed?				
B.5.8	Does the system have the ability to identify citations that have aged into a new status, such as eligibility for referral to a collection agent or write-off?				

B.5.9	Does the processing system automatically carry out the appropriate "next action"?				
B.6	**Are citation payments processed in such a manner that ensures complete, timely and accurate application of all payments?**				
B.6.1	Does the program have a written security policy which is provided to all new employees?				
B.6.2	Are employees required to acknowledge receipt and familiarity with the security policy in writing and is such documentation included in the employee's personnel file?				
B.6.3	Does access to the processing system require sign-on with a User ID and a password?				
B.6.4	Are user ID's controlled by a management level employee and documented in writing, with the documents stored securely?				
B.6.5	Are users required to change passwords on a regular basis (no less frequently than every 60 days)?				
B.6.6	Does the system provide various levels of access—based on job requirements, such as read only, routine update, and restricted access to sensitive transactions?				
B.6.7	Does the processing system provide a complete audit trail for all transactions which directly or indirectly impact the balance of a citation or the program's ability to collect outstanding fines?				
B.6.8	Do the audit trails include the User ID of the person performing the transaction and the date and time of the transaction?				
B.6.9	Does the processing system prevent the deletion of any transaction record or citation and plate records? If a transaction must be reversed (e.g., an				

	incorrectly entered payment) the system should reflect the original transaction, a reversal transaction, and the corrected transaction.				
B.6.10	Does the system (or the server/network which supports it) provide sufficient levels of back-up so that program data is always secure?				
B.6.11	Does the program have a written disaster recovery/business continuity plan which is tested on at least an annual basis?				
B.6.12	Are ongoing or intermediate tasks which support the larger DR plan (such as regular database backups) carefully monitored and documented?				

C. Pursuit of Delinquent Citations

While a high percentage of citations are paid in a timely manner, either after issuance or following a hearing, many require addition action. These generally fall into three categories: in-house pursuit of delinquent accounts, booting and towing of "scofflaw" vehicles, and use of third party collection firms. Each has its own requirements.

C.1	**Are in-house collection efforts sufficiently robust to ensure that citations are not unnecessarily assigned to collections and therefore subject to commission?**				
C.1.1	Are the citation life cycles (for normal citations, fleets, rentals, etc.) documented and understood by all program staff?				
C.1.2	As noted above, does the program have an effective means of obtaining name and address information on the party responsible for each citation in a time manner after issuance, as well as the ability to obtain updated addresses for citations which result in returned mail?				
C.1.3	Does the processing system automatically add late penalties and generate delinquent notices according to the approved life cycle(s)?				
C.1.4	If required or permitted by law or ordinance, does the system support different life cycles for citations issued to different categories of respondent (in-state, out-of-state, rental, government, etc.)?				
C.1.5	Does the system support generation of all required notices, as well as additional collection notices prior to assignment to collection agents?				
C.1.6	If allowed by state law, is the program's in-state DMV informed of registered owners with sufficient delinquent citations to qualify for registration non-renewal or denial of other privilege?				

C. 2	**Does the program utilize a strong, accountable booting/towing program by which scofflaw vehicles identified on the street can be immobilized or impounded until outstanding fines are paid?**				
C.2.1	Does the program have a dispatching system which tracks all authorized boot and tow assignments and actual boots and tows or reasons why the assigned action was not carried out? Ideally, this system should be automated.				
C.2.2	Does the system have strict procedures and operational/technical support so that booted and towed vehicles cannot be released without payment of all fines, penalties and boot/tow/storage fees?				
C.2.3	(If appropriate) On a daily basis, are boot releases reconciled to boots authorized, boots still on the street, and vehicles not found ("Gone on arrivals")?				
C.2.4	On a regular basis--no less than monthly, Is the tow lot inventory report reconciled to vehicles physically on the lot?				
C.2.5	Does the tow lot inventory system allow for the aging of tows so that un-redeemed tows are auctioned in a timely manner and auctioned as appropriate?				
C.2.6	Whether or not a private tow vendor is used, is the tow operation audited on a regular basis to ensure that the correct tow and storage fees are collected?				
C.2.7	If a vendor is used, is it responsible for any citation fines and fees it fails to collect prior to release of a vehicle?				
C.3.	**Are third party collection firms used as appropriate and with proper controls and safeguards?**				
C.3.1	Is the assignment of cases to the collection agent based on documented criteria and based on time- or event-driven criteria (i.e., a set number of days since issuance or since a particular in-house notice				

	or the lapse of a DMV registration hold)?				
C.3.2	Are citations only assigned after the completion of all in-house collection actions with a reasonable expectation of success?				
C.3.3	Are citations assigned on a timely, regular schedule, such as monthly or quarterly?				
C.3.4	When cases are assigned, is the processing system updated with relevant information, particularly the date?				
C.3.5	Are assigned citations flagged so that in-house noticing is suspended?				
C.3.6	Does the agreement with the collection agent specify particular collection actions that will be taken and a set timeframe for completing those actions?				
C.3.7	Does the agreement with the collection agent specify City rights such as the right to recall cases at any time, and the right to assign cases to another collection agent following recall?				
C.3.8	Is there a set schedule on which the collection agent remits payments to the parking operator? While daily remittance might not be practical, it should be no less than weekly.				
C.3.9	Does the parking staff have a documented process in place to immediately reconcile all payments from the collection agent and investigate/reconcile any payments that cannot be applied?				
C.3.10	Does the system provide regular reports on the inventory of cases held by the collection agent, including aging by date of assignment, so that the collection agent's effectiveness can be evaluated?				
C.3.11	Does the program have an ongoing process for "salting" payments on assigned cases to ensure that the collection agent applies and forwards all payments in a complete and timely manner?				

C.3.12	Does the City regularly audit the records of the collection agent, not only to ensure that all payments are being forwarded in a timely and accurate manner, but also to insure that all contractually required collection actions are being taken and documented?				
C.3.13	As part of its citation life cycle, does the City have write-off criteria? Generally, when cases are returned or recalled from the collection agent, write-off is the appropriate action. Otherwise, the potential value of the program's accounts receivable will be overestimated and possibly misinterpreted.				

D. MONITORING AND AUDITING OF PARKING PERMIT OPERATIONS

In the municipal environment parking permits are often used to control parking in designated lots and structures or to limit parking in residential neighborhoods whose quality of life is threatened by nearby parking generators. Because of the privileges they convey, and sometimes the cost, permits can be valuable commodities and must be safeguarded much like cash. In addition, it is vital that they be sold/issued in strict accordance with program rules and only to those who are eligible. Key elements to be audited include:

#	Standard	Yes	No	Unclear	Observation/Comments/Action Taken
D.1	**Are there written procedures governing the ordering, receipt, distribution, and sale of permits?**				
D.2	**Do the procedures govern all necessary aspects of the ordering/receipt/sale process?**				
D.2.1	Is there an inventory tracking system that tracks additions to, withdrawals from, and the current permit inventory? Ideally this should be maintained on an electronic spreadsheet to avoid mathematical errors.				
D.2.2	Are there written "trigger points", i.e., inventory levels that when reached, trigger the start of the reorder process with sufficient lead time to ensure that inventories are not exhausted prior to delivery of the new order? This is particularly important for permits which generally expire on a set schedule with a change in colors used to differentiate between current and outdated permits.				
D.2.3	Is responsibility for ordering stock vested in a manager who understands the importance of this function?				
D.2.4	Is permit stock designed to discourage counterfeiting (such as reflective decals) and to facilitate easy verification by enforcement staff (large numbers or letters for permit districts/structures, and bold colors that readily distinguish current permits from old)?				
D.2.5	In addition, is each permit for a type/district numbered consecutively so that inventories can be controlled and fraudulent use of lost/stolen permits				

	can be minimized?				
D.2.5	Does the documented reordering process include adequate time and instructions to incorporate any desired changes in color or fraud deterrent features, and delivery dates that support the renewal cycle?				
D.2.6	Are previous orders for permit stock filed for easy access and (as applicable) contain the number ranges of the previous orders so that number ranges are not duplicated in subsequent orders?				
D.2.7	Are deliveries of new permit stock both logged and reconciled against the current order and updated to the permit inventory tracking system?				
D.2.8	In addition, is there a written quality control check list so the new stock can immediately be compared to the written specifications in the purchase order?				
D.2.9	Is unissued permit stock stored in a secure, locked room or closet?				
D.2.10	Is the permit stock periodically inventoried and compared to the tracking system and any discrepancies reconciled?				
D.3	**Do the procedures govern all necessary aspects of distributing permits to the sales staff?**				
D.3.1	As appropriate based on the number of locations and individuals who sell permits, are there intermediate distribution points (e.g., from central storage to the sales locations)?				
D.3.2	If the program uses such intermediate storage locations, are they subject to a periodic inventory process?				
D.3.4	Are any such distributions properly logged to the inventory tracking system?				
D.3.5	At the cashier or customer service representative level, are distributions of permits logged and reconciled each day, with the number of permits sold and those still on hand equaling the number distributed at the start of business?				

D.3.6	Are permit sales also incorporated into the daily cashier balancing process?				
D.3.7	If permits sales are tracked within the citation processing system or another automated tracking system, is that system periodically audited for gaps in the permits sold, and missing permit numbers investigated?				
D.4	**Are permits sold in compliance with eligibility standards and other business rules?**				
D.4.1	Are written guidelines regarding eligibility to buy permits, permit costs, and permit duration and format available to the public?				
D.4.2	Is all staff involved in the sale of permits, otherwise serving permit customers, and enforcing permit regulations fully familiar with the business rules and eligibility guidelines governing the program?				
D.4.3	Does the process for opening a permit account include a written application and provision of documentary evidence as required by the program guidelines? Such documentation usually includes proof of residence at an eligible address (such as a utility bill) and proof that the permitted vehicle is registered at that address.				
D.4.4	As an aid to the confiscation of improperly used permits, do the program rules state—to the extent legally permitted—that issued permits remain the property of the program and can be confiscated by enforcement personnel if used contrary to program rules?				
D.4.5.	Are copies of completed applications and supporting documentation filed for at least as long as the account is active plus some reasonable period?				
D.4.6	Do program managers periodically audit permit sales to see that the sampled permits/accounts comply with program guidelines regarding residence, vehicle registration and number of permits issued (as				

	applicable)?				
D.4.7	If renewal notices are mailed to account holders, is this done with ample lead time to ensure that mail orders can be processed such that new permits can be received and displayed by the required date(s)? Failure to do so can result in laborious work-arounds that can be abused.				
D.4.8	If supported by the enforcement handheld devices, are automated lists/files of permits reported as lost or stolen periodically downloaded to the handhelds so that officers can screen permits on vehicles for possible abuse?				

Appendix 20

Sample Parking Enforcement Operations Manual

Introduction

Sample Parking Enforcement Operations Manual & Operating Procedures

This sample parking enforcement operations manual & officer handbook is being provided to Cleveland County and the City of Norman as a mechanism to facilitate parking enforcement program development, training and implementation.

Many of the specific rules and regulations have been derived from highly effective parking enforcement programs from around the country. These rules and regulations should be reviewed and modified as needed to reflect the standards of the County and City.

Table of Contents

Chapter 1

Mission – Duties and Responsibilities

1/100 Introduction

This manual was prepared for Parking Enforcement Officers of the City of Norman, hereafter referred to as PEO's or Officer's[1].

PEOs are not Peace Officers; however, they are involved in the enforcement of state law and local ordinances, and they provide a highly visible and valuable service to the community. Most citizens appreciate having parking regulations enforced. Few, however, appreciate receiving parking citations or finding that their vehicles have been impounded. Due to this unique job status, a PEOs duties must be performed with greater sensitivity and a different perspective than other parking program personnel.

This Manual sets forth the Policies and Procedures of the Parking Services Division of The City of Norman. It also provides a tool for PEOs to effectively and efficiently perform their required duties. Every officer shall be issued a manual and be responsible to read and be aware of the information written herein.

1/101 Mission of the Parking Services Division

It is the mission of the Parking Services Division of The City of Norman to serve the City's residential and commercial communities by providing quality public works services and infrastructure with environmental and fiscal responsibility.

Parking Services will provide for the safe and efficient movement of people and goods while promoting the economic vitality of the City and the quality of life of it residents through diligent enforcement of authorized regulations with integrity and empathy.

1/102 Duties and Responsibilities

The Parking Services Division manages the on-street residential parking permit program and the parking enforcement function.

1/102. 1 Parking Ambassador (PA)

- Patrols an assigned route, identifies vehicles parked illegally or with expired registrations, and issues a parking citation.
- Responds to parking complaints.
- Conducts field investigations of posted signage.
- Operates a vehicle, two-way radio, handheld computer, and other miscellaneous tools such as a chalk-stick, flashlight, etc.
- Maintains equipment and adheres to safe operating procedures.

[1] Technically, the ordinances authorizing the current enforcement set-up refer to Parking Control Officers, but the Program has adopted the operating title of Parking Ambassador because it better describes the positive role that PA's are expected to fill.

- Reports traffic accidents, abandoned vehicles, missing/vandalized signage, miscellaneous municipal code violations, and traffic hazards.
- Responds to miscellaneous inquiries from the public and City staff.
- Performs special assignments upon request.
- Performs other related duties as assigned.

Chapter 2

CONDUCT

2/100 Code of Ethics

PEOs have a fundamental duty to serve the public. In doing so they must display honesty and integrity while obeying all laws and City policies.

PEOs shall enforce parking regulations and perform all other required duties courteously and appropriately without favor, malice or ill will. PEOs shall never accept favors or gratuities.

Gratuities are defined as any type of gift or service of value, free beverages, free or reduced-priced meals, or money. If a resident, visitor or business person along the enforcement route offers any such item it must be refused. You are expected to decline graciously any such gifts or tokens of appreciation. Acceptance of gratuities is a disciplinary offense.

2/101 Professional Demeanor and Conduct

It is policy of the Parking Services Division, the City of Norman, that when dealing with the public and co-workers, PEOs should be courteous, respectful, cooperative and professional at all times.

At no time shall an officer make inappropriate comments or gestures, make physical contact with a member of the public or a co-worker, or use profane or insolent language.

A member of the public has the legal right to report behavior he or she believes to be unprofessional. The officer shall readily provide his/her first name, their manager's name and the office address and phone number to a member of the public upon request.

City and company policy prohibits discrimination on the basis of age, race, gender, color, national origin, disability, or sexual preference in any work related activities. Sexual harassment in the workplace is a form of discrimination. Parking enforcement staff shall comply with these policies.

2/102 Roll Call Demeanor

Roll call is the beginning of the duty shift and is a mandatory duty assignment. Officers are required to report to roll call on time and be prepared to begin work. This preparation includes being in complete uniform with all necessary equipment ready.

Roll call is the time for assignment, instructions and briefings to be given as a team. Roll call shall be brief and concise. On occasion roll call training is presented, which extends the time allotted. Officers shall

behave in a professional manner throughout roll call. Officers shall not leave roll call unless excused by the Supervisor. Lengthy personal discussions are to not be held while roll call is in session.

When roll call is completed, all officers are excused and shall report immediately to their assignments.

2/102. 1 Conduct Towards Fellow Employees

Officers shall treat Managers, Supervisors, fellow Officers and City Employees with respect. Officers shall be professional, courteous and civil at all times in their conduct toward one another.

2/102. 2 Standard of Conduct

As a PA, you are constantly in the public eye. The services you provide for the people must be free of hazards and liabilities. Drugs and alcohol can impair public trust and public safety and create criticism of all parking program employees. Therefore, being under the influence of or possession of illegal drugs or alcohol in the workplace is strictly prohibited. If you are found to possess illegal drugs/substances or alcohol, you are subject to termination of employment. This can also apply to off-duty drug use by parking enforcement staff. If a supervisor believes you are affected by the use of drugs or alcohol, the supervisor may require a drug test through a local medical facility. Refusal to submit to such tests may be considered insubordination and grounds for termination.

2/103 Court Demeanor

From time to time PEOs may be required to testify in court or at an official hearing. An officer may be summoned for the following:

- County Court citation appeals.
- Administrative impound hearings.
- Witness to a traffic accident or a crime.
- Involvement in a traffic accident or a crime.

Notifications to appear in such hearings come in the form of subpoenas or other official documents. These notices indicate that attendance is a primary duty assignment. Should an officer experience an illness or other emergency, which will prevent attendance, immediate notification to the proper person is required, since attendance is mandatory. If notification is made to the immediate supervisor, the officer must indicate the inability to attend the hearing and give the supervisor the necessary information.

Prior to attending such hearing, the officer shall review all necessary documents and relevant notes. Hearing cases shall be reviewed with staff prior to representing the City. Cases may be discussed with the City Attorney or other appropriate personnel if an officer is asked to do so.

When testifying, the officer shall respond only with facts as they are known and shall not express personal opinions, prejudices or ideas. The officer shall answer questions that are asked as directly and briefly as possible.

Chapter 3

Guidelines for Personal Appearance and Uniform Standards

3/100 General Provisions

PEOs shall be neat, clean and well-groomed at all times while on duty.

PEOs shall wear uniforms that are clean, neat and pressed at all times. Leather accessories shall be kept shined; metal accessories shall be polished.

The City will provide a laundry/cleaning service which will rotate clean uniforms on a bi-weekly basis. It is the officer's responsibility to have soiled uniforms ready for pickup on the appropriate day and to use the clean uniforms in such a manner so they last until the next delivery of clean uniforms.

Officers shall present a professional appearance at all times while on duty. The full required uniform shall be worn on duty. No unapproved articles of clothing are to be worn with the required uniform. In addition, no part of the uniform shall be worn in conjunction with civilian clothes while the PA is off-duty.

3/101. 1 Hair Standards

Hair shall be neatly trimmed/combed at all times with no eccentricities of style, color or fashion. Hair shall be arranged so as not to interfere with vision in any way.

When male officers choose to wear mustaches, beards, or sideburns they shall be worn short and neatly trimmed. No other facial hair is authorized.

3/101. 2 Jewelry

For the officers' safety, excessive jewelry shall not be worn. No jewelry shall be worn that dangles or can be grabbed or pulled off the officers.

For officers, "excessive jewelry" shall include nose rings or any other type of pierced jewelry or decoration, other than earrings, that is worn on the body and exposed to public view. Only one pair of stud earrings is authorized, one per ear.

3/101. 3 Makeup

When female officers wear makeup it shall be worn moderately.

3/102 Uniform Standards

Uniformed personnel shall possess at all times while on duty a serviceable uniform and the required equipment to perform assigned duties. The official uniform shall be worn in a professional manner. Buttons and zippers shall be secured at all times. Nothing shall be carried in the uniform pockets, which would detract from the proper appearance of the uniform.

3/102. 1 Required Uniform Items

PEOs shall be provided basic articles of uniform and other articles of uniform as needed that shall be replaced as necessary. The uniform currently includes shirts, pants, shorts (for summer), a jacket, a parka for winter, and winter boots. Officers are expected to provide their own black shoes for patrol when winter boots are not necessary. If the Manager determines an article of clothing is no longer serviceable, a new one will be issued.

3/102. 2 Shoes and Socks

Shoes shall be solid black in color, either low or high cut and plain. Leather shall have a polished or glazed finish.

3/103 ID Badges

Officers shall wear the official ID Badge, which will contain their last name for identification purposes. The nameplate shall be legible to members of the public facing the PA.

3/103. 1 Lost, Stolen or Damaged ID Badges

When a badge is lost, stolen or damaged, the Officer shall immediately report this to the On-Street Manager. The Supervisor shall arrange for immediate replacement of the lost, stolen or damaged badge.

3/103. 2 Misuse of an ID Badge

The ID badge shall not be carried, worn, displayed, or used in any manner by an officer who is off duty. It shall never be displayed in an attempt to gain favor, obtain gratuities, or otherwise receive a benefit to which the PA would not otherwise be entitled. The ID badge shall not be used as a law enforcement device under color of authority or in any attempt to gain exemption from any law enforcement action. The badge shall never be used to harass, discriminate against, and intimidate others.

3/104 Accessories

Accessories are personal items not issued nor required by the Department. If officers choose to wear or carry such items they must conform to company guidelines. Approval of all accessories must be obtained in advance.

3/104. 1 Purses and Bags

Any purses or bags that are carried while in uniform shall be conservative in appearance. Officers shall not wear or carry any backpack, “fanny pack” or similar type bag while in uniform and on duty.

3/104. 2 Timepieces

Timepieces or watches worn or carried by officers shall be conventional, conservative and inconspicuous, preferably the type worn on the wrist.

3/104. 3 Cell Phones

In the interest of safety, Officers shall not talk or text message on a cell phone while driving. Use of cell phones for personal calls should be kept to an absolute minimum. If the PA must conduct personal business on the cell phone, this should be done during the break.

Chapter 4

Proper Use of Equipment

4/100 General Provisions

All assigned equipment is City property and the care and maintenance of such are the responsibility of the PA. Officers shall treat assigned equipment with responsibility and the care necessary to maintain it in safe and effective operating condition. All equipment must be returned to the proper location at the end of the work shift. Vehicles shall be parked in the designated areas.

Radios shall be turned off and returned to the appropriate charging units. Handheld citation writers shall be returned to the specific assigned charging port.

4/101 Vehicles

Officers may be assigned to drive an enforcement vehicle. The program is currently using Ford Escapes and Chevy Trackers, but this could change over time.

4/101. 1 Assignment of Vehicles

Each officer assigned a vehicle is responsible for the proper care, fueling and monitoring of that assigned vehicle, as well as any other vehicle that may be assigned on a temporary basis. Each officer is also responsible for ensuring that any assigned vehicle is left clean and free of trash at the end of shift. Each officer is required to use the vehicle assigned to him/her, as applicable. When an assigned vehicle is inoperable or unavailable due to routine maintenance, the On-Street Manager will assign the officer another vehicle, if available. At the beginning of each shift, each officer shall complete the vehicle sign-in and out sheets (found in each vehicle). If it becomes necessary during a shift to change vehicles, the officers shall ensure that the new assignment is entered on the assignment sheets.

4/101. 2 Safety Checks

Prior to driving the vehicle at the beginning of each shift each officer shall complete a safety check of that vehicle. The safety check includes checking all lights, turn signals, brakes, tires, windshield wipers, and mirrors. If any safety item needs repair, the fact should be reported to the On-Street Manager immediately and his/her instructions followed. Any dents or other minor damage that does not affect the safe operation of the vehicle, including handles, hinges or other parts that many be loose, shall be reported to the Manager at the end of the shift.

4/101. 3 Maintenance

The Vehicles used for parking enforcement are the property of the City of Norman. Each Officer is responsible for monitoring the condition of his/her assigned vehicle(s). Vehicles that exhibit operating problems or damage should be reported to the On-Street Manager who will arrange for repair by the City.

It the vehicle becomes disabled while the Officer is on patrol and it is totally inoperable or unsafe to drive it to the shop, the PA should communicate with the On-Street Manager (or the office) and await instruction.

4/101. 5 Vehicle Fueling

Officers assigned a vehicle are responsible for refueling the vehicle at the designated City fueling station which is currently the Police Station. When fueling, officers will need to use both their employee card and the vehicle card. This allows the City to track fuel usage by both officer and vehicle. Any officer driving a vehicle on a temporary assignment basis shall ensure that it is left with a full gas tank at the end of shift. PEOs may fuel their assigned vehicles during their shift, consistent with efficient patrol practices.

4/101. 6 Driving Safety

The emergency flashers and directional arrows must be activated any time the vehicle is being driven slower than the normal flow of traffic.

The rotating lights on top of the vehicle must be activated during inclement weather for visibility.

To ensure safety and minimize traffic congestion during the issuance of parking citations, officers are to park vehicles safely; whenever possible vehicles shall be parked at the curb, out of the flow of traffic. Vehicles should not be double-parked while the officer is issuing a citation; this can be dangerous for the PA and contributes to traffic congestion.

4/101. 7 Traffic Accidents

Whenever an officer is involved in a traffic accident while on the duty, the Police Department should be notified by cell phone immediately, advising the dispatcher if there are injuries or if an ambulance is needed. The officer must not leave the scene until the Police respond and take appropriate reports. Do not move the vehicle until instructed to do so. If the vehicle is not drivable the Off-Street Manager should be advised.

4/102 Radios

Officers will usually use the cell phones integrated into their handheld issuance devices to communicate with the office and other enforcement personnel as necessary. However, two-way radios provided by the City will be used on Saturdays during University of Nebraska home football games (or other special events as deemed necessary). The following rules apply to the use of radios:

4/102. 1 Assignment of Radios

All radios are identified by a Program-assigned ID number. PEOs will sign out radios by name and log the ID number. If an assigned radio is out of order and there are no spares available, the Manager is to be notified.

4/102. 2 Maintenance of Radios

Each officer is responsible for the proper care of his/her assigned radio. Should the radio become inoperable the officer shall notify the On-Street Manager.

4/102. 3 Charging Radio Batteries

When not in use, radio units must be placed in the charging port. The Officer shall verify that radios are charging.

4/103 Handheld Enforcement Computers

Handheld citations writers must be properly cradled in designated ports. Officer shall verify that unit is charging and transmitting data.

4/103. 1 Assignment of Handhelds

Each handheld unit is numbered and each officer has an assigned unit. If the assigned unit is out of order, a spare shall be used. If there are no spares available the Supervisor shall be notified and shall assign a unit that is normally assigned to an officer who is off- duty.

Chapter 5

Personnel Issues

5/100 General Provisions

Scheduling and deployment of personnel for the purpose of optimum effectiveness in serving the needs of the program and the Department and company as well as the personal concerns of the officers requires management to address many priorities. Both management and employees have the responsibility of conforming to the necessary requirements to effectively meet these needs.

5/101 Personnel Schedules

Officers who are full-time employees currently work a five day, Monday to Friday schedule with individual shifts starting at various times so as to provide coverage across the times that meters and other regulations are in effect. One part-time PA currently works 20 hours per week. The current full-time daytime assignments are as follows:

- 7:00am to 3:30pm
- 8:00am to 4:30pm
- 9:00am to 5:30pm

The current part-time assignment is:

- Thursday: 6:00pm to Midnight
- Friday: 2:00pm to Midnight
- Saturday: 2:00pm to Midnight

5/101. 1 Deployment Schedules

Schedules are developed for optimum field coverage and are subject to change by management as the need arises. Schedules are reviewed periodically.

5/101. 2 Sick/Personal Leave

When an officer is unable to report for duty as assigned due to an illness or unexpected personal emergency he/she must immediately contact the On-Street Manager. If this is not possible a message must be left in the office stating the reason for absence, the length of time off anticipated and a phone number where the Supervisor may reach the officer.

5/101. 3 Vacation Schedules

PEOs will receive 5 (five) days' vacation per year. Vacations must be requested a minimum of seven days in advance. If there tow employees request the same week or days for vacation, the decision will be made by the Manager at his discretion.

5/102 Personnel Assignments

It is the policy of the program to make beat/route assignments based on priority enforcement requirements and public complaints. Day Shift officers are normally assigned to beats/routes on a rotating basis. Management reserves the right to make assignments to meet the best interests of the City.

5/103 Meal Periods/Breaks

Officers are entitled to a half-hour break which can be used for meals. The time of the break period may be defined by the Manager based on the needs of the assignment.

It is necessary for officers to conduct themselves in a manner that provides the highest level of professional service to the City. Officers on all shifts are to sign out of service (by clocking in and out at the Haymarket site) when they leave their assigned route to begin the break period. The time it takes to travel to a location for a meal is included in the half hour time period. It is important also to be aware that program vehicles are to be used solely for program business.

Chapter 6

Parking Enforcement Procedures

6/100 General Provisions

The purpose of parking enforcement is to ensure the availability of parking in commercial and residential parking areas, to prevent congestion during peak traffic periods, to keep safety zones clear such as crosswalks, fire lanes and bus zones, and to maintain disabled persons' access. Parking enforcement is also necessary to clear the streets as required for a variety of other situations such as street sweeping, construction and special events.

6/101 Citing Instructions

PEOs are authorized to enforce parking regulations pursuant to the following sections of the City of Norman Municipal Code:

10. 08. 030, 10. 08. 050, 10. 32. 010, 10. 32. 015, 10. 32. 020, 10. 32. 050, 10. 32. 070, 10. 32. 080, 10. 32. 090, 10. 32. 100, 10. 32. 110, 10. 32. 140, 10. 32. 150, 10. 32. 160, 10. 32. 170, 10. 32. 190, 10. 32. 200, 10. 32. 210, 10. 32. 220, 10. 32. 240, 10. 32. 250, 10. 32. 260, 10. 32. 280, 10. 32. 290, 10. 32. 300, 10. 32. 310, 10. 32. 320, 10. 32. 330, 10. 32. 350, 10. 34. 050, 10. 34. 060, 10. 40. 110, and 10. 44. 030. (Update with appropriate City of Norman ordinance numbers)

Parking citations may be issued when a vehicle is found to be in violation of any of the above City of Norman Municipal Code Sections or Montana Vehicle Code Sections covering the proper registration of motor vehicles, and in accordance with Department Policy. Under certain circumstances, PEOs may also issue citations for illegal parking in taxi zones.

PEOs shall not enforce or cite vehicles outside the City of Norman Downtown Enforcement Boundary. Parking citations shall only be issued for parking violations or registration-related violations.

A citation shall not be issued if at the time of the violation, any required sign or marking is not in place and sufficiently legible and visible to be seen by any ordinarily observant person.

6/102 Issuance of Citations

Prior to issuing a parking citation, the officer shall thoroughly check the vehicle (front, rear, dash) to determine that it is in violation and there is no obvious problem such as a flat tire or a person inside who needs assistance. If there is a note or the hood is up indicating a possible mechanical problem, the officer may allow a reasonable period of time for the driver to get assistance, depending on the nature of the violation.

Generally, the PA will list the license plate of the vehicle being cited; DMV records will later be accessed to identify the registered owner/responsible party. If a vehicle lacks a license plate, the officer should carefully record the vehicles VIN number, which can be found on the driver's side of the dashboard, just inside the windshield.

The citation and the envelope shall be secured to the vehicle in a conspicuous location, preferably under the windshield wiper on the driver's side.

6/102. 1 Return of Vehicle Operator

If the operator of the vehicle is present during the issuance of the citation and has been given the opportunity to move the vehicle or if some other communication has taken place, the officer shall so indicate in the comments/notes section of the citation.

When the officer becomes aware that a driver may leave without waiting for completion of the citation, it is important to make every attempt to ensure that the driver is aware that a citation will be issued, and serve the individual personally if she/he remains at the site. Nevertheless, at no time shall an officer make any attempt to forcibly detain the driver or stop a moving vehicle and place him/herself in danger. Even if the driver/vehicle leaves before the citation can be served, the officer should immediately complete the citation, retain the "respondent" copy and record the citation as a "driveway." The respondent copy will be mailed to the registered owner at a later time. At no time shall an officer make a determination of a violation and then wait to complete the citation at a later time.

6/102. 2 Issuance of Warnings

It is City policy that out-of-county vehicles are given two "courtesy warnings" per year. Warnings are intended to educate the vehicle owner/operator without creating a bad impression of the City for a visitor. The enforcement handhelds communicate with the live database to indicate whether the vehicle has had previous warning in the last calendar year, and the plate configuration will indicate whether it is registered out-of-county. The issuance of a warning should be treated identically to issuance of a citation by the PA (i.e., the same required circumstances, same signage requirements, same conduct on the part of the officer).

6/102. 3 Real-time Transmission of Citations

PEOs should be aware that in normal operations, citations are transmitted to and updated to the database on a real-time basis as soon as the officer completes the entry process on the handheld. If a vehicle owner returns to his/her vehicle just as a citation has been completed and protests that the citation should not be issued, he/she should be told that issuance is complete, and the PA should briefly explain the contest process, and direct the owner to the back of the citation and the program's web-site. The PA should complete the discussion as quickly as possible without being rude and resume patrol.

6/102. 4 Voided Citations

Occasionally it is necessary to void a citation after it has been issued. The most frequent examples are when the PA makes a mistake in issuing the citation (such as citing the wrong ordinance) or when the PA issues a citation prior to noticing that the vehicle is occupied.

When an officer wishes to void a citation, s/he should flag it as a void in the handheld. Then when back at the office, the citation must be printed out and sent to the Violations Bureau which will actually void the citation.

6/103. 1 Computerized Handheld Citation

When issuing citations by the use of a computerized handheld citation writer, the officer shall ensure that the unit is in working order prior going into the field. The officer shall ensure the battery and printer are operational, the date and time are accurate, and that there is a sufficient supply of blank citation stock. When issuing his/her first citation of the day, the PA shall also verify that his name, ID and beat/route are being printed accurately.

6/103. 2 Manual Citation

On rare occasions an officer may need to issue a citation by writing it manually due to problems with the handheld computers. When this is necessary the following procedures must be followed:

The citation must be filled in completely and legibly. Black ink is required; in inclement weather pencil may be used. Officers shall print using block letters. When entering information on the citation the officer must remember to press hard enough for all copies to be legible. The original copy of the citation shall not contain any information which does not appear on the violator's copy.

If critical elements are not included on the citation it may not be upheld in the hearing process.

Those important elements are:

- Date and Time
- Vehicle License, Make and Model
- Violation code
- Meter # (if applicable)
- Time first observed (if applicable)
- Location of violation

6/103. 3 Entering Violation Date

The date is the day on which the vehicle is observed in violation and is entered as month, day and year (i.e.: 03/06/00). In the hand held computer the date is pre-programmed. On the manual citation this shall be entered in the space provided for date.

6/103. 4 Entering Violation Time

The hand held computer keeps time and will indicate the time of the citation. On the handwritten citation, the time must be written in the space provided. The time used on the citation is based on the 24-hour (Military) clock. If the hour is less than 10, fill in with a zero to the left so that the time is always a four-digit number (i.e.: 9:05 a. m. is 0905; 9:05 p. m. is 2105).

6/103. 5 Entering Vehicles License Number or VIN

The license number is to be entered exactly as it appears on the license plate of the vehicle in violation using standard letters and numbers. If there is no plate on the vehicle, the officer should enter the Vehicle Identification Number (VIN) in the appropriate field on the citation form. The VIN can be found on the front dashboard just inside the driver's side windshield. It is a long, complex list of numbers and letters and should be copied carefully to avoid misidentifying the vehicle.

The State in which the license plate is registered is important. The officer shall ensure that the correct State is entered. There is a drop down menu of state abbreviations in the handheld device. It is also important to identify the month and year that the license plate registration expires and enter it correctly.

6/103. 6 Entering Vehicle Make, Body Type and Color

For proper identification of the vehicle it is necessary to indicate the correct vehicle make; do not guess. Body type and color are important for corroborating evidence. Several makes and body types are preprogrammed in the computer but must be written on the manual citation. Vehicle color also is used to describe the vehicle, and the officer shall indicate the color as correctly as possible. It is understood that many colors are difficult to identify and a judgment decision may be called for. The handheld issuance devices will provide drop-down menus of the vehicle makes, body types and colors. In the course of normal operations, officers should endeavor to learn these codes in case they have to use handwritten citations at some point.

6/103. 7 Entering Vehicle Location (Verify)

It is necessary to be as accurate as possible when indicating the location of the vehicle in violation. When using a description, don't put "St", "Street", "Rd", "th", or "nd" at the end of numbers. Indicating the block number only is unacceptable in determining specifically where the vehicle was parked.

Example of acceptable addresses:

1) 11-12
2) P 11-12

Example of unacceptable address:

1) Between 11th and 12th
2) P Street between 11th and 12th

6/103. 8 Entering Beat or Route Number

It is important for statistical purposes to know what beat or route a citation was written in, so officers shall indicate the correct beat route number the appropriate place on the citation. (On Handheld citations, this should be done automatically if entered correctly at the start of the shift.)

6/103. 9 Entering Officer Name

The handheld computer will enter the officer's name once set up properly at the beginning of the shift. The officer must clearly print their name on a handwritten citation.

6/103. 10 Notes

On both the handheld computer and the manual citation there is a space for remarks/notes. This space is to be used for pertinent information that may be necessary to further establish a prima facie case or to help the officer remember a specific incident or circumstance. PEOs should remember that citation notes can be reviewed during citation appeal or in Court, so notes should be business-like and relevant to the violation or the circumstances of its issuance.

Some comments that are helpful in upholding the validity of the citation include:

- "Sign visible-XX feet"
- "Meter working"
- "RO present/talked with PA".

6/104 Patrol Techniques

In order to effectively patrol an assigned beat/route the officer must become familiar with the characteristics of the area, the restrictions, and the sign posting's and so forth. The development each day of an enforcement plan ensures effective and efficient coverage. A part of this plan must include being on patrol during peak times, taking the break during quiet times (and when approved by the Manager) and ensuring that the Manager and fellow PEOs know that one is on break.

At the same time, to the extent possible and practical, it is desirable that officers do not patrol a beat in the same manner each day. If possible, PEOs should "mix it up" and vary the pattern by which they patrol a particular beat. This will both make the patrol day more interesting for the Officer and make it more difficult for habitual violators (such as meter-feeders) to "game" the system by anticipating when the PA will be coming down the street.

Chapter 7

Vehicle Towing/Impounding

7/100 General Provisions

For PEOs, the purpose of towing and impounding is to provide for the removal of the vehicles of habitual parking violators who have failed to respond appropriately to previous citations. Habitual violators are otherwise known as scofflaws and, per Program policy, must have accumulated three (3) or more unpaid parking citations, all of which must be more than 15 days old.

While the towing and impounding of another person's property becomes a service to the public, it also places a responsibility upon the Officer.

7/101 Authority to Tow/Impound

Illegally parked vehicles may be towed and impounded subject to the provisions of Norman City Ordinance Section 10. 44. 030 (insert correct ordinance number). Vehicles towed and impounded pursuant to this provision are subject to City rules, regulations and policies and/or approval by the City.

7/102 Verifying Need to Tow/Impound

Although a tow and impound may be authorized, it is not always mandatory. An officer must use good judgment in determining that a vehicle is in violation and should be towed and impounded.

The officer shall contact dispatch to verify necessary information. If the vehicle is being impounded as a scofflaw the officer shall ask violation bureau to check DMV records and the processing agency records. The checks are to determine if the vehicle is stolen, has outstanding citations or has been recently impounded.

Once all criteria have been met for the impounding and a determination has been made to tow and impound a vehicle, the tow truck is to be requested and the following steps are taken.

7/102. 1 Completion of Vehicle Tow/Impound Form

When towing and impounding a vehicle, someone's personal property is being taken. This creates an atmosphere for City liability and all due caution must be observed. A Tow Authorization Report shall be completed by the PA to indicate the date and time of the tow, who authorized it,, the location the vehicle was removed from, any damage to the vehicle at the time of impound, and any valuable items observed in the vehicle (such as cell phones, purses, or computers).

Once copy of the form is completed, the driver of the responding tow truck is required to sign the report indicating he is taking possession of the vehicle.

7/102. 2 Vehicle Inventory

When completing the Tow Authorization Form it is necessary to thoroughly check the condition of the vehicle and make appropriate notations. It is also necessary to note any items of value inside the vehicle by looking through the window and noting items on the form. Officers may only enter the vehicle when another officer or tow operator is present. At no time shall an officer enter a vehicle while alone.

7/102. 3 Processing the Impound Form

Upon completion of the tow, the officer clears the location and reports to the Police Service Desk so that if the vehicle owner reports the vehicle as stolen he/she can be informed that it was actually towed.

7/103 Stolen Vehicles

When the officer checks with the Violations Bureau to verify information on the vehicles and the information returns that the vehicles is reported as stolen, Officer will call Norman Police Department to report, advise location, and continue on patrol. For personal safety reasons, the officer should standby at a distance and be prepared to advise if the driver is present.

Chapter 8

Citation Adjudication

8/10 General Provisions

Parking citations may be contested in accordance with the administrative procedures outlined in the Nebraska Vehicle Code and local ordinance. In brief, a vehicle owner who wishes to contest a parking citation must first request a review of the citation with a representative of the City Attorney's office. It is possible that a decision might be held up pending research of a claim that a meter was not operational, or that proper signage was missing. If the City Attorney makes a decision to uphold the protest, the balance due is reduced to zero and the citation is considered dismissed.

If the City Attorney determines that the citation is valid, the respondent (customer) can either pay the fine or can request a hearing before a judge in County Court. It is quite possible that PEOs will be called upon to testify at County Court hearings under oath.

There are two things that PEOs can do both to reduce inconvenience to members of the public and see that legitimate violations are sustained once cited. First, PEOs should endeavor to always issue valid, legally sufficient citations. Second, they should always testify completely and truthfully in County Court as required.

8/107 Establishing a Proper Case

To ensure that citations are upheld during the initial administrative review process and the subsequent Hearing process, it is important for officers to complete each citation clearly and legibly, with all proper information required to establish the violation, and issued for the proper violation based on the facts the PA observes. Finally, all citations must be signed by the officer.

8/108 Testimony in Court

It is also critical that officers testify properly in Court when required. Elements of proper Court testimony include the following:

> Appearing on-time and at the designated place. (Officers will be informed in writing about required Court appearances.) Presenting a professional appearance that reflects well on the PA and the program. (This includes both good grooming and proper attire consistent with the requirements stated previously in this manual.)
>
> Answering all questions directly and accurately. Officers must tell the truth and only respond to the exact question asked. They are not to embellish, offer their personal opinions, or provide answers beyond the question asked. They should return to the office as soon as told by Court personnel that they are no longer required.

8/109 Understanding the Difference between Citation Issuance and the Results of Administrative Reviews and Court Hearings

It is important that each PA appreciate that subsequent dismissal of a citation which he/she wrote is not a negative reflection. The nature of our system calls for PEOs to make quick judgments in the field and issue citations based on the situations they observe, sometimes without all of the relevant facts known to them. Administrative reviews by the City Attorney and Court hearings allow citation recipients to put forward facts or evidence of which the PA might not have been aware. Thus, PEOs should not be concerned if they later hear that one of their citations has been dismissed.

Chapter 9

Manual Maintenance

9/100 Manual Issuance Procedures

Each manual will be numbered. Each person who is issued a manual will be required to sign for it. Each person who is assigned a manual will be responsible for the care, maintenance and updating of that manual. More significantly, offices are responsible for knowing the material in the manual and performing their duties in compliance with the manual. If there are any questions or uncertainty regarding what is expected, please ask the supervisor.

9/101 Manual Updating Instructions

As pages are revised or new pages are added, each manual holder will be required to sign for receipt of the update. The page numbering is used to locate the spot for new or revised pages. A revised page that is replacing an old page will have the same page number as the one it is replacing. To differentiate the replacement page from the old page, the replacement page will be coded with its effective date in the lower right hand corner.

When a revision requires more than one page it shall be numbered with a decimal such as 28, 28. 1, and 28. 2. When revisions occur, insertion instructions shall accompany the new pages.

9/102 Manual Revision Inserts

The new and revised pages are to be incorporated into the Parking Enforcement Manual. It is suggested that the old pages not be immediately discarded. Replaced pages should be filed in the rear of the binder along with this notice of manual revisions. These should be retained for reference purposes for six (6) months from the date above.

9/103 Manual Rewrites

Changes of policies and procedures as well as legislative changes may require a rewrite of certain portions of the manual. In order to ensure the immediate dispatch of new information to officers, Training Bulletins will be prepared and issued while manual updates are being prepared. Each Training Bulletin will indicate which Manual Chapter is being superseded or amended. As appropriate, a Manual rewrite will be completed to address the necessary changes.

Appendix 21

2012 Missoula Parking Commission Annual Report

2012 ANNUAL REPORT

missoula parking commission





TABLE OF CONTENTS

WHY PARKING MATTERS?

The International Parking Institute (IPI – of which the Missoula Parking Commission (MPC) is an active member) has a new ad campaign ("Parking Matters") that succinctly sums up what every parking and Downtown management professional knows to be true. However, the specifics about "how" and "why" need to be conveyed much more broadly and effectively. Disseminating this information locally is a role that the MPC will embrace going forward. The MPC has a great story to tell about how it has emerged as a valued and professional "partner for success" in Downtown Missoula and the larger community that it serves.

One of the on-going goals of this new Annual Report initiative will be to educate the community as to the growing importance and impact of the parking profession in the world at large. The report will annually summarize emerging trends and recent advances in the areas of parking planning, design, technology, communications, governance, community engagement, and a more strategic approach to parking management.

In this inaugural edition of the MPC Annual Report, a special emphasis will be placed on four key areas that have been explored over the past couple of years by the MPC staff and its Board of Directors:

- **Emerging Technologies –** We have been exploring the dynamic role of emerging technologies and their impact on our ability to provide enhanced customer service and improved program management.
- **Integrated Access Management –** We continue to emphasize the importance of broadening our scope to include an integrated approach to parking, transportation and demand management programs as a means of delivering more sustainable community access strategies.

INTRODUCTION

- **Parking and Economic Development –** We believe leveraging parking as an important community and economic development strategy is an important role for the Parking Commission. Working with our community partners, we will continue to explore the application of various parking management and community investment strategies for the overall benefit of our community.
- **Strategic Parking Management –** The MPC was a key funding partner of the Downtown Master Plan project a few years ago. One of the major outcomes for the MPC was the development of our first parking program "strategic plan". It was significant that this plan was an integrated element of the larger Downtown master planning process. Having this plan has been extremely beneficial in guiding the direction and annual work plans of the MPC. Most of the major priority action items within the strategic plan have been accomplished. Updating the MPC strategic plan is a priority for the Board in 2013.

Other areas of focus for 2013 will be our relationships with related associations and professional organizations. We will continue to explore the huge potential for shared benefits that can be realized through improved connections, shared resources, and enhanced community collaboration.

Ultimately, one of our key focus areas is to increasingly embrace our role in contributing to the overall "Downtown Missoula experience". There is a growing respect for the complexity and multi-faceted nature of both parking and downtown management. Strategic communications, effective collaboration, and enhanced customer services are keys to success.

In early 2013, with the opening of the new "Park Place" garage at the corner of East Front and Pattee Streets, the community will see the realization of the largest single project to date from the MPC and the largest project to date to grow from the Downtown Master Plan.

To quote Oliver Wendell Holmes, Jr., "A mind that is stretched by a new experience can never go back to its old dimensions." The MPC plans to keep on stretching!

A Message from MPC Director, Ms. Anne Guest

The last several years have been filled with significant accomplishments for the MPC. Collectively, they have enhanced our overall parking program and have positioned the MPC to be a major partner for economic development in downtown Missoula.

One significant catalyst for these accomplishments has been the Downtown Master Plan that was approved by the City of Missoula (City) Council in 2009. An integral part of the Downtown Master Plan was the development of a Parking Strategic Plan that included the establishment of ten program guiding principles and wide range of specific recommendations.

The Downtown Master Plan identified a core area in the downtown as a "retail hot spot" and recommended the development of a new parking structure at the corner of East Front and Pattee Streets. In response to that, the MPC along with the Missoula Redevelopment Agency successfully negotiated and financed a new parking structure, "Park Place", at this location. It is designed to support the First Interstate Bank Project while providing additional parking supply to serve the development of the Missoula Mercantile while also providing shared parking for the many evening and weekend events in Caras Park. Park Place will be completed by the beginning of 2013, adding 336 new parking spaces to our downtown inventory. It will be a tremendous asset to the Missoula community.

Most of the other Parking Strategic Plan recommendations have been completed, taking our parking program to a new level. However, there is more work to be done. One of the goals for this upcoming year is to replace the old mechanical meters with new multi-space parking technology that will offer an exciting array of new payment and user-friendly program options for downtown patrons.

I would like to thank our Board of Directors, our dedicated staff, and our community partners for their support and hard work over the past few years. We are very proud of our parking program and look forward to continuing to develop innovative and customer-friendly programs to support downtown Missoula as one of the most vibrant and exciting downtowns in the state.

Anne Guest
Director, Missoula Parking Commission

INTRODUCTION

A Message from MPC Board Chair, Mr. Rod Austin

The MPC is an active partner in many downtown and community interests, including being a significant partner in the Downtown Master Plan. Over the past three years we have worked hard at the many parking and mobility-related tasks associated with the Downtown Master Plan. The MPC has been a leader in keeping that plan relevant and alive through our community investments and on-going planning initiatives. The MPC has also embraced economic development as a core element of our overall mission in support of the downtown's larger strategic goals.

Key to this thinking is embracing an approach where parking is directly linked to and actively engaged with other local agencies and organizations whose primary objectives are downtown management and community development. This includes organizations like the Missoula Downtown Association and the Missoula Redevelopment Agency, City Planning and Public Works, and a variety of community mobility partners.

As part of our economic development mission, we want to stimulate future community development by leveraging parking development and strategic investments in land acquisition. These activities will include partnerships with other public agencies and/or private development and will encourage the creation of new mixed-use projects, the promotion of adaptive reuse and infill development, good urban design, and the creation of walkable and inviting "people places". The new Park Place project is a first step in this direction with the creation of street-level retail space in conjunction with needed parking infrastructure on the corner of East Front and Pattee Streets.

The MPC will also continue its leadership role in efforts to create a balanced parking and transportation system for the City. We will work closely with Mountain Line, Missoula In Motion, Missoula Ravalli Transportation Management Association (MRTMA) and other local agencies to develop a more integrated and comprehensive mobility management system for the greater Missoula community. This will be critical as Downtown Missoula works to build retail, residential, and employment opportunities. Supporting multiple modes of access is good for business, the environment, and the overall quality of life that makes Missoula a special place. The MPC is proud to be an active partner in the success of Downtown Missoula.

Rod Austin
Board Chair, Missoula Parking Commission

ABOUT THE MPC

Purpose

The MPC works with government, businesses, and citizens to provide and manage parking and parking alternatives. MPC identifies and responds to changing parking needs in the area for which it is responsible.

Overview

The MPC has for years been a well managed and progressive parking and transportation program. In addition to the management of significant on- and off-street parking assets, the MPC also actively participates in a variety of community transportation initiatives in collaboration with Missoula in Motion, Mountain Line (Missoula Urban Transit District) and the MRTMA.

Awards

As a key partner in a comprehensive downtown master plan, the MPC has been a community leader in master plan implementation, including the introduction of new "downtown-friendly" parking policies, new technology, expanded support for transit and transportation alternatives programming, and an aggressive investment in new parking infrastructure, despite an economy in recession.

- 2010 – The Missoula In Motion Best Practices Award Finalist was awarded to the Downtown Streetscape Consortium, which included the MPC.
- 2011 – The MPC was honored by the International Downtown Association highlighting the positive community benefits that can occur when a progressive parking and transportation management organization works collaboratively with downtown management groups, urban renewal agencies and the overall community.
- 2012 – The MPC was awared the 2012 International Parking Institute (IPI) Award of Merit for its *"Integrated Downtown Master Plan and Parking."*

IDA DOWNTOWN ACHIEVEMENT AWARDS

PARTNERSHIPS FOR SUCCESS

One of the characteristics that sets the MPC apart from most parking programs in the country is its level of community engagement. The MPC is involved in a wide range of community initiatives and is actively involved with almost every community development agency and significant institutional organization. According to MPC Board Chair Rod Austin, much of this credit belongs to MPC Director Anne Guest, however, she also has strong support from the MPC Board of Directors who clearly see the value of strong community engagement.

There are strong and effective working relationships between the MPC, the primary downtown management, redevelopment, transportation, and other City agencies whose job it is to make Missoula a world class community.

The MPC is also actively involved with the University of Montana, Hellgate High School, St. Patrick's Hospital, the Hip Strip Neighborhood, Missoula In Motion, Mountain Line, and the MRTMA, just to name a few.

This type of consistent, high level engagement helps ensure that the parking program is connected, better understood, and respected as a community partner and leader.

The MPC is not only engaged in the planning and operational contexts, but they have proven to be an effective contributor in the community and economic development arenas as well. Early in 2013, the community will be invited to the grand opening of the MPC's largest capital project to date—the new Park Place garage.

Downtown Business Improvement District

Missoula Redevelopment Agency

Missoula Parking Commission

Missoula Downtown Association

CURRENT PROGRAM SUMMARY

Overview

The MPC is the city department responsible for parking operations, maintenance, and enforcement within Missoula's central business district (CBD) and around the University of Montana. The MPC oversees 15 parking facilities in the downtown core, the Residential Parking Permit Program (RPPP), meter collections, maintenance and enforcement, and the issuance of permits for disabled, commercial, and loading zone spaces. The MPC has established itself as more than just an organization that provides parking for vehicles. The MPC is striving to be an active and collaborative partner with other organizations to develop and promote strong parking, transportation alternatives and transportation demand management strategies.

Jurisdiction

The MPC's jurisdiction includes two basic areas:

- The Central Business District, including the area downtown where the meters are located
- The Residential Parking Permit Program (RPPP), adjacent to the University of Montana

Organization

The MPC is governed by a Board of Directors consisting of five members with four-year terms. The Board members are recommended by the Mayor and approved by the City Council and are required to be residents of the City. The Parking Commission works in coordination with the City Council to further the transportation and economic goals of the City, especially the downtown.

The City of Missoula's parking organization is "vertically integrated" under the leadership of the MPC Director. (i.e., on-street, enforcement, off-street operations and planning are managed as one unit). The Director reports to the MPC's Board, and the position also serves as an ex-officio board member of the Missoula Downtown Association. The MPC Director also takes counsel and advisement from the Missoula Redevelopment Agency (MRA).

The MPC is comprised of eleven full-time equivalent (FTE) employees and one half-time employee under the following operating and service entities;

- Administrative Group (4 FTE)
- Parking Enforcement Group (3 FTE)
- Parking Operations / Maintenance Group (3 FTE)
- Booth Attendants (1.5 FTEs)

The parking Operations/Maintenance and Administrative groups are the largest sections each with approximately 36% of the staff, while the Enforcement Group comprises approximately 28%. Each Group has clearly defined tasks and responsibilities under the leadership of a supervisor who reports to the MPC Director.

Key Program Elements

Overall Parking Resources

The MPC manages approximately 3,000 on-street and off-street downtown public parking spaces of which 11% were provided in structured parking facilities (not including the new Park Place garage scheduled to open in early 2013). The table below provides a breakdown of parking spaces by type.

MANAGED MPC PARKING RESOURCES OVERVIEW

	Number of Facilities	Spaces	% of Total Spaces	Number Permits Issued
	OFF-STREET			
SURFACE LOTS	13	787	26%	627
GARAGES	2	325	11%	280
TOTAL OFF-STREET	15	1,112	37%	907
	ON-STREET			
METERS		1,075	36%	N/A
RPPP		820	27%	1,100
TOTAL ON-STREET		1,895	63%	1,100
TOTAL ON-STREET AND OFF-STREET		**3,007**	**100%**	**2,007**

Off-Street Parking Facilities

In 2012 the MPC owned/managed two parking structures and 13 surface lots. Three surface lots (Greyhound, Caras Park, and Woody) allow hourly parking through the use of meters and contain a total of 45 meter spaces. All other surface lots are designated for monthly parking.

On-Street Parking

There are a total of 1,075 metered on-street parking spaces in Downtown Missoula, 820 Residential Parking Permit Program (RPPP) spaces near the University of Montana, and an additional 714 on-street spaces that are unsigned, signed with time limits, or designated as loading zones.

The table below summarizes parking spaces by type and area.

TOTAL PARKING SPACES BY TYPE/AREA				
	OFF-STREET		ON-STREET	TOTAL
	PUBLIC	PRIVATE		
DOWNTOWN CORE	631	1,433	872	2,936
E. DOWNTOWN	51	396	499	946
FRONT STREET	37	652	125	814
CARAS PARK	300	134	31	465
HIP STRIP	93	611	368	1,072
TOTAL	**1,112**	**3,226**	**1,895**	**6,233**

Residential Parking Permit Program

MPC's RPPP zone is shown in the figure below. The MPC's jurisdiction includes 820 residential parking permit spaces adjacent to the University of Montana.

New Facility Development

One of the primary responsibilities of the MPC is to plan for, finance, and construct new parking infrastructure.

Having been a good steward of parking revenues for many years, the MPC is excited to be opening their newest and largest parking facility to date with the new Park Place garage in early 2013.

On the following page are a few photos tracking the progress of the garage from the earliest days of construction.

Photos of the Park Place Garage During Construction















FINANCIAL OVERVIEW

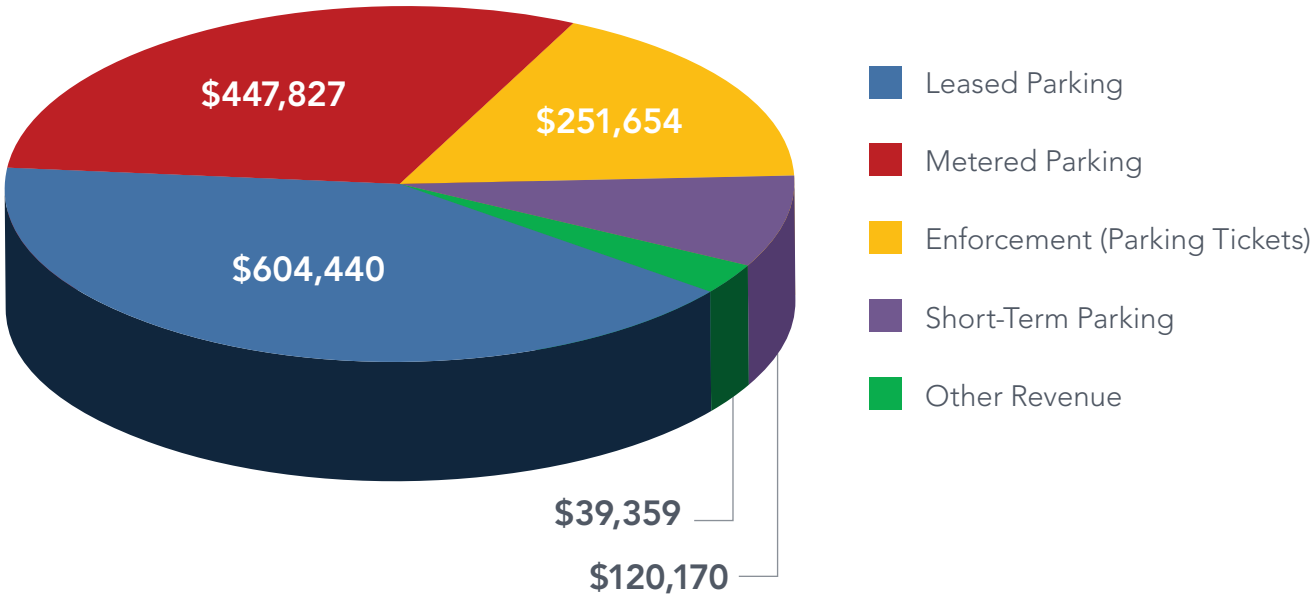
From a high level perspective, the parking program's financials can be summarized into two major categories – "revenue by type" and "expenses by major categories". These two categories of financial data are summarized below:

Revenue by Type

The figure below illustrates the MPC's FY 2012 revenue budget. This figure breaks out revenues by category; excluding non-parking related revenues. Based on the FY 2012 data, the "leased" and "metered" revenue categories generate the majority of the program revenue.

Revenue by Major Categories

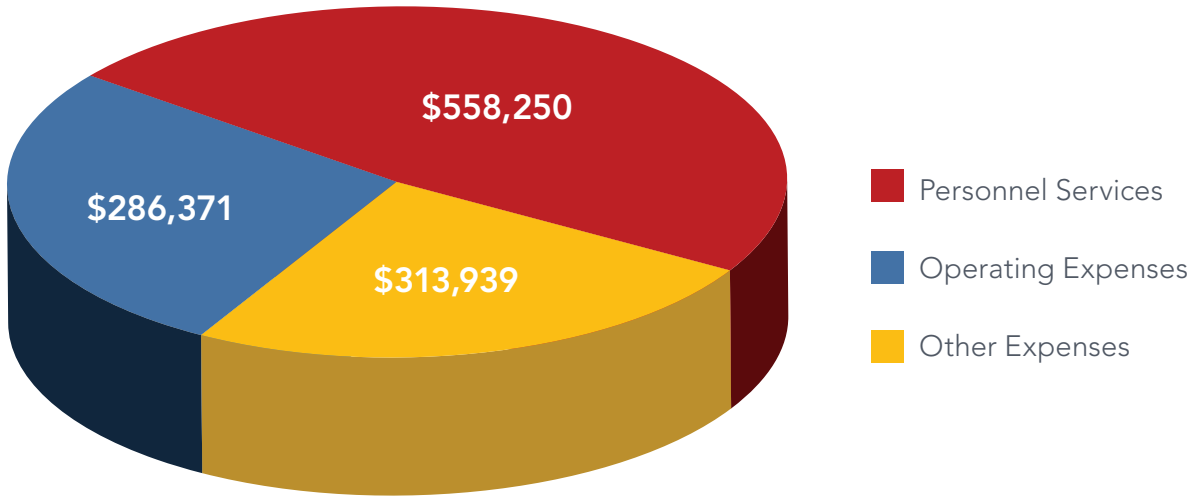
Leased Parking	$604,440
Metered Parking	$447,827
Enforcement (Parking Tickets)	$251,654
Short-term Parking	$120,170
Other Revenue	$39,359
TOTAL	**$ 1,463,450**



Expenses by Major Categories

The amended 2012 MPC expense budget totaled $1,158,560. The "Personnel Services" category accounted for largest percent of the expenses (48%) followed by "Other Expenses" (27%) and "Operating Expenses" (25%). A more detailed breakdown of expenses is provided on the following page.

Personnel Services	$558,250
Operating Expenses	$286,371
Other Expenses	$313,939
TOTAL	**$1,158,560**



On the following page is a summary of the audited financial statements of the MPC dated June 30, 2012. The draft financial statements were prepared by the firm Junkermier, Clark, Campanella, Stevens, PC of Missoula, Montana and were submitted to the MPC Board on August 9, 2012.

MPC EXPENSES – JUNE 30TH, 2012

PERSONNEL EXPENSES	
Salaries	$384,846
Employer Contributions	$173,404
TOTAL PERSONNEL EXPENSES	$558,250
OPERATING EXPENSES	
Outside Labor	$5,750
Office Supplies	$7,059
Operating Supplies	$10,720
Special Clothing	$2,581
Gas and Diesel	$7,524
Postage and Freight	$14,745
Printing - General	$8,676
Printing - Tickets	$12,582
Publicity and Subscriptions	$2,711
Business Promotions	$15,419
Transportation Demand Management (TDM)	$21,000
Electricity	$39,008
Water	$(2,194)*
Telephone	$4,797
Garbage	$1,467
Prof. Fees Misc.	$35,158
Prof. Fees Acct.	$18,018
Prof. Fees Audit	$11,165
Central Park Security	$5,478
State License Inquiry	$905
Internal	$11,488
External	$13,289
Parking Structures	$8,077
Bank Street Repairs	$63
West Broadway	$7,650
Bridge	$6,986
Midtown Lot	$4,950
Travel and Per Diem	$1,073
Education and Training	$395
Collection Bureau Expense	$1,283
Property Taxes and SID	$8,482
Bank Charges	$66
TOTAL OPERATING EXPENSES	**$286,371**

*Refund for non-functional water line

MPC EXPENSES – JUNE 30TH, 2012 (CONTINUED)	
OTHER EXPENSES	
City Contract	$149,812
Bond Interest Expense 2010A	$11,759
Bond Amortization Expense	$18,718
Depreciation/Amortization Expense	$133,650
TOTAL OTHER EXPENSES	**$313,939**

KEY FINANCIAL METRICS (5 YEAR COMPARISON)	2012	2011	2010	2009	2008
Total Parking Revenue	$1,463,450	$1,306,657	$1,402,318	$1,439,912	$1,475,308
Total General Expenses	$844,619	$947,789	$858,587	$920,786	$1,005,428
Total Other Expenses	$313,939	$337,451	$323,057	$338,455	$302,734
Net Operating Rev/(Loss)	$280,171	$3,150,417	$276,873	$347,809	$331,700

CAPITAL PROJECT – PARK PLACE	
Cash Reserve Fund	$2,500,000
Revenue Bonds (supported by parking revenues)	$4,500,000
Missoula Redevelopment Fund (MRA) TIF funds	$3,000,000
TOTAL CAPITAL	**$10,000,000**

PLANNING

Parking Strategic Plan

As mentioned in the introduction, the development of a Parking Strategic Plan as an integrated element of the larger Greater Missoula Downtown Master Plan was an important planning element for the MPC. The MPC adopted a strategic framework of ten Guiding Principles as part of the 2008 plan that aligned parking philosophies and programs with the larger downtown strategic goals and objectives.

The following nine primary action plan items formed the initial MPC work plan:

1. New Parking Facility Planning and Development
2. Adjust Parking Rates and Fines
3. Invest in New Parking Technology
4. Continue to Support and Invest in Multi-modal Access Strategies
5. Develop More Open and Collaborative Public Processes
6. Focus on Economic Development Support Strategies
7. Implement Recommended Retail Parking Strategies
8. Parking Program Growth/Expansion
9. Parking Program Marketing

Seamless Integration of Downtown Master Plan and Parking and Transportation Strategic Plans

Strategic Plan Implementation

The MPC moved quickly to implement its primary strategic plan action items and generate momentum for overall Master Plan implementation.

The strategic plan implementation involved transportation, parking and access elements that led to improved economic development and renewed vitality of Missoula's downtown.

Capital Investment Projects

The most significant parking program action item was an initiative to embark on a capital investment program to support the overall Master Plan development strategies. This program, while stretching parking program finances, is currently being implemented and the new Park Place garage is the largest single Master Plan implementation project to date.

The investment in a multi-million dollar design and construction project in the heart of a recession was both important and smart. This investment generated jobs in the local economy when it was most needed and leveraged their capital assets while design and construction services were at the lowest prices in decades—creating even greater project value.

The new parking structure project has generated an exciting and original design that incorporates good urban design principles, sustainability elements as well as creative façade treatments designed to integrate the structure with the surrounding Montana environment.

New Technology Investments/New Downtown-Friendly Policy Investments

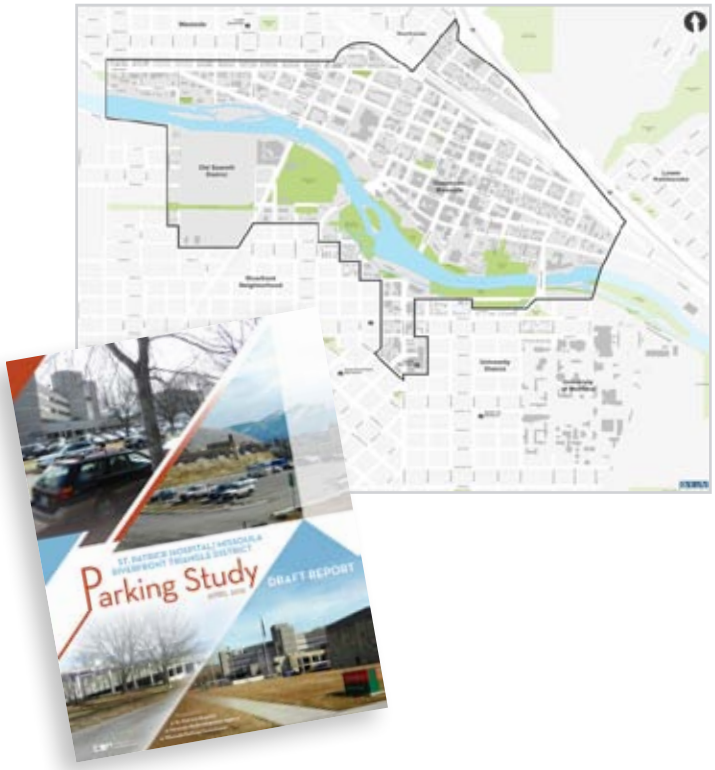
In addition to the new parking garage, several other investments in new technology and management programs were initiated. Some these investments included:

- A pilot program to replace 40 old mechanical parking meters on North Higgins Avenue with new credit card enabled meters
- Implementation of First Hour FREE Parking in Central Park Garage to compliment the existing validation program
- Replacement of old parking pay-stations in New Park lots and the Bank Street Parking Structure
- Adjusted parking rates to support parking capital infrastructure investments
- Implemented new fine structure in 2012

Other Planning Initiatives

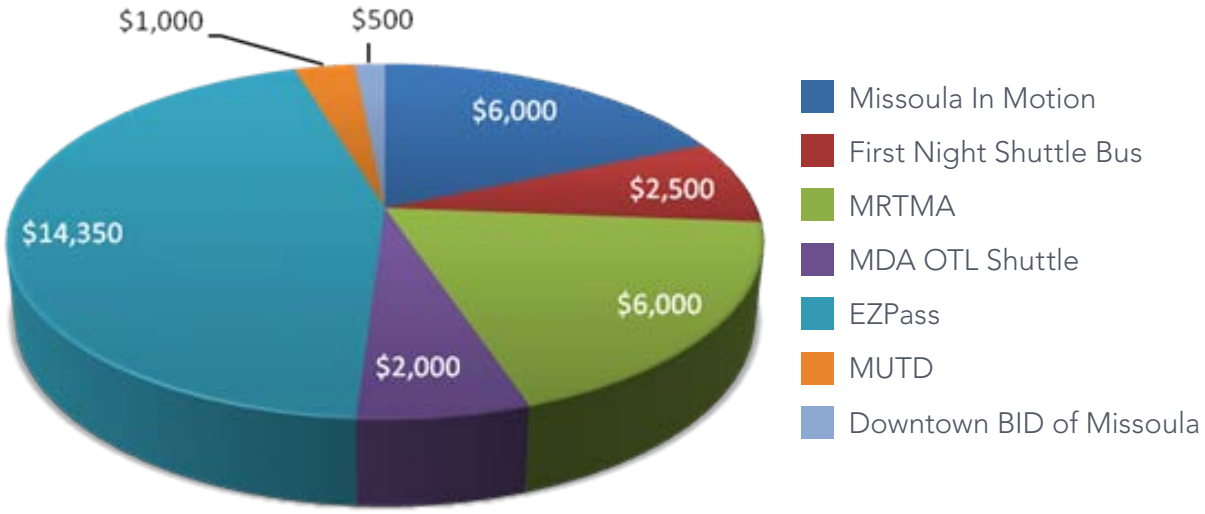
The MPC partnered with the Missoula Redevelopment Agency and Providence Health and Services – Montana (St. Patrick Hospital) to fund a parking study for the "Riverfront Triangle Urban Renewal District" (the "District") and the adjacent St. Patrick Hospital campus located in Missoula, Montana.

The overall goal of this project was to assist St. Patrick Hospital, the MRA, and the MPC in assessing current and future parking needs related to the development of the District and a defined area adjacent to the district. The study area included the main campus of St. Patrick Hospital and the neighborhoods to the north and northwest of the hospital.



LARGER COMMUNITY TRANSPORTATION SUPPORT

The MPC actively participates in a variety of community transportation initiatives in association with Missoula in Motion, Mountain Line and MRTMA. In 2011, MPC funded approximately $32,350 to support Transportation Demand Management (TDM) efforts.



Missoula in Motion runs the TDM program. The program is designed to help businesses and employees save money and time while helping to maintain the quality of life in Missoula. The TDM programs help curb parking costs, improve employee productivity, realize tax benefits, and free up spaces for customer parking. Currently 4,835 members are signed up for the Momentum program.

The MRTMA works in conjunction with Montana Department of Transportation to develop comprehensive transportation alternatives to reduce traffic and parking congestion. MRTMA provides transportation choices for citizens of Missoula, Ravalli, and Lake Counties, including employer TDM programs, carpool and vanpool programs, guaranteed ride programs, school outreach, and park and ride sites.

Mountain Line is the public transit agency, providing service to Missoula and the University of Montana. Mountain Line operates fixed-route and para-transit bus service in and around Missoula and offers a car free way to get around Missoula. Service between downtown and the University of Montana has helped both areas address parking and congestion issues.

SUMMARY OF PROGRAM ACCOMPLISHMENTS

- Participation and funding support for the Greater Missoula Downtown Master Plan by the MPC was a significant and important investment that is paying positive dividends for the agency and the downtown.
- The significant community engagement process has created strong momentum and a consensus for action.
- The investments made by the MPC are helping keep Master Plan momentum alive and are helping to stimulate new economic development opportunities.
- Investments in new parking technology are creating positive downtown customer service enhancements.
- The strategic decision to reinvest parking system revenues to support downtown development projects is an important practice that will have long-term positive impacts on the downtown.
- By adopting a more strategic approach to downtown access management, the MPC is positioned to be a more engaged and effective downtown community member as well as being an active partner in community and economic development.
- The MPC should be applauded for its progressive approach to supporting an integrated approach to parking and transportation alternatives.
- The MPC has moved quickly and aggressively to implement its primary strategic plan action items and has thus adopted a leadership position within the downtown community.
- The investment in the new Park Place garage is the largest and most significant project-to-date for the MPC. The timing of this multi-million dollar design and construction project, during the heart of a major recession, helped to generate local jobs and boost the local economy when it was most needed. The MPC's quality management and fiscal prudence over many years has resulted in this important investment in downtown Missoula; an investment that reflects the organization's growing focus on being an engaged and contributing community partner in the area of economic development.

MPC BOARD AND STAFF

Ms. Anne Guest,
MPC Director

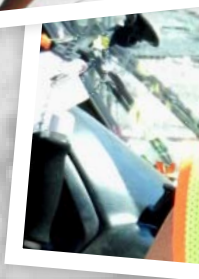
Mr. Rodney Austin,
Board Chair

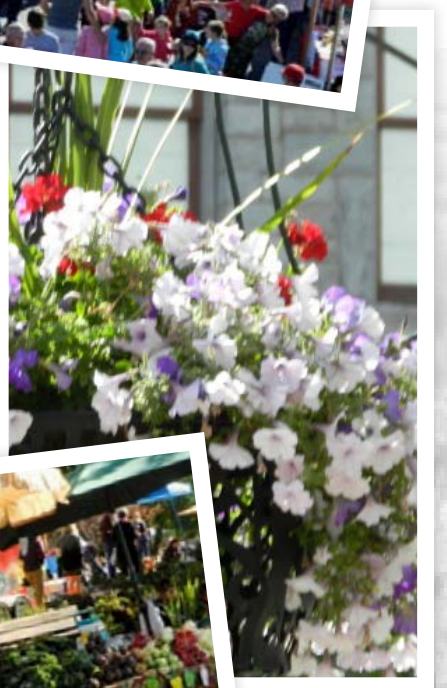
Ms. Theresa Cox

Ms. Carol Williams

Mr. John Smith

Mr. John Roemer





missoula parking commission

Appendix 22

New Parking Manager Integration Strategy

APPENDIX 22

New Parking Manager Integration Strategy

This document was developed for another community that was planning to hire a new parking manager. This is being provided to Cleveland County and the City of Norman only as a reference document that could apply to the recommendation to hire a parking manager. This document lays out a proposed timeline for the integration of the new Parking Manager. Its format is a high-level overview of major tasks that need to be accomplished within the first month, first 3 months, first 6 months and major goals to be accomplished in the first year.

First Month

A - 1 Standard City new employee orientation.

A - 2 Provide the new manager with previous studies and planning documents related to parking and transportation.

A - 3 Meet with local private parking operators.

A - 4 Conduct a critical assessment tour of parking facilities.

A - 5 Conduct a safety and security audit of all parking facilities. Address areas of concern. It may be good to do this with the assistance of the Norman PD.

A - 6 Meet with other community groups and partners.

A - 7 Meet with current City department managers and discuss transition plans.

A - 8 Conduct an in-depth review of current parking management contracts, leases, etc.

A - 9 Initial introductory meetings with key downtown stakeholders.

A - 10 Meet with City planning officials to discuss future parking system expansion plans and other downtown development plans that will impact parking.

A - 11 Meet with City departments responsible for marketing and public information to discuss how parking can be included in marketing materials and programs.

Within the First Three Months

B - 1 Review proposed program Vision/Mission Statements for the Parking Department. Modify as needed and adopt.

B - 2 Assess parking system organization, work plans and staffing needs for the next 1 - 2 years. Make recommendations and hire needed staff.

B - 3 The Parking Strategic Plan provides a prioritized action plan for implementing changes to parking system management, technology, etc. Review and modify action items timeline based on staffing and other resource availability.

B - 4 Identify "low hanging fruit" and develop a checklist for accomplishing tasks that can completed with the next three months. Look for items that can show that positive change

is occurring. (For example, employing the “First 30 Foot Principle” related to garage entrances and exits).

B - 5 Critique parking technology currently in use. Develop a detailed inventory of all existing parking and access control equipment.

B - 6 Begin assessment of parking system marketing and branding.

B - 7 Continue meetings with key downtown stakeholders - identify critical issues to be addressed with each group.

B - 8 Begin development of plans to update all position descriptions, operational policies and procedures, etc.

B - 9 Analyze and flow chart current parking system revenues and expenses - begin process of creating a consolidated financial report (see template provided).

B - 10 Register for membership in the International Parking Institute (IPI) and the Pacific Intermountain Parking and Transportation Association (PIPTA). Begin meeting with near-by parking program peers.

Within the First Six Months

C - 1 Begin development of a parking technology plan. Identify technology enhancement goals and objectives.

C - 2 Create first draft of a parking technology capital budget.

C - 3 Finalize parking system consolidated financial reporting plan.

C - 4 Develop consolidate parking program budgeting process.

C - 5 Begin development of parking program comprehensive facility maintenance plan

C - 6 Gather information on existing parking facility warranties and develop a schedule to conduct walk-through evaluations of warranty items six months prior to warranty expiration (expansion joins, sealants, lighting fixtures, etc.),

C - 7 Identify facility maintenance critical issues. Evaluate the potential need for a parking facilities condition appraisal.

C - 7 Begin development of parking program capital facilities plan.

C - 8 Conduct a parking market rate assessment and evaluate a potential “first hour free” program for downtown lots/garages.

C - 9 Conduct a review of on-street parking and parking enforcement policies and practices. Detailed templates for a parking enforcement manual and parking enforcement audit program are provided as appendices to the parking strategic plan.

C -10 Begin the process of developing an Annual Parking Report to keep County/City management updated on departmental goals, objectives, plans and accomplishments. A template for such a report is provided as appendix item in the parking strategic plan.

C -11 Begin evaluating opportunities for parking to work with and support larger downtown transportation and access issues, including transit, transportation alternatives, signage and wayfinding, etc.

C -12 Assess Parking's role in supporting downtown special events. Develop or refine specific parking special events policies. Work closely with the Norman Downtowners.

C -13 Assess current parking revenue control processes. Work with the City's Auditing Department to develop procedures for conducting annual parking audits. Consider engaging a parking consultant to conduct an external parking system operational audit.

C -14 Create detailed operations manuals for all City Parking facilities. A template for a facility operations manual is provided as appendix item in the parking strategic plan.

Within the First Year

Major goals to be accomplished within the first year:

- Make significant progress is assessing all on and off-street parking management activities. Make recommendations regarding needed improvement and departmental staffing needs. Implement process improvements.
- Develop a parking peer network as an additional tool to increase parking knowledge. Conduct peer program reviews by visiting the programs of the parking advisory panel participants.
- Conduct a safety and security audit and identify and resolve any significant security and risk management concerns.
- Develop effective working relationships with key downtown stakeholders. Work collaboratively to resolve major operational issues and begin development of a strategic approach to position parking as a positive asset in support of larger community goals and objectives.
- Develop a comprehensive parking facilities maintenance plan.
- Begin development of a defined parking planning function and become an active partner in downtown planning efforts.
- Conduct a parking market rate survey and make recommendations regarding parking rate setting guidelines. Evaluate parking validation alternatives.
- Develop a consolidate parking financial statement and monthly management/financial reporting package. Develop consolidated parking department operations and capital budgets.
- Review and evaluate the scope of future departmental operations including an evaluation of on-street parking and enforcement responsibilities.
- Begin development of parking system branding and marketing program.
- Develop an Annual Parking Report. (See template and sample provided.)

This plan may be overly aggressive, but all of these items need to be addressed. It may simply be a matter of the degree to which they are addressed. The new parking manager will need time to get situated into his/her new role and environment, develop new relationships, and begin building a strong background of industry knowledge.

Appendix 23

White Paper: Enhancing Parking Facility Security

KIMLEY-HORN AND ASSOCIATES, INC.

Parking Planning White Paper Series

ENHANCING PARKING Facility Security And Assessing Security Program Effectiveness

Kimley»Horn

ENHANCING PARKING Facility Security And Assessing Security Program Effectiveness

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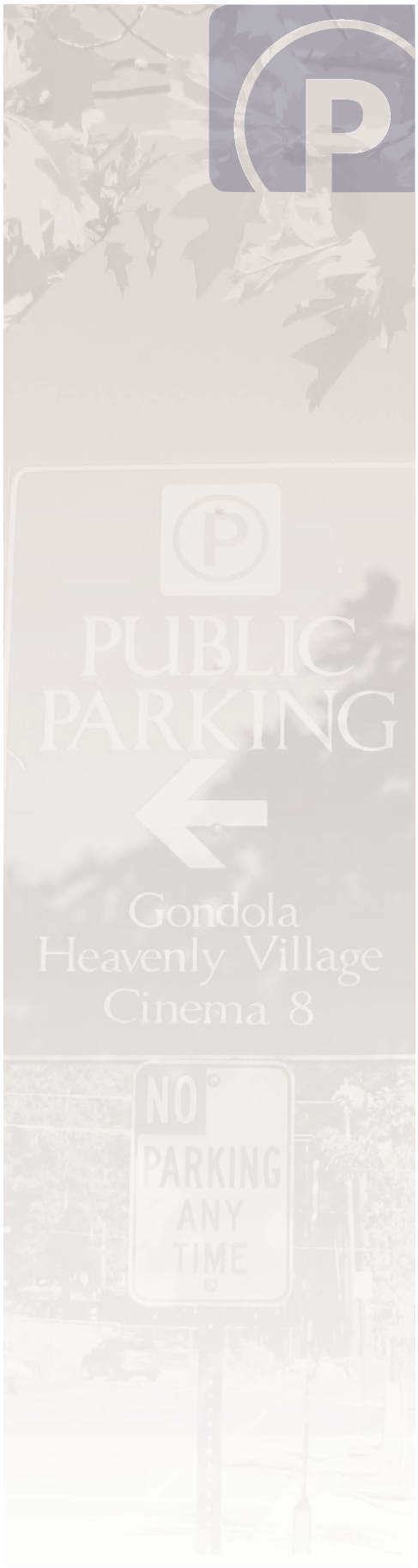


Foreword

This article on parking facility security is presented in two parts. The first part reviews basic security concepts specific to parking facility management and parking facility design. The second part provides a detailed look at assessing security programs in general.

Part One

Enhancing Parking Facility Security

Security within parking facilities is always a major concern. Statistically, over 90% of people attacked in parking decks are women who are alone. The longer they are alone the more at risk they are. The negative publicity associated with this type of crime can damage any business or institution. Liability is a key concern for garage owners and operators. There are many security techniques available for owners or operators of parking lots or garages. Most are common sense; others involve design issues that should be evaluated in the planning phases of new garage development.

Security techniques related to parking facilities are classified as either "*ACTIVE*" or "*PASSIVE.*" Active security is defined as any technique requiring a human response, such as security patrols, guards, or audio-visual surveillance. Any device or technique not requiring a human response, such as lighting, fencing, glass-backed elevators and stairwells, etc. is defined as passive security. Passive security is more cost effective, and if done well, contributes to a patron's feeling of safety and comfort within a facility.

A facility designed with security in mind can incorporate many passive security features into the construction of the garage and minimize active security costs. Among the features to be considered in the design/development phase of a new parking structure are:

Clear-Span Construction

Clear-span construction techniques reduce the number of columns within the structure creating better visibility and eliminating potential hiding places. In addition to these passive security advantages, the increased floor to ceiling height adds to improved facility wayfinding though enhanced signage placement options. Much depends on the structural system used.

External Ramping Systems

Some sites are well suited to a design that allows flat plates for parking with vertical ramping being external to the structure. This design increases visibility within the structure and has other way finding and pedestrian circulation advantages. In larger facilities, the same effect can be achieved even with internal ramps as illustrated in the photo below.

Glass-Backed Elevators and Stairwells

In general, the more open and visible confined spaces can be made the better. The general theory is that the criminal is less likely to attack standing in front of a window or open stair than in an enclosed area.

Security Screening/ Limiting Access Points Into The Facility

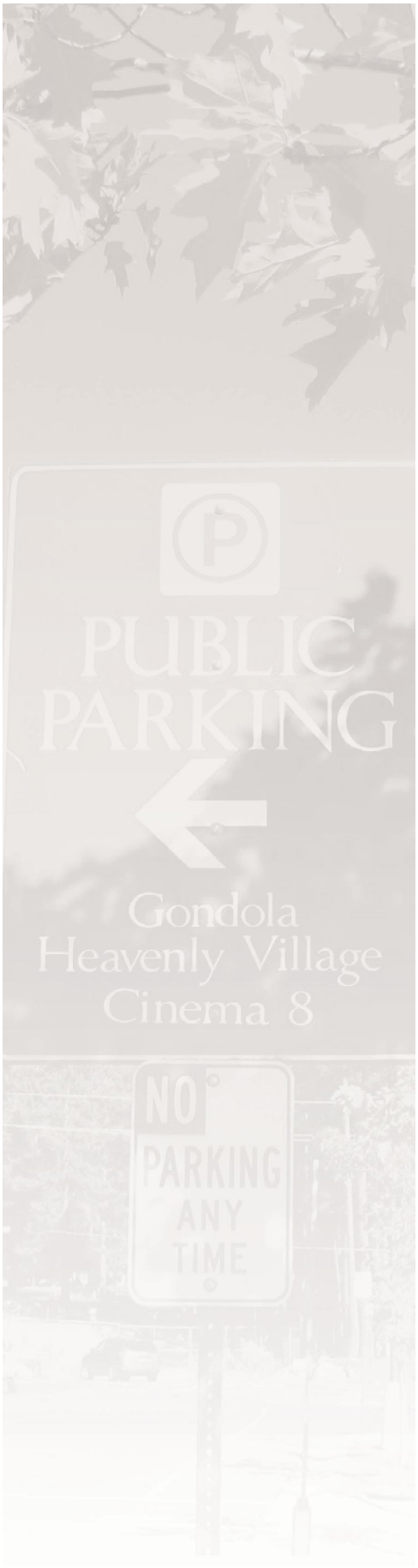
Restricting access to the parking facility on the lowest levels through the use of architectural screening or fencing better controls access into a structure and funnels pedestrians through designated points that can be more easily monitored. In addition, securing potential hiding places such as areas below stairs enhances facility security.

Lighting Design

Lighting is universally acknowledged as the most important security feature in a parking facility. Eliminating dark areas deters crime and promotes enhanced user comfort and improves the perception of safety. Good lighting permits the safe movement of pedestrians and vehicles within the parking facility, and it promotes internal facility way-finding.

Light levels are generally not mandated by the building codes, other than certain minimum levels required for emergency egress. The industry standard for lighting design in parking facilities is established by the Illuminating Engineering Society of North America (IESNA). While not a legal building code, failure to comply with IESNA standards does carry significant liability.

The IESNA standards are defined in terms of illuminance, or, in other words, the amount of light falling on an object. In general terms, parking structures require a minimum illuminance of 1 foot-candle and 10:1 maximum to minimum ratio for uniform light distribution. Stairways and lobbies require 2 foot-candles minimum. Vehicle entries and exits require 50 foot-candles during daylight hours to allow for safe transition from bright sunlight to the interior space.



Typically, the white light provided by metal halide or florescent lamps is more comfortable to patrons because it is perceived to be brighter. Currently, florescent lighting is the least expensive lighting type to operate, due to lower energy demand and longer lamp life. Recent innovations have also made florescent fixtures more effective in cold weather climates.

Ideally, fixtures should be paired in each parking bay, spaced at approximately 30 feet on-center in each direction. This somewhat mitigates the shadows created by the parked cars, as well as reducing the lighting glare in the drive aisles. The paired fixtures improve the uniformity of the lighting and allow for a certain amount of forgiveness if a single lamp fails.

When used in conjunction with CCTV systems the color rendition of the lighting should be considered (for example, the whiter light produced by metal halide lighting may be preferable to the yellow tinted light produced by High Pressure Sodium fixtures if color cameras are used).

Security Office

Locating a security office within the parking facility adds significant security presence within the garage. This is especially effective if camera monitoring is visible by garage patrons.

Landscape Design

Landscaping should be kept low to the ground to minimize hiding places around the deck. Placement of trees, shrubbery, and hedges can also restrict line of sight vision for turning traffic if inappropriately placed or allowed to grow too tall, causing a safety hazard.

Other Security Enhancements

- Painting the interior of the facility improves the "feel" of the deck. Painting or staining interior surfaces white makes better use of existing lighting by increasing reflectivity.
- The addition of convex mirrors in elevator cabs allows patrons to see, before entering, if anyone is hiding inside the cab.
- In general, eliminate hiding places within and around the garage. Small areas can be enclosed with chain link fencing to create storage areas and at the same time eliminate potential hiding places.
- Installing glass panels in stairwell doors improves visibility. (Check with local codes on whether stairwell doors are required to be fire rated. Typically they are not).

In Summary

Developing a comprehensive program with both passive and active security features tailored specifically for each project is a key component to a successful parking operation.

Part Two

Assessing Security Program Effectiveness

Introduction

This article series on parking facility security is being presented in two parts. The first part reviewed some of the basic security concepts specific to parking facility management and parking facility design. This second part takes a detailed look at assessing security programs in general.

Building security has always been a concern for facilities management and parking professionals, but since the September 11th terrorist attacks and more recently the shootings on several university campuses, campus and facility security issues must be consistently reevaluated. In this article, we will provide you with a methodology to assess the effectiveness of the security programs at your facilities.

STAGE ONE – Conducting a Risk Analysis of Your Facility

A risk analysis consists of three major steps.

Step 1 – Conducting a Security Survey

The purpose of a security survey is to identify your organization's assets and their value and to identify threats to those assets.

Assets

The security survey should include walking through the facility and talking to the people who own it and work in it to determine the potential risks posed by the building's design and management. The physical areas to be inspected include the perimeter, offices themselves, and any areas where deliveries are received. Prior to a walk through, prepare worksheets or checklists to guide those conducting the security survey. It is also a good idea to take along copies of site plans, building plans etc. so that area of concern can be noted for easy reference.

Some of the assets that should be considered in the risk analysis include: employees, the facility itself, money, manufactured products, raw materials, intellectual property assets and industrial processes. As each asset is identified, the sources of external and internal threats to it should also be noted.

Threats

The most common external threats to a facility and the people in it include, but are not limited to, theft of equipment or data, assault, or perceived threats from loiterers.

One traditional means of evaluating external threats is to examine the community's most recent crime statistics to find out if the trends in rape, murder, theft, and burglaries are heading up or down and how long the trends have been going that way, and why. Statistics of criminal incidents for each calendar year are summarized and published by category and jurisdiction by the U.S. Department of Justice in the Uniform Crime Reports. (All U.S. jurisdictions are required to report crime statistics to this department.)

Since September 11th, many facilities are also reassessing their exposure and their preparedness for bomb threats or threats to potential building contamination by chemical or biological agents. If there is one point that cannot be overemphasized, it is the value of being prepared. Do not allow a bomb incident to catch you by surprise. By developing a bomb incident plan and considering possible bomb incidents in your physical security plan, you can reduce the potential for personal injury and property damage. The website for the US Bureau of Alcohol, Tobacco and Firearms (ATF) is a good resource for developing a bomb incident plan for your facility.

Internal threats may come from disgruntled or dishonest employees. Examples of internal threats to assets are theft, fraud, destruction

of property, arson, assaults, and crimes of passion resulting from interoffice romances. Companies should record all crimes, no matter how insignificant, that occur at the facility(ies) they own/operate.

Analysis of the incidents can reveal patterns of crime, which in turn can lead to identifying the perpetrators. Maintaining these records can also help owners avoid litigation for negligent security, as well as, support decisions to invest in new security measures.

Environment

Crime Prevention Through Environmental Design (CPTED) suggests that architects, facility planners, designers, and facilities/security professionals can create a climate of safety in a community or on a campus by designing a physical environment that positively influences human behavior. These concepts can also be used to retrofit environments to address specific security issues as they develop or to address emerging concerns as conditions change.

CPTED builds on four key strategies: territoriality, natural surveillance, activity support, and access control.

1. Territoriality

People protect territory that they feel is their own and have a certain respect for the territory of others. Fences, pavement treatments, art, signs, good maintenance, and landscaping are some physical ways to express ownership. Identifying intruders is much easier in a well-defined space.

2. Natural Surveillance

Criminals don't want to be seen. Placing physical features, activities, and people in ways that maximize the ability to see what's going on discourages crime. Barriers, such as bushes, sheds, or shadows, make it difficult to observe activity. Landscaping and lighting can be planned to promote natural surveillance from inside a home or building and from the outside by neighbors or people passing by. Maximizing the natural surveillance capability of such "gatekeepers" as parking lot attendants and front desk clerks is also important.

3. Activity Support

Encouraging legitimate activity in public spaces helps discourage crime. A public break area or outdoor lunch patio creates activity and opportunities for casual surveillance. Any activity that gets people out and working together -- a company picnic, a tenant party, a civic meeting -- helps prevent crime.

4. Access Control

Properly located entrances, exits, fencing, landscaping, and lighting can direct both foot and automobile traffic in ways that discourage crime.

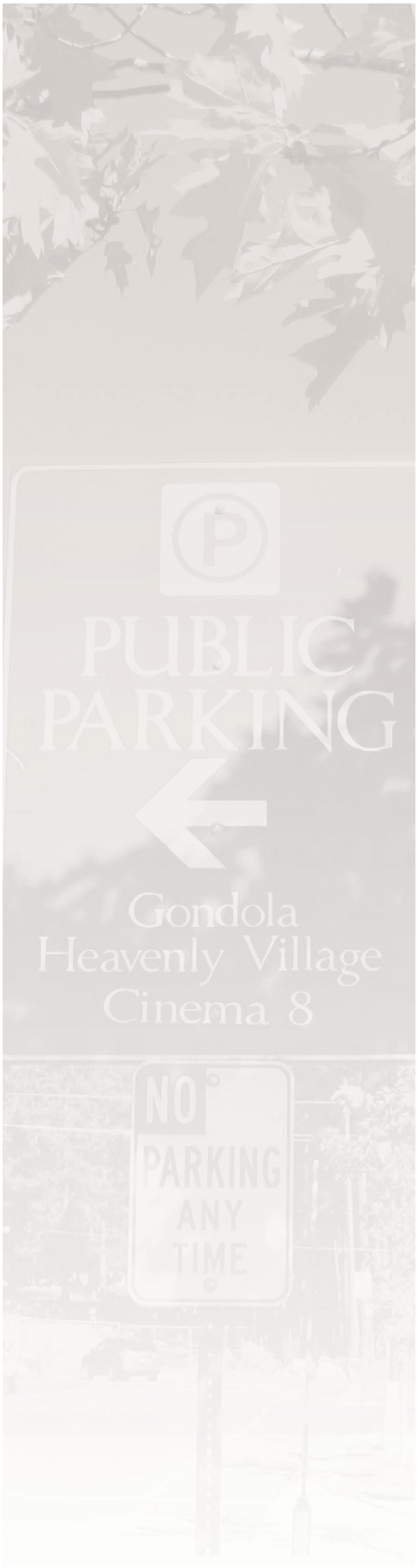
These principles are blended in the planning or remodeling of public areas that range from parks and streets to office buildings and housing developments. Some institutions have incorporated these principles into more comprehensive facility and security approaches.

CPTED works best when integrated into a comprehensive crime prevention or security program. Several approaches can discourage undesirable vehicular traffic, including instituting perimeter and/or time-related restrictions, restricting access points, channeling traffic flow, monitoring in-coming traffic, etc.

A basic security planning checklist is provided below:

Basic Security Planning Checklist

- ☑ Assess overall physical security needs with regard to facility location, layout, design, construction, etc.
- ☑ Assess effectiveness of external/ internal controls with regard to an analysis of barriers, control points, entrances/ exits, lighting, authorization levels, hardware, security devices, etc.
- ☑ Establish effective programs for personnel screening – particularly prior to employment. Establish programs for ongoing evaluation, monitoring, and assessment of personnel, especially those in high risk areas.
- ☑ Control and enforce authorization levels, key usage, access restrictions, sign-in/sign-out, opening/closing procedures, proper use of security systems, vigilance and surveillance, etc.
- ☑ Ensure full documentation of all security problems and violations.
- ☑ Develop levels of classification and restrictions (including written policies) on all sensitive material, etc.
- ☑ Establish procedures for handling/ safeguarding sensitive materials.
- ☑ Develop and enforce restrictions for employee access within the facility and around sensitive/high risk areas.
- ☑ Promote an ongoing program of monitoring and evaluation for the potential exploitation of persons with personal problems who work in sensitive and high risk areas.
- ☑ Establish effective ongoing security education training programs.
- ☑ Evaluate and plan for the possibility of electronic eavesdropping and ensure proper countermeasures.



- ☑ Use appropriate security systems, safes/vaults, and other anti-intrusion and theft devices.
- ☑ Develop a comprehensive business security planning program with ongoing evaluation and upgrade efforts.

A more comprehensive checklist is available upon request. Please send requests to dennis.burns@kimley-horn.com.

Step 2 – Estimating Probability

The second step in a risk analysis is to identify the probability that a risk will occur.

When assessing risks for security planning, employ this rule:

"The more ways a particular event can occur, the greater the probability is that it will occur."

For example, to evaluate the risk posed to office equipment, ask and answer these questions:

- » Is the equipment stored within secured rooms?
- » Is the equipment secured within the room by anchor pads or other physical locking devices, or is it protected by electronic asset protection devices?
- » How frequently do security patrols cover the area?
- » How easy would it be for a thief to dispose of an item for profit?
- » Is there a record of the serial numbers of the equipment?

Step 3 – Determining Criticality of Assets

When determining how critical an asset is to an organization, consider both the direct and indirect costs that will result from the loss of the asset. For example, many companies depend on the continuous and secure flow of electronic data inside and outside the facility. If the data flow were interrupted, the company would be unable to do business. The data, the facility where people use or manipulate it, and the connection lines the data travel over are all essential assets to the operation of many businesses. Therefore, data processing centers, telecommunication equipment, and the building infrastructure that supports them all have very high criticality.

Direct costs of the loss of an asset include permanent replacement, temporary substitution, or lost income. The indirect costs that should not be overlooked include the adverse effect on the enterprise's reputation and employee morale, loss of goodwill, and possible employee turnover.

Establishing Security Needs

To complete the risk analysis, the information gathered from the security survey, probability estimates, and criticality decisions must be integrated to determine which assets are to be protected and which are not. Prioritizing assets and determining how vulnerable

they are helps management decide the amount of resources to devote to security measures.

STAGE TWO – Selecting a Security System

We've just outlined how to conduct a risk analysis of your facility -- the first of three stages in developing an effective security program. Now, we'll continue with stage two: selecting a security system. A risk analysis should define which of your organizations assets require protection and which ones can remain at a level of risk your company is willing to tolerate. Once the risk analysis is complete and a need for an electronic security system has been established, the next step is to explore the types of systems available.

Because there are innumerable security systems with innumerable components, it's a good idea to break your research into four areas: access control, intrusion detection, surveillance, and command and control.

Access Control

Access control systems regulate who is able to enter your building through devises such as electronic card readers and electronic locks on doors. Some of the most popular capabilities of access control systems include:

- User Card Number – a basic feature that identifies the access card user by a unique alphanumeric code defined by the system manufacturer.
- Anti-Pass Back – a time-delay feature that prevents a cardholder from passing his or her access card back through or under a closed or controlled door to be used by another person who may not be authorized to enter.
- Different or Multiple Access Levels – a feature that assigns different levels of access to different building areas and allows a facility to be partitioned to prevent access to some areas while simultaneously granting access to other areas. It can also define what days and hours occupants can use the access card.
- Historical Access and Departure Reports – a feature that provides reports of entries and departures from a building, or specific areas of a building, during certain dates and times.

Intrusion Detection

Intrusion detectors use sensors to detect either the open or closed status of protected points of entry, or the presence of a person in an area and the place where the alarm terminates. Intrusion detection sensors are integrated into a system that transmits alarms to a processing location. The specific components, such as the status of latches, latch bolts or deadbolts (locked or unlocked); related power relays; switches; fittings; and keypads vary according to the type and level of protection.

Surveillance

Surveillance systems use video cameras and monitors to alert people to events that occur. Surveillance equipment is generally comprised of television cameras and monitors, video amplifiers, video switches, video tape recorders, audio tape recorders, and related cables, fittings and attachments. Closed-circuit television (CCTV) has long been associated with the security function. In the modern commercial building environment, its highest value is in providing an audit trail, which is critical in investigating a security breach or a violation of the law after such an event has occurred. (Very little crime is discovered through the CCTV surveillance system as it occurs.) Studies of individuals assigned to security consoles where CCTV cameras are monitored often indicate that console operators spend very little time watching the monitors; however, the gaming casino industry and retail environments use it to look for fraud or shoplifting. High security environments, such as the nuclear industry, military, and airports take a more vigilant approach to the use of CCTV in real-time environments. The features needed in a CCTV system depend on the purposes of security equipment as revealed by the risk analysis.

If the purpose of installing the camera is to reduce crime by immediately alerting an operator so the security force can be dispatched, the CCTV camera should be coupled with an alarm sensor device, such as a motion detector. If the purpose of the installation

is to record events, such as entries and departures, the recordings must be clear enough in terms of focus, resolution, and light levels to permit a positive identification of individuals and their activities.

If the video images and events will be used later in an investigation and criminal prosecution, the equipment must be able to produce the desired results. A management program must be devised to ensure proper archiving of the recorded events on videotape or CD-Rom for future use.

Command and Control

A central command and control station is required to manage the above-listed items and equipment. This station coordinates the control equipment and devices throughout a business's facility. This system includes a central console that coordinates the control equipment and devices required to manage the other equipment.

It also has central and remote signal processors that receive, transmit, discriminate, process, and convert signals from various security equipment into displayed and recorded intelligence or command and control functions. It has printing equipment to make permanent records of significant changes of status and graphic display equipment to project two-dimensional views of protected areas.

STAGE THREE – Managing Your Security Program

The third and final stage in setting up an effective security program is managing the program.

Electronic security systems require more management after they are turned on than they do before and during installation, including attention to systems integration, the network they are connected to, the hardware, and the people using the system. Let's start with the people.

Occupant Orientation

All of your building's occupants should be made aware of how the system will operate during an emergency requiring building evacuation, local work rules, admittance procedures, and entry control system operation. In some cases, all personnel should view a brief videotape describing the local security and emergency procedures before they are issued access or identification cards.

Managing the System

The person responsible for managing a security system has duties to perform related to three primary areas: system administration, network operations, and hardware maintenance.

System Administration

Management of the access control systems and the intrusion detection and fire alarm systems are the key responsibilities of a security system's manager.

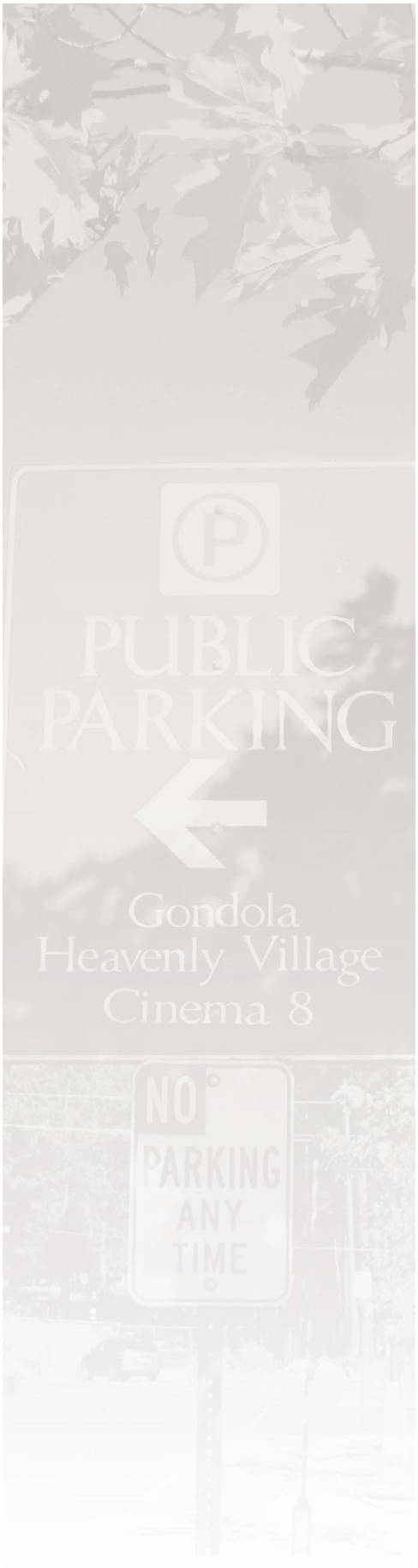
Managing the access control systems: Actual intrusions cause less than one percent of the alarms generated by electronic security systems. Many of these false alarms are triggered by faulty equipment, doors propped open, user error, someone exiting from an emergency door, an air conditioning or heating system activating a sensor, or a person trying to use a mechanical key to enter a door controlled by a card reader.

The system's manager should analyze and categorize the alarms and initiate corrective action to eliminate or minimize false alarms through prompt repair of faulty equipment, user retraining, adjustment of sensor sensitivity, or retrieval of mechanical keys from individuals who are violating access control procedures.

The access control system database usually contains two main types of information: the badge records of authorized individuals to locations where card readers are installed and the information used to automatically lock and unlock doors.

A security system manager should ensure that one person and a backup are assigned system administration duties, which include:

» Deleting system records of people who have left the payroll or tenancy, or whose entry privileges have expired. This task requires close collaboration with the human resources depart-



ment and organizations responsible for hiring contracted workers.

- Printing hard-copy access reports from the system for a given period and retaining them for a specified period of time, usually three to six months.
- Periodically polling the system to determine whether cardholders have stopped using their cards or have left the payroll or tenancy without notifying the security department.
- Programming the system to deny entry privileges to a certain person or groups of people as business needs dictate.
- Programming door schedules to accommodate user requirements.
- Providing archived reports of entries and departures of specific individuals and matching the reports to video recordings of entries and departures for investigative purposes.
- Assuring that the time stamp for the entry control system is perfectly synchronized with the time stamp for the video surveillance system so that actual facility entry and departure times are properly matched with recorded times.

Managing Intrusion Detection and Fire Alarm Systems: Intrusion detection and fire alarm system databases will usually contain the name of each protected department within the facility (referred to as an account), its location, device numbers, contact names, telephone numbers, pass codes, and response directions. In addition, the database may also contain the name and phone numbers of the head person of the protected area. The database also requires updating when a new employee is hired, or a new device is added to or removed from the system.

Network Operations

The network established to link components of the access control and intrusion detection systems may consist of several different integrated transmission systems - copper wire, point-to-point fiber optic cabling, radio or microwave signals, and either proprietary or leased telephone lines that require maintenance.

Whether the transmission system is a single dedicated system or a fragmented system, arrangements must be made for maintenance and repair. Provision should be made for annual preventive maintenance, particularly when the transmission system is complex. During this annual inspection, all equipment, such as routers, switches, and transmitting or receiving devices, should be examined to assure that the equipment is operating according to specifications. Any equipment found deficient must be properly calibrated or replaced if necessary. Arrangements also must be made to provide immediate repair in case the network fails.

Hardware Maintenance

Most security system manufacturers and installers guarantee or warrant the reliable operation of their system and components for at least one year. Before a warranty period expires, be sure to execute a service contract with knowledgeable suppliers certified by the manufacturers to service the equipment.

In Summary

Though our primary responsibilities may in the areas of parking and facility management, all of us need to sharpen our skills and knowledge of fundamental security issues. Success often lies in understanding the basic principles, developing collaborative relationships with security professionals and educating our customers on how to best protect themselves.

Acknowledgements

The following articles were researched for the development of this article and the author gratefully acknowledges these experts.\

Taking a Holistic Approach to Security
David R. Duda, P.E., CSC, CPP, PSP, and LEED AP

Protecting Corporate Secrets
Dr. Randy Gonzalez
Gonzalez is an instructor at the Sarasota Criminal Justice Academy in Sarasota, FL.

"Fear of Parking" & Pay Now ... Or Later
Dr. Randall Atlas, AIA, CPP
Vice President of Atlas Safety & Security Design, Inc.
Security Management (02/08) Vol. 52, No. 2

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Mr. Burns is the author of over 250 parking studies. His specific areas of expertise include: parking master planning, parking strategic planning, feasibility studies, supply/demand analysis, shared parking analysis, parking revenue control and operational audits, and parking system organizational development.

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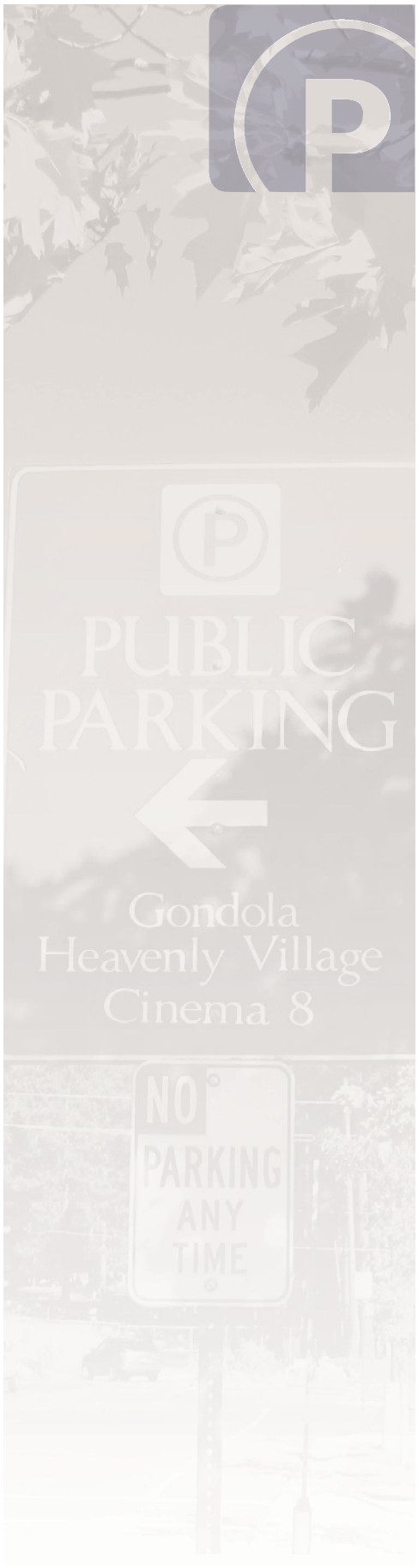


Appendix

Detailed Security Planning Checklist

1. Access Controls and Facility Surveillance Aspects
   - *A. Identification and assessment of access controls, point of entry limitations, personnel vigilance, etc.*
     - i. Types of controls and level of effectiveness in operations
       - a. In-house security personnel: patrols and inspections
       - b. Alarm systems and anti-intrusion devices
       - c. Closed circuit television and electronic monitoring
       - d. Key control management and accountability
       - e. Levels of access and authorization
       - f. I.D. badges and recognition systems
       - g. Pre-employment screening and on-the-job monitoring
       - h. Security education and emphasis on enforcement
       - i. Other types of access controls
     - ii. Perimeter and barrier protection
       - a. Natural barriers: landscape and terrain
       - b. Fencing: type and construction
       - c. Walls and ceiling construction: high risk areas
       - d. Gate facilities: security checkpoints
       - e. Frequency of patrols and security checks
       - f. Door and window locations and security devices used
       - g. Reception areas: location and control of entry
       - h. Employee surveillance and vigilance
       - i. Parking areas: entrance/exit, access to facility

2. Identification of importance of product, process, information, etc.
   - *A. Importance of specific product, process, or service, and current security efforts applied to protect same*
   - *B. Levels of classification and authorization for access to specific product or service*
   - *C. Determination of how critical a security breach would be to company operations*

D. Identification of critical office and work areas involving the use of the product, process, information, or service

i. How vulnerable are these areas at the present time?

ii. How frequent is an evaluation made of critical areas?

iii. How effective is pre-employment screening for persons in high risk or critical areas?

iv. What are the levels of authorization?

v. What levels of accountability are in force?

vi. Have security classifications been assigned?

vii. Has an assessment been made of the value, critical nature, and related impact on the company if a loss occurs?

viii. What special advantages might be lost?

ix. Have effective countermeasures been implemented?

3. External planning and assessment factors: security environments

A. Assessment of the business or facility in relation to the surrounding neighborhood, business district, industrial park, and other related setting

i. Is good surveillance of the property possible?

ii. Are effective access controls in place?

iii. Is the structure located in a high crime area?

iv. What has been the history of crime and/or security breaches?

v. Is the facility isolated and located in a remote area?

vi. If so, what has been done to protect/safeguard approaches to the facility? (Identification of visitors, vendors, etc.)

vii. Are all possible access points monitored and protected?

viii. What would be the probable response time by police or in-house security staff if a security breach occurs?

B. Assessment of factors pertaining to freedom of access and factors related to layout and design considerations

i. Are external areas designed and developed in conjunction with security needs?

ii. Who is allowed access to the facility and during what times of the day? Levels of authorization?

iii. Have high risk areas, such as those containing trade secrets, confidential information, computer files, sensitive records, and documents been given special atten-

tion for security and protective needs?

iv. What factors are specific to this particular operation?

v. Are there any aspects of the facility in need of upgrade with regard to security?

vi. How effective are the current security aspects of the following areas?

a. Barrier controls, fencing, building design, etc.

b. Lighting conditions for security illumination

c. Obstructions to security patrols and surveillance visibility

d. Exterior doors, access points, entrances, etc.

e. Exterior windows and other openings

f. Possible points of concealment and climbing aids

g. Trash collection areas and disposal of documents, papers, etc.

h. Alarm systems and related security devices

i. Personnel, visitors, and others: control of movement, etc.

C. Assessment of the potential of unauthorized entry to high risk or sensitive areas

i. Do neighboring facilities, structures, buildings, etc. present or create any observable security hazards? Could access control be compromised by an intruder gaining access from another building or facility?

ii. Could locking mechanisms be compromised?

iii. Do other openings create security problems?

iv. Is there an effective program of lock maintenance and key control management?

v. Has everyone been identified who has keys or other forms of access to high risk areas? Is the list up-to-date? Are there restrictions combined with levels of authorization?

vi. If a locking system or other protective device is compromised, what procedures and/or actions are taken?

vii. Are intrusion detection devices adequate? Could they be compromised? What changes would improve security?

viii. How effective is wall, ceiling, hallway, or office construction in preventing compromise of high risk areas?

ix. Is there an effective level of employee vigilance?

4. Procedural security and policy formulation

A. *Identification of essential needs for a written security policy with well-defined procedures*

i. Is there written company policy regarding security practices and procedures? Are there specific statements pertaining to the protection of company secrets, information, documents, etc.?

ii. Does policy incorporate specifics with regard to enforcement and penalties?

iii. Will the company prosecute?

iv. Is policy translated into actual practice?

v. Does the policy make an effort to cover all possible situations?

vi. Do employees understand the policy? Is it made available?

B. *Procedures and rules specify operational areas*

i. Are specific guidelines provided to all personnel with particular emphasis on operational areas?

ii. Do guidelines cover the locations and operations of the high risk and sensitive locations, such as: visitor control points; files and cabinets; labs and research; safes and vaults; library storage; copy centers; document storage areas; computer sites/centers; production/process areas; critical office areas; blueprint rooms; office equipment/machines; other special areas.

iii. Are there checks and balances to ensure proper security regarding check-out, check-in, borrowing, loan, etc.?

C. *Procedures, rules, and policies are clear-cut and understood with regard to all levels of operation in high risk locations within the company:*

i. Employee orientation programs and training

ii. Signed statements by employees attesting to policies, procedures, etc. (e.g., nondisclosure agreements)

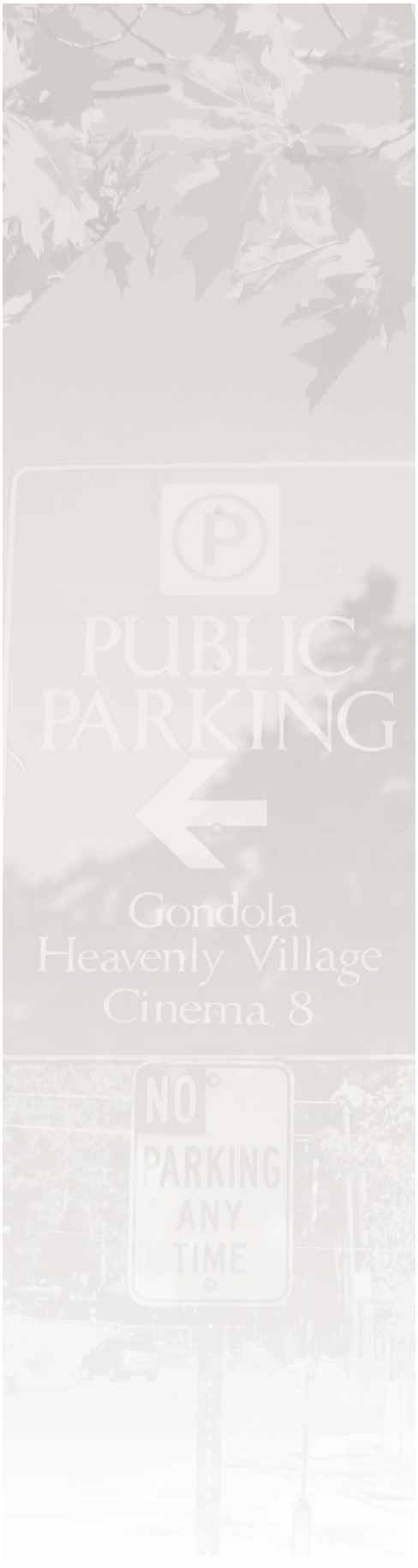
iii. Assignment of certain personnel (security staff) for monitoring, enforcement, etc.

iv. Selective monitoring and evaluation (undercover officers, investigators, etc.)

v. Enforcement applied to everyone in a fair manner without regard to position or level in company

vi. Security practices emphasized on regular basis

vii. Opening and closing procedures



viii. Log-in and log-out procedures followed closely

ix. I.D. badges worn at all times where required

x. Centralization of access points, entrances, exits, etc.

xi. Disposal areas and trash collection points monitored

xii. Appropriate use of security systems and devices

xiii. Unannounced inspections and checks

xiv. Inventories and audits on regular basis

D. Procedure security planning

i. Is management satisfied that appropriate steps have been made to ensure reasonable security procedures to safeguard sensitive and critical information, processes, materials, etc.?

ii. Is every effort made to ensure that personnel understand that a certain product, process, or information is classified as secret or confidential, or some other sensitive classification?

iii. Has every effort been made to enforce and restrict the access to sensitive areas and materials? Have procedures been followed in a consistent manner?

iv. Have guidelines been published within the company listing those materials, processes, information, papers, etc., that are classified as sensitive and restricted? Are these provided for each specific group or project area?

v. Have levels of sensitive classification been established? (For example, "secret," "classified," "confidential," "restricted," etc.)

vi. Are restrictive signs posted in sensitive areas?

vii. How effective are current procedures with regard to:

a. Access controls

b. Opening and closing

c. Control of documents

d. Supervision/monitoring

e. Property control

f. Check-in and check-out

g. Control of contractors, vendors, repairmen, custodial services

h. Disposal/removal of records, papers, etc.

i. Key control and key usage

j. Locking and unlocking

k. Shipping/receiving controls

l. Storage of materials, etc.

m. Employee vigilance/surveillance

n. Security systems/devices

o. Other procedures and controls

5. Sensitive document security planning Considerations

A. Assignment of levels of responsibility for the security and protection of sensitive documents and papers

i. Establishing internal controls, degree of security needed, and levels of responsibility

a. Who has primary responsibility to ensure the safeguarding of the sensitive documents and papers?

b. Do security personnel play a key role in such efforts?

c. What levels of clearance have been established?

d. How is responsibility delegated and how are persons held accountable for security requirements?

e. What is the current degree of security and what can be done to improve current conditions?

f. Is there a document control officer and what are his or her responsibilities?

g. Is there an on-going security education program?

ii. Establishing internal controls and procedures

a. Has an identifications means been established to classify documents according to degree of sensitivity?

b. Are all documents covered by proper controls and audits, receipt verification, logging, etc. at all times?

c. Is a well-defined chain of custody maintained at all times?

d. Do control officer(s) ensure that documents are hand delivered to authorized persons with proper checks and balances?

e. Do all persons handling documents have proper clearances and were they properly screened through an effective pre-employment background investigation?

f. Do all storage facilities provide effective physical security?

g. Are all combinations, codes, or other access means to storage facilities protected at all times, and are these combinations changed periodically?

h. Are all files, safes, cabinets, etc. kept locked and secured at all times when authorized persons aren't present?

i. Are daily inspections conducted by control officer(s) to ensure that all materials are safe-guarded and located in their proper locations?

B. Basic physical security planning

i. What measures have been taken to protect the areas containing sensitive documents and papers?

a. Personnel controls

b. Document controls

c. Lighting security

d. Door/window protection

e. Identification controls

f. External barriers

g. Alarm systems

h. Inspections/monitoring

6. Safes, vaults, and safe rooms

A. General considerations for safes and vaults

i. Review and analyze current usage, design, security aspects, related criteria concerning all safes and vaults

a. What types are used and how effective are they?

b. Where are they located and how well can they be protected?

c. Are they properly secured to a fixed position (if a small or portable safe)?

d. Are they being used appropriate to design and specifications as prescribed by manufacturer? UL ratings, etc.?

e. Who has the combination, how often is it changed, and how is the combination safeguarded?

f. How effective will the safes or vaults be against a burglary attack? What physical security needs are there?

g. Are any security alarm systems used to protect the safe or vault, including areas in which they are located?

ii. Procedures for safeguarding safe and vault areas

a. What access controls are used?

b. How frequently are these areas patrolled or inspected?

c. Are there levels of authorization required for access to the area or office location?

d. What other procedural safeguards are taken?

B. General considerations for a "safe" room (Note: A "safe" room could be used to safeguard small safe units, computer files, records, documents, and other sensitive material storage in lieu of a large vault if such would not be practical. Security alarms, maximum security hardware for doors, etc. would be critical to the design. The entire room would have to be protected on all sides, including roof and floor areas, with no other access points other than doors, in order to be effective.)

i. Has consideration been given to a special location within the facility for construction of a well protected, alarmed, and restricted "safe" room?

ii. If so, could small safes, sensitive files, documents, and related materials be placed within this room?

iii. Could a "safe" room be designed that would resist intrusion for several hours?

7. Personnel controls and security planning

A. Develop and identify critical needs with regard to screening, training, education, and access levels for all personnel

i. Screening and background investigations

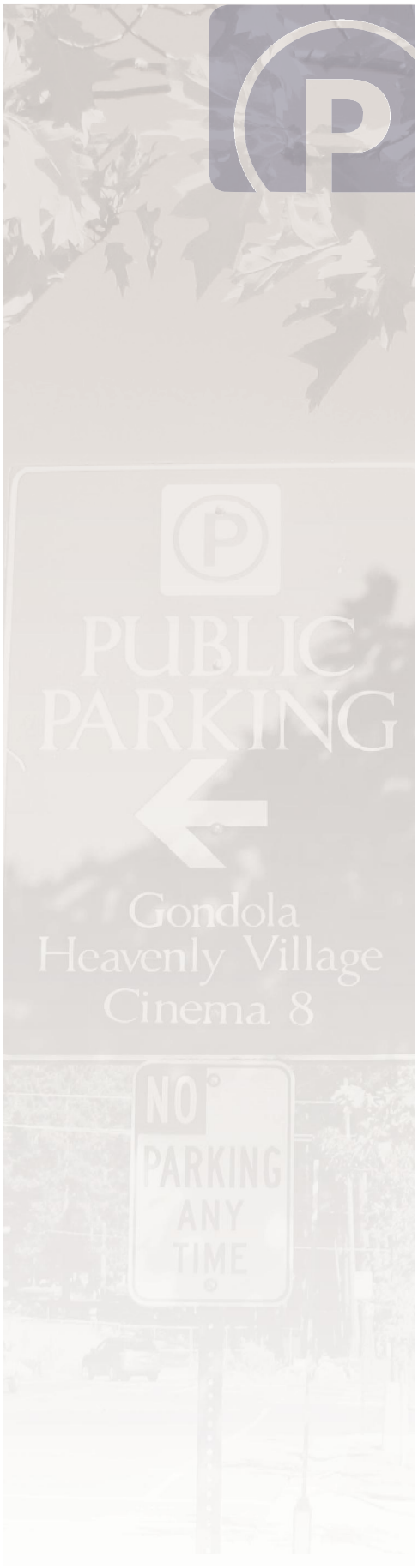
a. Is someone assigned to conduct a thorough pre-employment screening for all personnel? Is this done at all levels where there is the possibility that contact will be made with sensitive/high risk information, materials, products, etc.?

b. Are all references thoroughly checked?

c. Are investigative tools such as a polygraph, special tests, or a combination of devices used in pre-employment screening?

ii. Supervision, monitoring, and evaluation

a. Do supervisors provide an effective level of supervision at all levels? Do they set good examples for subordinates? Is there a good level of surveillance and vigilance in critical areas?



b. Are periodic checks and inspections made by supervisors?

c. Are personnel effectively evaluated in the handling of sensitive materials?

d. Are all rules, policies, and procedures enforced?

e. When a security violation occurs, is it documented?

B. Assess training, education, and other security needs

i. Is there an effective security education program?

ii. Are there any possible warning signs of potential problems with personnel in critical areas such as: personnel making threats, upset, dissatisfied, etc.; personnel with financial problems; personnel arriving earlier and/or staying later than normal; personnel with extravagant personal lifestyle or habits; personnel who avoid taking vacations, working weekends, etc.; other possible indications or problem areas.

iii. What special security needs might be added to upgrade and enhance security of the area:

a. Additional barriers and access controls

b. Identification systems/I.D. badges

c. Restrictions on access and related control measures

d. Effective system of internal audits and inspections

e. Entry/exit screening packages, containers, etc.

f. Key control system/key control management

g. Strict enforcement of all security policies

h. Checks and balances/log-in and log-out controls

i. Change all locks and combinations when an employee leaves, transfers, terminates, etc. Change locks/combinations if a security breach occurs or is suspected

j. Upgrade security systems

The Security Checklist was created by Dr. Randy Gonzalez, an instructor at the Sarasota Criminal Justice Academy in Sarasota, FL.

Prepared for

PARKING STRUCTURE

Design Guidelines

Kimley»Horn

Expect More. Experience Better.

Table of Contents

Introduction

This document was developed for Cleveland County and the City of Norman as a guide for future parking structure design. It contains information to help developers and designers incorporate parking structure components into proposed projects. The concepts presented will help produce functional, well-designed and patron friendly parking structures that will become valued infrastructure elements for the Downtown. The concepts are presented so that common design mistakes can be avoided by being addressed early in the design process. The document is based on internal *Guidelines for Functional Parking Design* and should be periodically updated to reflect state-of-the-art parking design practices and principles. It includes the following categories:

- Project Delivery
- Sustainable Design - LEED
- Site Requirements
- Site Constraints
- Concept Design
- Circulation and Ramping
- Access Design
- Parking Geometrics
- Parking Layout Efficiency
- Pedestrian Requirements
- Accessible Parking Requirements
- Safety and Security
- Lighting
- Signage and Wayfinding
- Drainage
- Open or Enclosed Parking Structure
- Structural Systems
- Durability Design
- Other Considerations

In any future parking development project, it is highly recommended that qualified parking structure design specialty firm be engaged in the project due to the unique characteristics and design expertise required to develop a successful project.

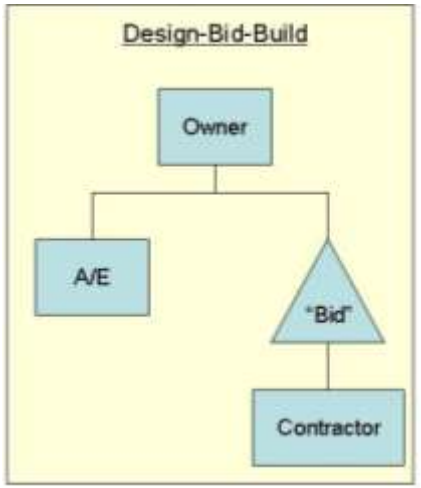
Project Delivery

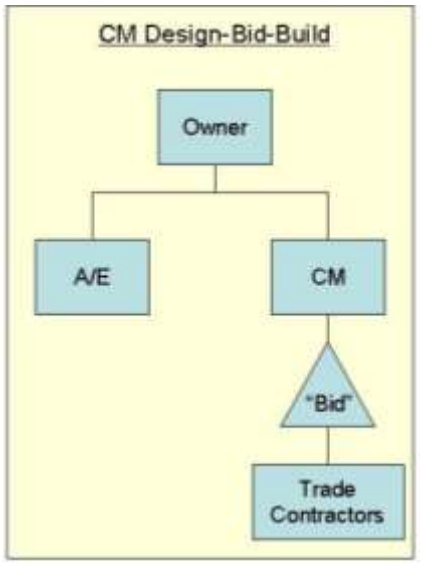
There are four primary project delivery methods commonly used to design and construct parking structures. Two Design Professional's Handbooks titled the *Design-Build Project Delivery* and the *Design/Contract-Build Project Delivery,* published by the American Council of Engineering Companies (ACEC), are helpful references.

Each method is described on the following pages, along with a graphical depiction of the contractual relationships for each:

1. *Design-Bid-Build* (D-B-B) projects are those where the owner selects and contracts with the lead designer (Parking Consultant or Architect/Engineer). They in turn represent the owner in defining the project and preparing drawings and specifications to meet the owner's needs for competitive bidding to contractors. Often on public projects the owner is required to select the lowest "responsive and responsible" bid, with the contractors' qualifications often not given consideration. The D-B-B method is sometimes referred to as the "traditional" process and is still the most common method.

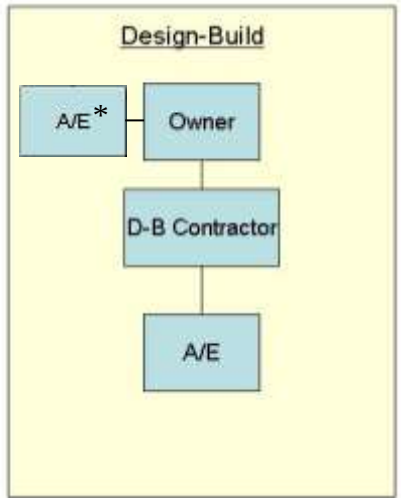
2. *Construction Manager - Design-Bid-Build* (CM D-B-B) is where the owner selects and contracts with the A/E who represents the owner in defining the project and preparing drawings and specifications to meet the owner's needs for bidding. However, the owner also retains a construction manager (CM) who works with the A/E during the design phases, sets the project schedule, and performs construction cost estimates. The CM bids the work to subcontractors for the various trades. This is a better method than D-B-B for projects where the owner wants fast track or phased construction.



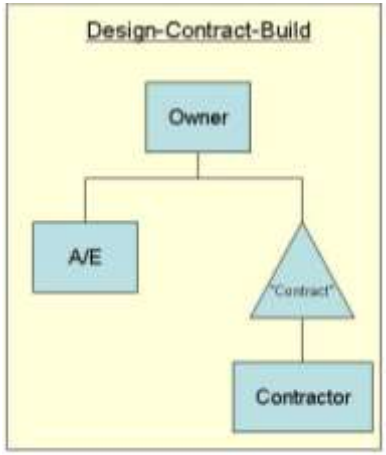


3. *Design-Build* (D-B) are cases where the owner retains a D-B contractor who in turn retains the A/E so there is a single entity responsible for both design and construction. Often the owner prepares or retains another A/E to prepare design build criteria documents as described below. Often, the owner can select the D-B team based on qualifications and cost, consistent with the bidding documents. There has been more interest in D-B type projects recently because of owners who perceive benefits regarding cost, schedule, and risk management.

4. *Design-Contract-Build* (D-C-B) are projects where the owner selects and contracts with the A/E. The A/E prepares preliminary documents that are the basis for the owner contracting with the contractor early in the design process, rather than waiting for final design documents to be prepared as for D-B-B. This method combines the advantages of the D-B-B and D-B methods while reducing many disadvantages to allow the owner to have the most qualified A/E and contractor involved in their project from the design phase through the completion of construction.



*: Optional but recommended; A/E prepares design build criteria documents that are basis for contract with contractor.



In recent years, there has been an increasing interest and use of Design-Build in the construction of parking structures. Legislation has been enacted in many states to allow D-B to be used by public entities because prior laws required publicly funded construction contracts to be awarded based upon completed design documents.

Advantages of Design Build:

- Owner has a single point of responsibility for design and construction.
- Potential for better design and construction coordination because the A/E is working for the contractor.
- Owner does not have to arbitrate disputes between the A/E and contractor.
- Owner reduces their risk because the D/B contractor is responsible for errors or omissions in the design documents.
- Could be less administrative burden on the owner.
- Potential for accelerated schedule because the contractor is onboard at the beginning and because of the overlapping of design and construction work.
- Potential for lower costs due to the contractor being in greater control of the project and due to the accelerated schedule.
- Costs are well defined earlier in the process

Disadvantages of Design Build:

- The D-B contractor has the incentive to complete projects faster and less expensively which can mean reduced quality of materials and workmanship.
- The owner has less involvement and control of the design because the A/E represents the D-B contractor's best interests, not the owner's. Not only is this a disadvantage for the owner, but it creates a difficult conflict of interest for the A/E.
- The owner does not benefit from independent advice and input from the A/E and contractor.
- Greater definition of the project is required up front to define goals, objectives, and minimum requirements for project function, appearance, quality, materials, operation, etc. prior to bidding to D-B teams.
- More risk for D-B teams, which can negate the potential cost saving opportunities.

When owners decide that D-B is right for their project, they can have a better chance of achieving a successful project utilizing the following procedures.

Recommendations Regarding the Design-Build Delivery Method:

1. The owner should retain an A/E at project initiation to prepare the D-B criteria documents. This allows the owner to have more input into the concept design and set standards and criteria for the project. Also, due to the uniqueness of parking structures, it is important to have the A/E led by a parking consultant or for a parking consultant to have a significant role on the design team.
2. D-B criteria documents should clearly define the project scope, function, appearance, quality, materials, and operations. The level of completeness of these documents varies, but generally they are in the 10 to 30 percent range (between Schematic Design and Design Development level of completeness).

3. The owner should use a very transparent selection process to hire the D-B contractor, using the D-B criteria documents as the basis of the Request for Qualifications/Proposals (RFQ/RFP).

4. The selection process should consider the D-B teams' technical qualifications and experience in addition to cost. Typically, there is a weighting of selection criteria such as the experience and expertise of the firms and key personnel making up the team, experience of the team working together, technical merits of design, project appearance, quality and safety programs of the contractor, references, schedule, and cost. The selection criteria and weighting should be defined in the RFQ/RFP.
5. The owner's A/E who prepared the D-B criteria documents should continue on during the final design and construction to represent the owner's interest and help assure that the design and construction are completed in conformance with the D-B criteria documents.

Parking structure built for Baylor University using the Design-Build delivery method

As an alternative to using the D-B method, the D-C-B or CM methods can often result in a project that meets the owner's best interests because:

- The A/E contracts to the owner, thus representing their interests, not the contractors, which should enhance quality
- Design decisions can more easily be made that are in the best long-term interest of the owner, considering factors that will provide the lowest life cycle maintenance or operational cost, rather than emphasizing those that just provide the lowest first cost or schedule advantage
- The CM or contractor is onboard early in the design process so the A/E and contractor collaborate during design, enhancing innovation and opportunities to consider the contractor's cost saving ideas
- Similar schedule and cost advantages compared to D-B.
- Less risk for all parties as responsibilities can be allocated where they most belong

Successful parking structure projects have been completed using all four of the construction methods discussed above. Understanding the advantages and disadvantages of each and following a process to address them will help assure that the completed project is a success for the user, owner, community, designer and builder.

Sustainable Design and Accreditation

While it is possible for parking structures to achieve certification, typically only occupied buildings receive certification for their sustainable design through the U.S. Green Building Councils (USGBC) Leadership in Energy and Environmental Design (LEED) accreditation program. However, parking structures that are part of a mixed-use project can help attain LEED points for the entire building project. The fact that stand-alone parking structures are generally not eligible for LEED certification should not discourage including sustainable design elements in parking structures.

Note: The Green Parking Council was recently acquired by the Green Building Certification, Inc. (GBCI), the certification body for US Green Building Council's (USGBC) global LEED green building rating system, which will now administer the Green Garage Certification Program.

Examples of sustainable design features for parking structures include:

- Sustainable Site Development
  - Green roofs
  - Solar panel sunshades on the top levels
  - Alternative transportation accommodations
- Water Savings
  - Water-efficient landscaping
  - Irrigation using non-potable water
  - Innovative technologies for water retention/detention
- Energy Efficiency
  - Energy efficient light sources such as natural lighting, fluorescent, induction, and light emitting diodes (LED)
  - Photovoltaic solar panels
  - Computerized lighting controls and voltage reduction

Materials and Resources Selection

- Reuse of existing facades or shell
- Use of recycled materials such as silica fume, fly ash, and steel
- Carbon fiber reinforcement
- Thin brick façade panels
- Recycled rubber

- Indoor Environmental Quality
  - Low VOC products (e.g., paint, sealers and coatings)
  - CO monitoring and venting
  - Maximum natural ventilation and lighting (e.g., interior light wells)
  - Sustainable cleaning products
- Innovation and Design Process
  - Multi-modal facilities
  - Automated parking facilities on smaller site footprints
  - Designs for 75 -100 year life
  - Bicycle storage lockers

Sustainable Parking Operations and Management

This chapter identifies the many areas that can be addressed when a program wishes to enhance the sustainability of their parking operations program. Ideas are presented for the parking operator or owner to consider, whether the parking system includes one or multiple facilities, and whether it is an established system or a new one.

In the introduction to the Green Parking Garage Certification manual it is noted that "as an asset class and building type, historically parking has lagged in the sustainability movement. Yet, parking and mixed-use structures constitute a substantial portion of the built environment. Additionally, parking and transportation have significant environmental impacts, especially regarding carbon emissions, pollution, and fuel consumption."

Parking sits at the critical intersection of the built environment and transportation modes. As such, parking structures create new opportunities to advance sustainability – both in how we plan, design, and maintain parking structures (the built environment) and our commuting and travel options (transportation modes).

Note: A more comprehensive discussion of these concepts as well as a structured approach to developing a parking operations and management program that is designed to meet specific sustainability goals can be found in the book "The Sustainability of Parking" jointly published by the International Parking Institute and the National Parking Association. (See CHAPTER 5, Sustainable Parking Operations and Management.)

It should be noted that, while this chapter references programs geared toward reducing greenhouse gasses and other climate change related issues, we are not saying that carbon emission reductions is necessarily the ultimate goal, but that it is one example of "measurable outcomes" if your program has adopted a climate change based philosophy. Many other ways to quantify sustainable parking and transportation program impacts exist and more are being developed as these programs evolve.

Sustainable Parking Operation and Management Checklist

The following check list of sustainable parking and transportation demand management strategies was developed after reviewing several current texts on this topic as well as reviewing programs such as LEEDs, Green Globes and the Green Parking Council. This checklist provides a wide range of options in a number of categories designed to promote:

- Increased energy efficiency and performance
- Reduced environmental impact
- Efficient parking space management
- Integrated sustainable mobility services and technologies
- Enhanced performance as mobility hub
- Stronger community relationships

The Green Parking Council uses a standard that is organized into four major categories: Management. Programming Technology/Structure Design and Innovations.

- Management highlights ways in which garage operations can maximize the use of a parking asset while minimizing waste. Embracing these practices ensures facility staff utilizes resources to their full potential.
- Programming guides garages to new revenue sources, greater customer satisfaction and stronger community relations. Green garage programs ensure effective vehicle ingress/egress, provide access to alternative mobility solutions, and leverage the garage's potential as a public space.
- Technology and Structure Design outlines the physical attributes a garage can deploy to increase energy efficiency, lower waste and support customer mobility choice.
- Innovations focuses on emerging sustainability initiatives and concepts that while not yet in the mainstream usage provide creative ideas and inspiration for potential future adoption.

The Sustainable Parking Operation and Management Checklist is organized into the following categories:

1. Planning
2. Parking Management
3. Facility Design/Layout
4. Demand Reduction / Transportation Demand Management (TDM)
5. Alternative Transportation Support Programs
6. Wayfinding and Parking Guidance
7. Use of Recyclables
8. Energy Savings/Generation Strategies
9. Water Management
10. Facility Maintenance and Cleaning
11. Electric Vehicle Charging
12. Green Garages

1. Planning

- **Integrated Parking and Transportation Planning**
  - Develop a parking strategic plan in conjunction with a larger community-wide transportation plan
- **Parking Requirements or Guidelines**
  - Ensure parking requirements or guidelines (where exempt) are appropriate and "right-sized" for the environment
- **Flexible Zoning Code Standards**
  - Adopt flexible zoning code standards that take multiple factors into account
- **Environment Specific Parking Ratios**
  - Develop a parking space-to-gross square foot (GSF) ratio goal that reflects "essential need"
  - Use the target ratio in parking planning appropriate for the environment
- **Shared Parking**
  - Promote shared parking whenever possible

- Utilize the ULI "Shared Parking Model" to promote the "rightsizing" of parking development, (taking advantage of complementary peak parking accumulation patterns by certain combinations of land-uses when the parking resources can be effectively shared.
- Encourage and design parking facilities to support shared parking

- **Parking Location Planning**
  - Consider providing public parking in locations that strategically supports an area or district
  - Plan for some additional public supply when a new development is created to anticipate adaptive reuse and in-fill projects in the area
  - Strategically consider the proximity of parking facilities to transit resources to promote a "Park Once" environment.
- **Life Cycle Cost Assessment**
  - Conducting a life cycle cost assessment especially of durability design elements, may increase initial facility development costs, but can provide significant savings in terms of long-term life cycle costs for a parking facility.

2. Parking Management

- **Charge for Parking**
  - Charging market rates for parking makes the public aware of the fact that parking is never free and promotes consideration of alternative
  - Implement "Demand-Based Parking Pricing" strategies
  - Coordinate on and off-street parking rates
    - Set pricing for on-street parking to promote short-term, high turnover parking
    - Set off-street pricing to encourage longer-term parking
- **Develop a parking allocation program based on "essential need".**
  - The way we allocate our resources gets to heart of a parking program's philosophy and core principles. If sustainability is considered a core value, then decisions related to parking resource allocation should reflect sustainability principles. For example, at the Seattle Children's Hospital, all parking is provided only on a daily fee basis (monthly parking charges were eliminated. With no sunk costs

related to monthly parking passes, other commute options are encouraged.
- Develop parking policies designed to meet the needs of multiple parking patron types (i.e. commercial, retail, residential, etc.)

- **Reserved Parking Areas**
  - In general the use of "reserved parking" is discouraged in that it promotes inefficiency in utilizing available resources and limits the ability to share and over-sell spaces
  - Implement or expand reserved areas for car/vanpools
  - Implement or expand reserved areas for hybrid/low emission vehicles
- **Discounted Parking Rates and special offers**
  - Offer "Clean Air Car Discounts" or "Green Parking Permits" (i.e., reduced parking rates) for car/vanpools
  - Offer "Clean Air Car Discounts" or "Green Parking Permits" (i.e., reduced parking rates) for hybrid/low emission vehicles
- **Technology**
  - Help drivers exit the garage with little or no idle time with traffic control (i.e. pay-on-foot kiosks, automatic vehicle identification (AVI) technology, etc.)
  - Evaluate space availability systems to reduce the search time for spaces within parking facilities
- **Special Programs / Events**
  - Participate in annual events such as "Parking Day" to promote awareness of program alternatives
  - Offer tire inflation stations to encourage proper tire pressure which can contribute to increased fuel economy
  - Work with local TMAs or Transit Agencies to develop and promote "Transportation Fairs" or other community-based programs to educate and encourage the use of transportation alternatives

3. Facility Design/Layout

- **Facility Design**
  - Consider "Green Roofs" (vegetation), "Blue Roofs" (retains water), or "Cool Roofs" (roof coated with a light colored, solar reflective materials)
- **Facility Lighting**
  - Light with energy-efficient fixtures / Reevaluate lighting types (consider replacement with LED or fluorescent lights to reduce power usage)
  - Develop a fluorescent lamp recycling program
  - Stain or paint interior parking garage surfaces to maximize reflectivity and enhance facility lighting without increasing energy costs
  - Consider the use of sensors/timers to reduce light levels in certain zones when not in use, or during daylight hours
  - Evaluate individually powered solar parking lot lights
- **Parking Layout**
  - Assess current parking space layouts, and consider options to maximize use of existing spaces

4. Demand Reduction / Transportation Demand Management (TDM)

- **Evaluate changes to parking pricing that could reduce parking demand**
  - Belong to an organized Transportation Management Association
  - Provide easy access to alternatives
  - Consider restricting parking availability
  - Offer discounted transit passes and sell them along with parking permits
  - Develop a "commute options" program to make patrons more aware of the alternatives to driving alone
  - Offer a "parking Cash-Out" option
    - Commute bonus for alternative commute—up to $65/month (pre-tax deduction)

- Develop an on-line commute management system that allows employees to claim commute bonus, track parking charges and plan alternative commute trips and find carpool/vanpool partners.
- Offer an option to the traditional "monthly parking contract" – Consider offering a "Parking Scratch-off Card"
  - "Unbundle" monthly parking by offering a punch card option instead of a traditional access card
  - Drivers only pay for days they drive
  - Creates an incentive to consider alternatives to driving

Support Active Transportation Program Development

- Promote zero-impact modes of travel
- Add or expand secured parking facilities for bikes
- Company bike or a free bike for an employee who commits to bike to work at least 2 days/week
- Implement a program of providing temporary bike racks to handle seasonal demand peaks for bike parking. The temporary bike rack pictured to the right takes up only one on-street parking spaces
- Implement or participate in promoting a bike-share program
- Offer parking for bicycles
- Offer bike sharing (or have one nearby)

Marketing and Communications

- Improve marketing of transportation alternatives
- Improve TDM marketing outreach to include direct participation in all new student and employee orientations
- Solicit and convey vanpool and bus club customer testimonials about their positive experiences as members
- Solicit/Expand transportation department's participation in the larger community "Sustainability Committees" or "Transportation Master Planning processes"
- Promote an increase in funding for pretax transit and downtown shuttle programs
- Generate/Expand car-sharing program participation through user-based promotional efforts

- **Fleet Management**
  - Reduce campus fleet vehicles' reliance on fossil fuels
  - Increase percentage of "alternative fuel" vehicles in fleet
  - Expand car-share fleet to meet daily vehicle trip demand of departments, employees, and students
  - Integrate campus or corporate fleet management with carsharing programs providing faculty, staff, and students with instant access to a fleet of vehicles within walking distance from campus or downtown offices
  - Offer reserved or discounted parking for vanpool or carpool customers
  - Provide reserved or discounted parking for fuel efficient vehicles
  - Provide reserved or discounted parking for alternative fuel vehicles

5. Alternative Transportation Support Programs

- **Provide or support a range of transport alternatives**
  - Increase the amount and types of bike parking
  - Become a funding partner for campus or community bike rental programs
  - Invest in changing rooms/showers
  - Partner with bike concierge services
  - Provide reduced priced parking in remote “ride sharing” collector lots, supported by transit of shuttle programs

6. Wayfinding and Parking Guidance

- **Improve parking signage and information**
  - Help drivers find your parking facility more easily with enhanced signage and wayfinding outside of your garage
  - Consider incorporating parking availability data into external and internal parking signage
  - Help patrons locate available spaces more quickly and efficiently with internal wayfinding
  - Evaluate or implement parking guidance systems to improve parking efficiency

- Develop a parking availability/location mobile device application to reduce the circling of vehicles

7. Use of Recyclables

Recyclable Resources

- Replace all light bulbs in office environments with compact fluorescent bulbs
- Replace concrete parking and traffic products with those made from 100% recycled rubber (e.g., wheel stops, speed humps, sign bases, etc.)
- Implement a parking garage lighting recycling program (especially if fluorescent lighting fixtures are in use.)
- Offer recycle bins for patrons & employees
- Purchase recycled, organic or local products
- Recycle disposed materials, use local labor, or source local or recycled materials when undergoing new construction or renovations

8. Energy Saving/Generation Strategies

Energy Related Strategies

- Have climate controlled occupied areas (programmable thermostats/sensor controls)
- Have an open air design with no ventilation system in the parking areas
- Ventilate the decks with variable controlled air flow (i.e. VFD) or sensor activated (i.e. DCV) technology
- Generate renewable energy (i.e. solar PV, wind turbines, hydroelectric)
- Cover parking lots and garage roofs with solar panels.
- Generate renewable energy strategies (i.e. solar PV, wind turbines, etc.)

9. Water Management

- Water Saving
  - Replace plumbing fixtures with water-saving fixtures
  - Use water-efficient landscaping (e.g., xeriscaping/native plants to reduce irrigation needs)
  - Develop a storm water management plan
  - Capture "grey water" for use in watering parking landscaped areas

10. Facility Maintenance and Cleaning

- Maintenance, Recycling and Environment Enhancements
  - Implement on-site wastewater treatment
  - Use sustainable cleaning supplies/Clean with green, non-toxic cleaning products
  - Apply low- or no- VOC (Volatile Organic Compound) coatings to all surfaces
  - Make interior spaces tobacco free
  - Add recycling containers for all facilities where they are convenient to patrons and staff

11. Electric Vehicle Charging

- Promote the use of non or reduced emission vehicles
  - Provide charging stations for electric vehicles
  - Develop electric vehicle charging system specifications

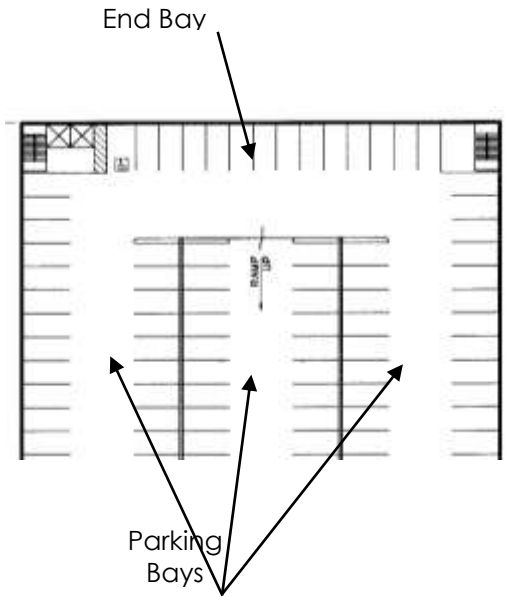
12. Green Garages

- Consider third party sustainability certifications, such as LEED or Green Globes
- Adopt a standard that all parking construction will seek a LEED ®-based equivalency rating of "Silver" or better when feasible and/or Green Parking Council standards.
- Adopt a standard for new garage development that solar arrays that generate up to 50% of the facility's power needs must be integrated

Site Requirements

Large and rectangular shaped sites are ideal for parking structures. Although flat sites are generally more economical to develop, sloped sites can provide design opportunities such as access on different levels and/or no ramping between levels. For a reasonably efficient parking layout, double-loaded parking "bays" range in width from about 54 to 60 feet, depending upon the angle of parking and the width of the parking space. The overall width of the structure should be determined based upon multiples of the chosen parking bay width. An ideal length for a parking structure is at least 240 feet. Longer sites provide the opportunity to park along the end bays, which provides more parking spaces, improves efficiency, and lowers the cost per space. A longer site also allows for shallower ramps which provide improved user comfort.

Generally, parking bays should be oriented parallel to the longer dimension of the site and preferably in the predominate direction of pedestrian travel. Walking distance tolerances from parking to a primary destination are typically 200 to 300 feet for shoppers, 500 to 800 feet for downtown employees, and 1,500 to 2,000 feet for special event patrons and students.



Site Constraints

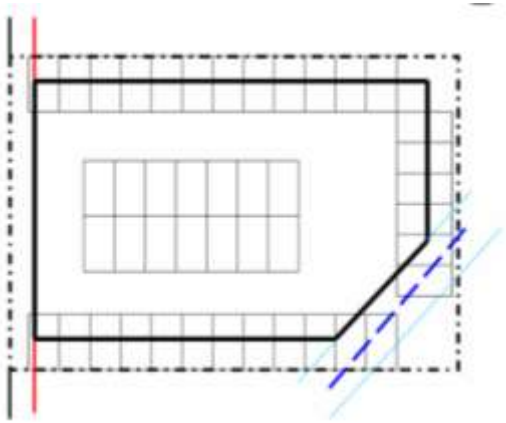
Other site issues to be considered when evaluating a potential site for a suitable parking facility include the following:

- Site Survey – a topographic survey of the site is a very important precursor to develop a conceptual plan. The site survey should delineate property lines, easements, and utility lines.

- Site Slope – The topographic information will define the slope of the site. Sometimes the slope of a site can used to reduce internal ramping in a parking structure, resulting in significantly lower costs. A parking structure that is built into a hillside can also reduce the visual mass of the facility.

- Geotechnical & Soils – Obtaining a soils report with sample borings and a geotechnical analysis early in the design process is prudent. If soils with poor bearing capacity are present on the site, the added cost for structural foundations can be significant.

- Codes and Ordinances – Municipal ordinances often specify setbacks, building height and bulk limitations, floor area ratio to site area, etc. than can significantly affect the allowable area on a site for a parking structure. The local planning organization may also impose development guidelines that must be followed.



Concept Design

Much of the remainder of these guidelines addresses issues and elements of parking structures that should be considerations during the conceptual design phase.

Parking Structures for People

An overall design principal to keep in mind is that parking structures are for people. Designing to accommodate the users of a particular structure will help produce a better parking structure.

- Different user types will have different needs.
- Some user types may need to be physically separated to ensure revenue control or for security reasons.
- Different users require different pedestrian circulation systems.
- Parking space widths and circulation geometry needs vary depending on the user type.
- Some vehicular circulation system are better for specific user types:
    - Residential – Regular users enter and exit two times a day.
    - Education – May have peak loads in and out.
    - Hotel – Overnight guests, maybe event parking too.
    - Office – Low turnover. Regular users enter and exit two times a day.
    - Health Care Visitors –Wayfinding very important. Need to accommodate elderly drivers and passengers.
    - Health Care Staff – Shift time overlap and loading. Security issues, particularly at night.
    - Retail – High turnover. Occasional users - wayfinding to and from vehicle.
    - Elderly or Families with Small Children – Wayfinding again important. May need larger spaces and more elevators.

- Events – Easy quick loading and unloading of structure. Multiple vehicular paths. Consider revenue collection methods, typically a flat fee on entry. Provide queuing space. Consider pedestrian flow to event - avoid crossing traffic.
- Multiuse Garages – These guidelines focus on parking garage design for downtown Norman. Most of the garages in downtown will serve at least two user groups – short-term and long-term parkers – and may serve many other user groups. This is due to the fact that future garages will be located in activity centers that include office, entertainment, special event, restaurants, retail, lodging, and residential land uses – all of which have different parking characteristics. Attention should be given to creating entry, exit, and circulation designs that are flexible and adaptable to particular situations. Dual exit lanes that allow parkers with passes to exit quickly without having to wait in line with parkers who are paying should be considered to lower frustration levels for customers.

Circulation and Ramping

The basic circulation element for a parking structure is the continuous ramp with parking on both sides of the drive aisle. In continuous ramp structures, some of the parking floors are sloped in order for traffic to circulate from one level to another. Only on a sloping site that permits direct access to each level from the exterior roadways are ramps unnecessary; but they still may be desirable for internal circulation.

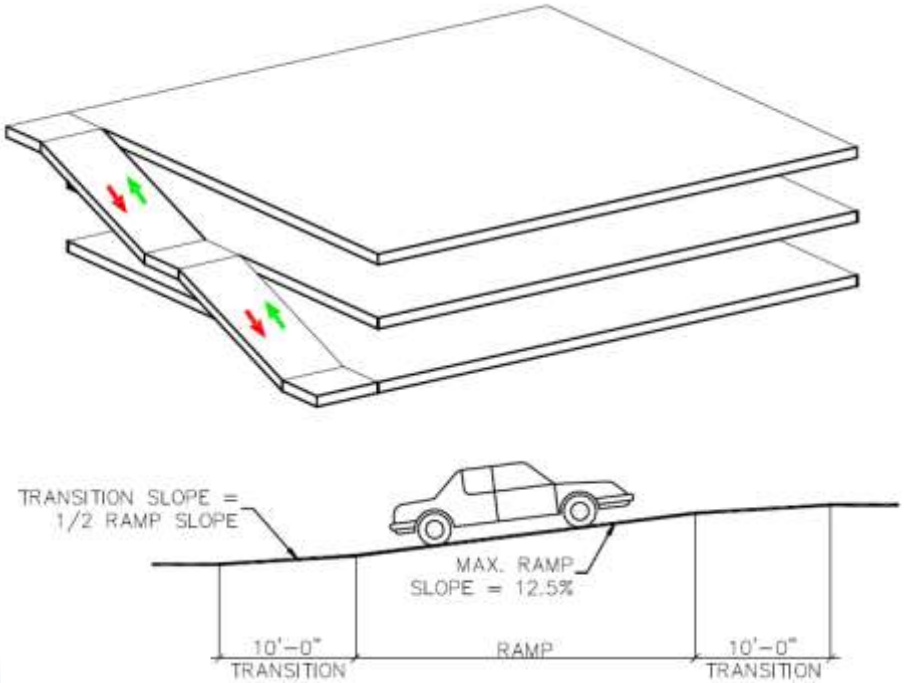
The basic criteria for choosing a circulation system are the simplicity or complexity of the system and the architectural compatibility. Ingress and egress capacities are also a consideration in the selection of a circulation system. Some circulation systems provide the opportunity for level façades which may be desirable.

A parking ramp slope of 5% or less is preferred, although parking ramp slopes up to 7% are tolerated by the public in very dense urban areas. Parking ramp slopes should not exceed a 6.67% slope, which is the maximum parking slope permitted in the International Building Code (IBC). The acceptable ramp slope must also conform to the current Norman City Building Code.

Non-parking ramps are often employed at airports, casinos, large retail structures, for special event structures, and on small and irregularly shaped sites. Non-parking ramps consist of circular helixes (most common), express ramps (external), and speed ramps (internal). Non-parking ramp slopes should have a maximum slope in the 12% to 14% range. Non-parking ramp slopes up to 20% are sometimes considered if covered or equipped with snow melt systems.

Parking structures with non-parking ramps tend to be less efficient in terms of square feet of structure per parking space which directly increases the construction cost per parking space.

A grade difference of 8% or more requires transition slopes so vehicles do not bottom out. Recommended are minimum 10'-0" transition slopes at the top and bottom of the ramp that are one-half of the differential slope. For instance, two 10'-0" transition ramps sloped at 6.25% would be required at the bottom and the top of a ramp sloped at 12.5%.



One-Way vs. Two-Way Traffic

One of the primary factors in the design of parking structure is determining the traffic flow: one-way or two-way. Typically, a parking bay for a one-way traffic flow is narrower than for a two-way flow. The available site dimensions will influence the parking bay width and thus also influence the circulation pattern. There are advantages and disadvantages to both circulation patterns. One-way traffic flow should never be combined with 90° parking. In parking facilities with one-way traffic flow, the angle of the parking stalls establishes the direction of vehicle traffic.

Advantages of One-Way Traffic Flow:

- Easier for parkers to enter/exit parking spaces.
- Vehicles are more likely to be centered in angled spaces.
- Less circulation conflict and reduced potential for accidents.
- Better visibility when backing out of a stall.
- Separation of inbound and outbound traffic and improved flow capacity of the circulation system.
- The intended traffic flow is self-enforcing.
- One-way traffic allows the angle of parking to be changed to accommodate changes in vehicle sizes.

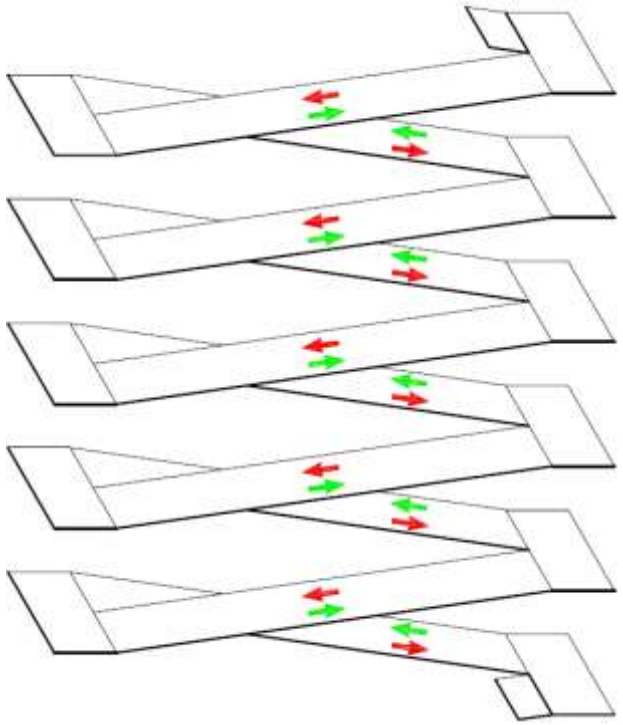
Advantages of Two-Way Traffic Flow:

- Wider drive aisles allow parkers to pass other vehicles.
- Wider drive aisles are safer for pedestrians.
- Better angle of visibility when searching for a parking space.
- Traffic flow follows its own pattern rather than one that is forced.
- Two-way traffic and 90° parking makes more efficient use of parking aisles (more spaces in a run).
- Two-way parking facilities can essentially operate as one-way facilities when there is heavy directional traffic.

Single Threaded Design

In order to develop a reasonably efficient free-standing parking structure, the **minimum** dimensions needed are about 122 feet in width by 155 feet in length. A width of 122 feet allows for a two-bay facility with two-way traffic flow and 90-degree parking. A facility with two-way traffic and a five-foot rise along each bay requires approximately 155 feet in length for a minimum floor-to-floor height of about ten feet. That is, one 360-degree turn within the facility equates to a vertical rise of ten feet. A structure in this configuration has sloping floors along both façade sides. However, sloping floors can make façade treatments challenging. On larger sites that allow a structure length of about 255 feet, one bay can be sloped rising 10 feet with opposite façade having a "level" floor.

Because of the number of 360° turns needed to ascend in a single threaded structure, the number of levels (floors) should preferably be limited to a maximum of six, otherwise the number of turns required and the number of spaces passed becomes inconvenient. A structure with a two-bay single thread design has a capacity for a maximum of approximately 750 spaces. The isometric diagram to the right represents a two-bay single-threaded helix.



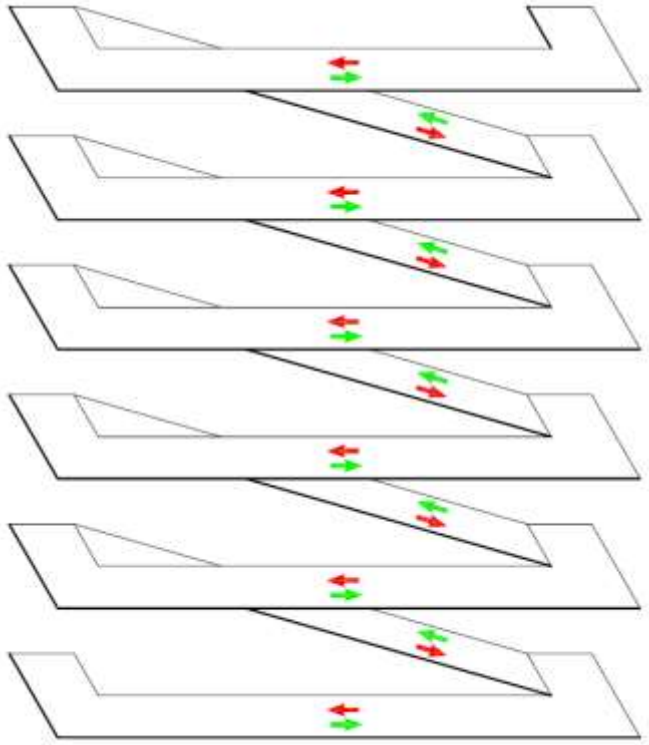
Single Threaded Helix with Sloping Floors

Principal Advantages of a Single-Threaded Helix:

- Repetitive and easy to understand for users.
- Potentially more flat-floor parking and level façade elements.
- Better visibility across the structure, which enhances security.

Principal Disadvantages of a Single-Threaded Helix:

- More revolutions required going from bottom to top and top to bottom.
- Two-way traffic bays have less flow capacity than one-way traffic bays. Traffic in both directions is impeded by vehicles parking and vacating a space.

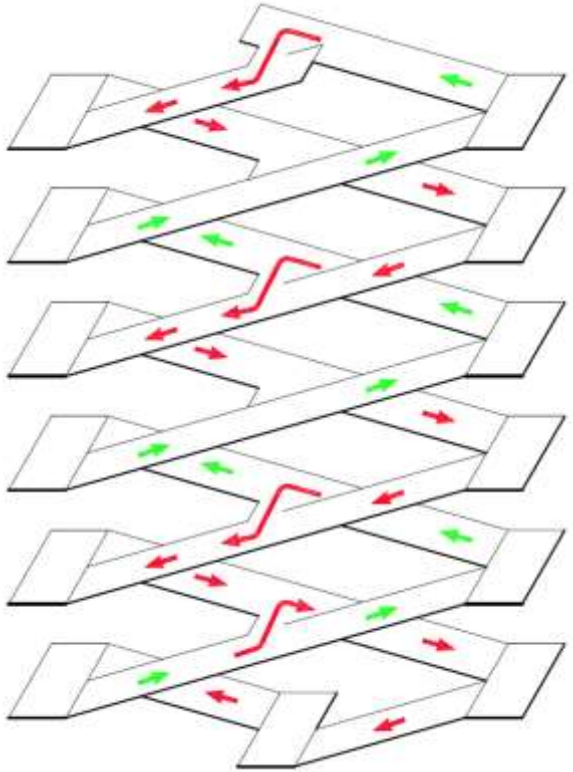


Single Threaded Helix with One Level Bay

Double Threaded Design

A facility with a one-way circulation system and angled parking can be provided in a double-threaded helix with modules ranging from 54 to 58 feet in width, depending upon the angle of parking. The preferred angles of parking for an efficient layout are 60°, 70° and 75°. A double thread, which requires a ten-foot rise along each module, requires 240 feet in length. More efficient layouts can be achieved on longer sites. The isometric right represents a two-bay double-threaded helix with one-way traffic.

A double-threaded helix can work with either one-way or two-way traffic flow, although one-way traffic is more common. A two-way double threaded design can be configured as two separate structures with no vehicular connection. A double-threaded helix rises two levels with every 360 degrees of revolution, which allows for two intertwined "threads" and the opportunity to circulate to an available parking space without passing all parking spaces as inbound and outbound traffic can be separated. Because of this, double-threaded helices are often recommended for larger facilities with seven or more levels. A two-bay double thread has a functional system capacity for up to approximately 2,000 spaces with angled parking and one-way traffic flow.



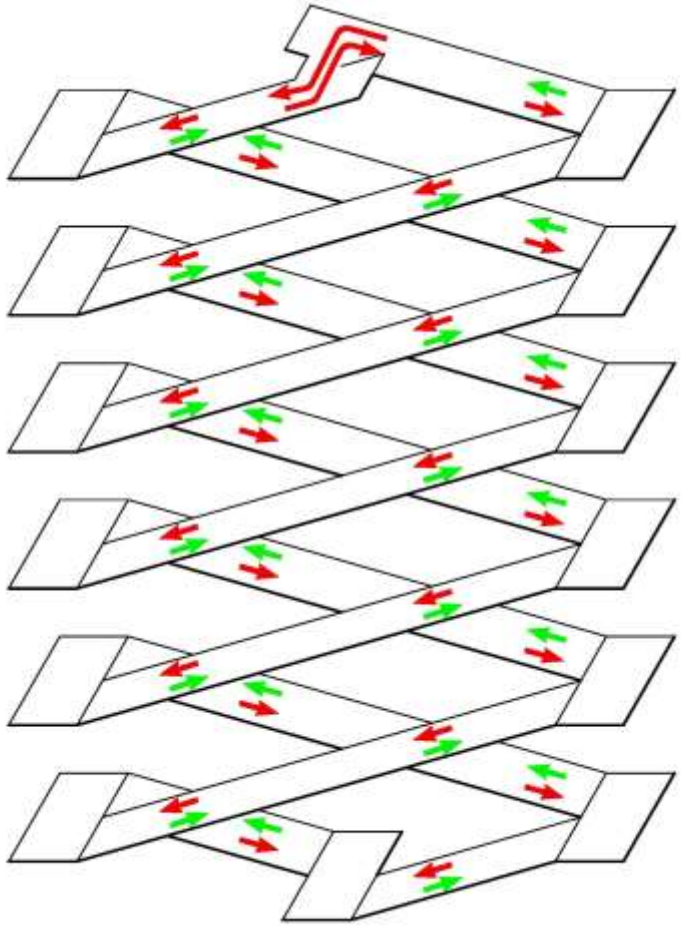
One Way Double Threaded Design

Principal Advantages of a Double-Threaded Helix:

- Efficient circulation and more traffic flow capacity
- Pass fewer spaces both inbound and outbound.

Principal Disadvantages of a Double-Threaded Helix:

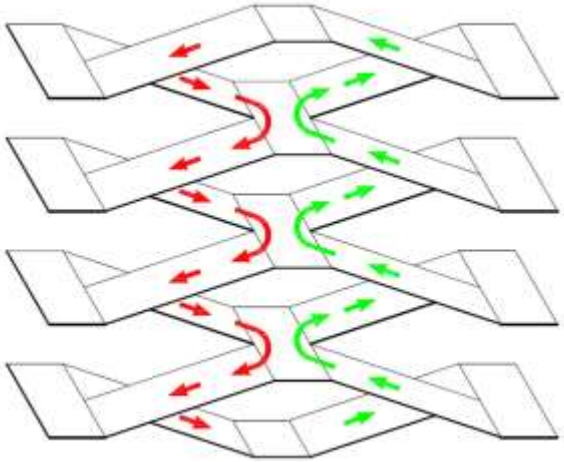
- Can be complex and confusing, particularly in finding one's vehicle upon return to the parking facility.
- Two-sloped bays and minimal flat-floor parking.



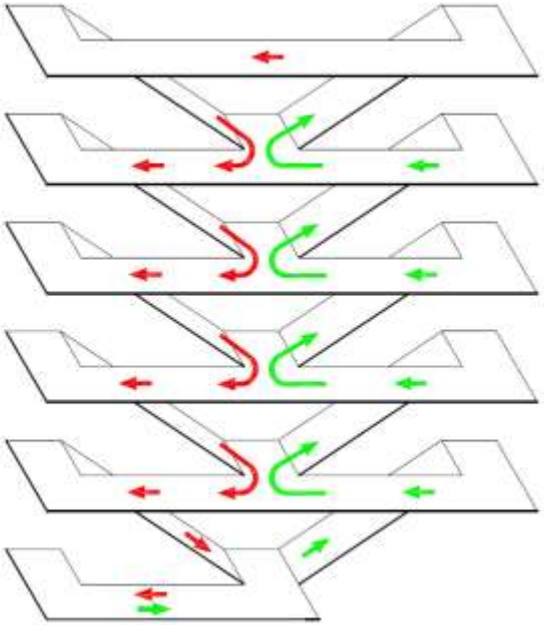
Two Way Double Threaded Desian

Other Circulation Systems

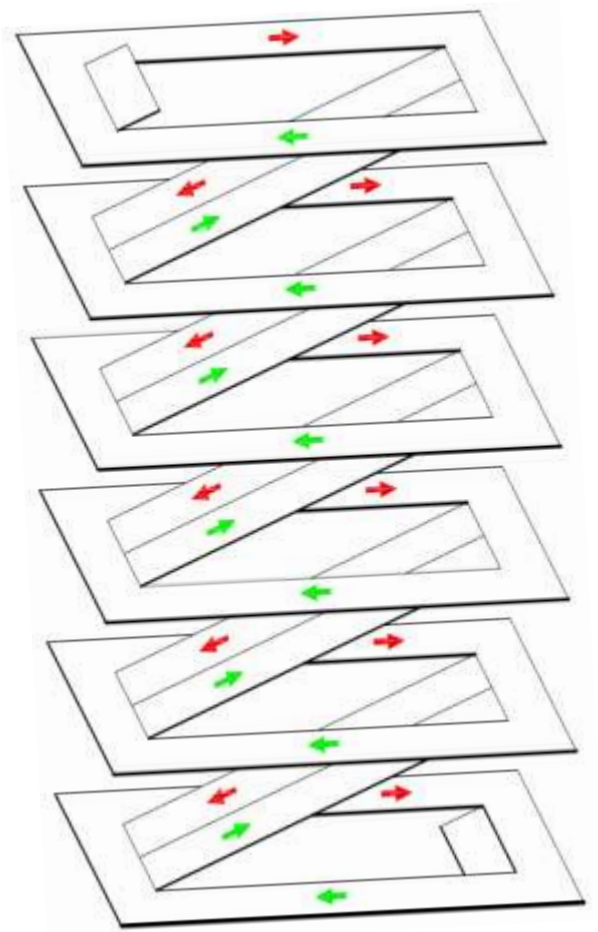
There are other parking and circulation systems that are often used in parking structures.



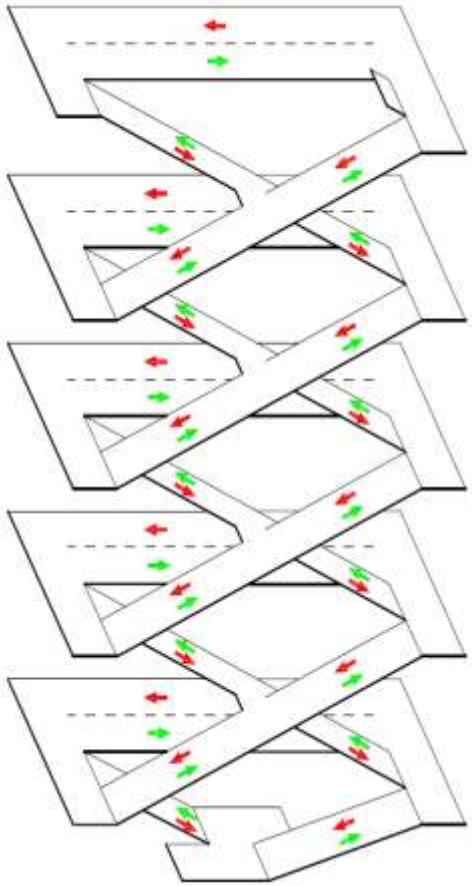
End-to-End Helix Both Bays Sloped



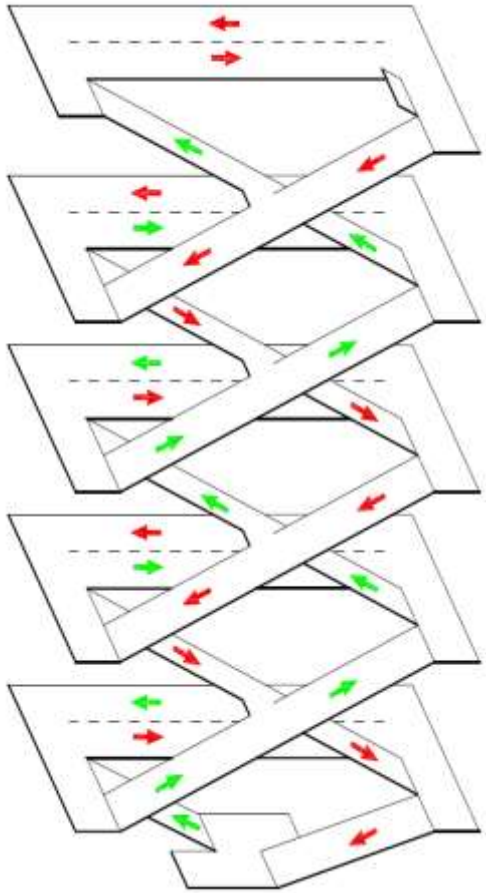
End-to-End Helix One Bay Sloped



Side-by-Side Helix



Two-way Double Threaded w/ Flat Bays



One-way Double Threaded w/ Flat Bays

Access Design

Vehicle entrances should be visible and easily identifiable. The minimum distance of entry/exits from corner intersections is at least 75 to 100 feet (preferably 150 feet). Entrances and exits should have clear lines of sight. It is preferable to enter a facility from a one-way street or by turning right from a two-way street and to exit a facility by turning right on a low-volume street. High traffic volumes and left turns can slow exiting and cause internal traffic backups. Consideration should be given to acceleration/deceleration lanes on busy streets. Gates should be located far enough away from the street to allow at least one vehicle behind the vehicle in the service position (at a ticket dispenser, card reader or cashier booth) without blocking the sidewalk. Entry/exit areas that have parking control equipment should have a maximum 3% slope.

It is very important to provide the appropriate number of entry/exit lanes to meet projected peak traffic volumes. The number of lanes is a function of user groups served, peak-hour traffic volumes, and service rates of the parking control equipment. It is recommended to have a parking professional prepare a lane and queuing analysis to guarantee sufficient entry and exit capacities.

Cross-traffic at entry/exits should be minimized and preferably eliminated. When placing vehicle entries and exits together on one-way streets it is preferable to avoid "English" traffic conditions where traffic keeps to the left instead of to the right. Pedestrian/vehicular conflicts should be minimized by providing a pedestrian walkway adjacent to entry/exit lanes. Stair/elevator towers should be located so pedestrians do not have to cross drive aisles on their way to primary destinations.

Important Issues for Vehicle Entry and Exit Lanes:

- The approach and the departure area from the lanes will also affect the rate of flow into or out of the structure. Tight turns equal a slower throughput.
- Pedestrian safety at entry and exit portals is paramount. Consider the vision cone of drivers entering or exiting the facility.
- Check and recheck vehicle turning radii at all entry / exit lanes and adjacent ramps.
- Vehicle queuing analyses should be performed to ensure traffic does not back-up onto the exiting street system or the inside of the facility during peak periods of traffic flow.

Parking Geometrics

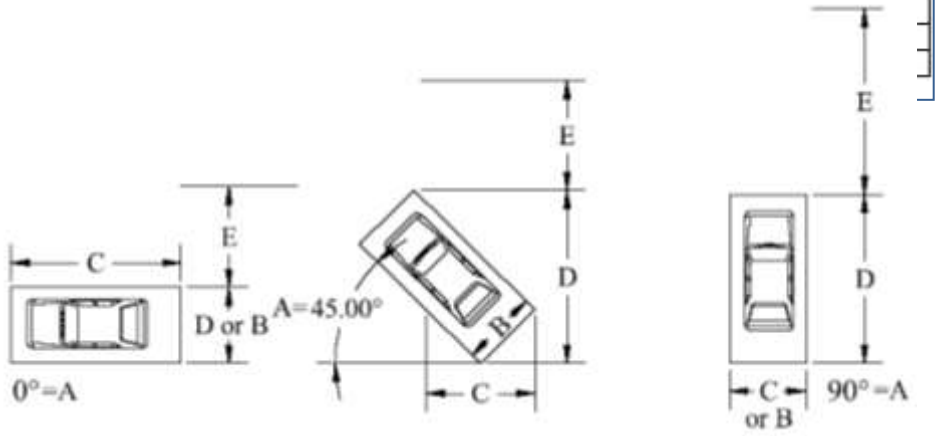
Parking geometrics refers to parking stall and drive aisle dimensions. Parking dimensions have been developed to comfortably accommodate the composite design vehicle, which refers to the dimensions of the 85th percentile vehicle in the range of vehicles from smallest (zero percentile) to largest (100th percentile). The composite design vehicle is the size of a Ford F150 truck (6'-7" x 17'-3").

The table on this page lists City of Norman parking geometrics by parking angle for standard and compact spaces.

Parking Angle A	Stall Width B	Curb Length Per Car C	Stall Depth D	Driveway Width E
0°	9'- 0"	23'- 0"	9'- 0"	12'- 0"
20°	9'- 0"	26'- 4"	15'- 3"	11'- 0"
30°	9'- 0"	18'- 0"	17'- 8"	11'- 0"
40°	9'- 0"	14'- 0"	19'- 6"	12'- 0"
45°	9'- 0"	12'- 9"	20'- 5"	13'- 0"
50°	9'- 0"	11'- 9"	21'- 0"	14'- 0"
60°	9'- 0"	10'- 5"	21'- 10"	16'- 0"
70°	9'- 0"	9'- 8"	21'- 10"	18'- 0"
80°	9'- 0"	9'- 2"	21'- 4"	20'- 0"
90°	9'- 0"	9'- 0"	20'- 0"	22'- 0"

MINIMUM STANDARDS FOR COMPACT VEHICLES

Parking Angle A	Stall Width B	Curb Length Per Car C	Stall Depth D	Driveway Width E
45°	7'- 6"	10'- 6"	16'- 0"	11'- 0"



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The city's parking dimensions for standard spaces exceed industry standards. The table on the following page lists parking geometrics by User Comfort Factor (UCF) which correlates with a Level of Service (LOS) approach. Traffic engineers developed the LOS approach to classify traffic conditions on roadways from A (free flow) to F (gridlock). The UCF/LOS approach has been adopted by many parking consultants to help classify conditions in parking facilities. The recommended UCF categories for parking geometrics are as follows:

UCF 4 = LOS A = Excellent
UCF 3 = LOS B = Good
UCF 2 = LOS C = Acceptable

LOS criteria should be related to the needs and concerns of users. Generally, users with low familiarity and high turnover should be accorded a higher UCF. If the city's parking standards are not used, we recommend minimum UCF 3 geometrics for moderate to high turnover parking (visitor, retail, etc.) and minimum UCF 2 geometrics for low turnover parking (employee, commuter, resident, etc.).

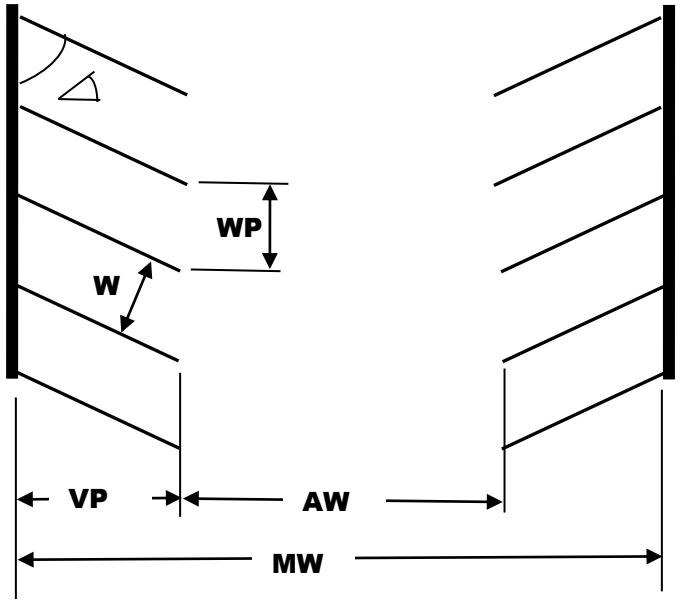
We recommend using "one-size-fits-all" parking spaces rather than segregating standard and small car spaces. However, if they are used, small car spaces should not exceed 15% to 20% of the total capacity of a facility.

Parking Layout Dimensions

PARKING LAYOUT DIMENSIONS

Parking Angle	Stall Width Projection (WP)	Module Width (1) (MW)	Vehicle Projection (VP)	Aisle Width (AW)
User Comfort Factor 4				
		w = 9'-0"		
45	12'-9"	49'-10"	17'-7"	14'-8"
50	11'-9"	51'-7"	18'-2"	15'-3"
55	11'-0"	53'-0"	18'-8"	15'-8"
60	10'-5"	54'-6"	19'-0"	16'-6"
65	9'-11"	55'-9"	19'-2"	17'-5"
70	9'-7"	57'-0"	19'-3"	18'-6"
75	9'-4"	58'-0"	19'-1"	19'-10"
90	9'-0"	62'-0"	18'-0"	26'-0"
User Comfort Factor 3				
		w = 8'-9"		
45	12'-4"	48'-10"	17'-7"	13'-8"
50	11'-5"	50'-7"	18'-2"	14'-3"
55	10'-8"	52'-0"	18'-8"	14'-8"
60	10'-1"	53'-6"	19'-0"	15'-6"
65	9'-8"	54'-9"	19'-2"	16'-5"
70	9'-4"	56'-0"	19'-3"	17'-6"
75	9'-1"	57'-0"	19'-1"	18'-10"
90	8'-9"	61'-0"	18'-0"	25'-0"

Parking Angle	Stall Width Projection (WP)	Module Width (1) (MW)	Vehicle Projection (VP)	Aisle Width (AW)
User Comfort Factor 2				
		w = 8'-6"		
45	12'-0"	47'-10"	17'-7"	12'-8"
50	11'-1"	49'-7"	18'-2"	13'-3"
55	10'-5"	51'-0"	18'-8"	13'-8"
60	9'-10"	52'-6"	19'-0"	14'-6"
65	9'-5"	53'-9"	19'-2"	15'-5"
70	9'-1"	55'-0"	19'-3"	16'-6"
75	8'-10"	56'-0"	19'-1"	17'-10"
90	8'-6"	60'-0"	18'-0"	24'-0"

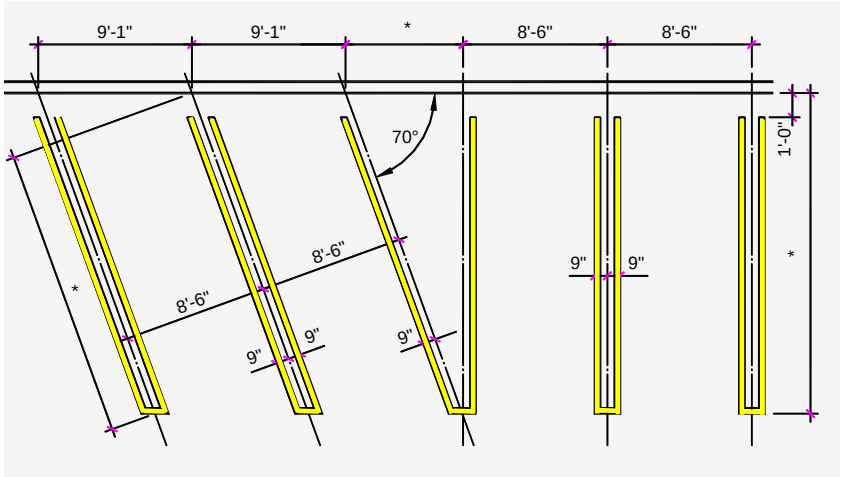


Note: (1) Wall to wall, double loaded aisle.

Parking spaces adjacent to walls, columns, elevators, stairs, etc. should be widened, if possible, by one foot so that vehicle doors can be more easily opened.

End bay drive aisles with two-way traffic should be a minimum of 26' wide for improved turning maneuverability. Wider end bay drive aisles are recommended for high turnover parking facilities. If possible, it is also suggested for more comfortable turns to hold back the first stall on either side of the turning bay. Small-Car-Only (SCO) spaces are also recommended at the ends of interior parking rows. It is very difficult to make a turn around only one row of parking. Refer to the following graphic.

Double stripes for space striping are recommended as they help parkers center their vehicles between stripes, maximizing the space between vehicles (refer to the graphic below). Also recommended is the use of traffic yellow paint for stall striping as yellow paint is more visible over time than white paint.



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Parking Layout Efficiency

Parking Efficiency is expressed in square feet of construction per parking space. Parking efficiency directly correlates with the construction cost per space. Build less structure per space and the cost per space drops. Non-parking speed ramps for example increase the square feet per space.

Parking efficiency should be calculated considering the total parking structure size including the stairs and elevators and non-parking ramps. Any retail space that is incorporated within the structure is also usually included in the calculation.

Typical ranges of parking structure efficiencies are:

- Short Span Structural System = 330 to 390 Square Feet per Space
- Long Span Structural System = 300 to 340 Square Feet per Space
- Mixed Use Developments with retail, residential and parking can be as high as 400+ square feet per space

PARKING EFFICIENCY MAKES A BIG DIFFERENCE – EXAMPLE

- 360 sf / space X 500 spaces X $45 / sf = $8,100,000
- 330 sf / space X 500 spaces X $45 / sf = $7,425,000

A difference of $675,000 or $1,350 per space!

Pedestrian Requirements

Pedestrian traffic is equally as important in a parking structure as vehicle traffic. A safe, secure and well signed pedestrian path must be provided. Pedestrian access at the grade level should be separated from vehicular ingress and egress. Pedestrian access is usually adjacent to stair/elevator towers. It is also desirable to place a dedicated pedestrian aisle adjacent to a vehicle entry/exit because pedestrians are naturally attracted to these openings. Maximum lines of sight for both pedestrians and vehicles should be provided, and mirrors and warning devices should be incorporated when necessary. Access locations should be restricted to a few locations for security reasons.

A minimum of two stairs are required to meet code-required means of egress for fire exits in parking structures. Stairs shall be open or glass enclosed and be visible to the street for security reasons. The minimum stair width in parking structures is 44" and wider stairs are required for special events. Travel distance between exit stairs is specified in the IBC and is a maximum 300 feet without a sprinkler system and 400 feet with a sprinkler system. Stairs are usually placed in dead corners.

Elevators should be located at terminus in the direction of pedestrian travel. Hydraulic elevators can be used for up to 5 levels or 50' to 60'. Traction elevators should be used beyond 5 levels. The minimum capacity and size is 3,500 lbs. and 5'-0" x 7'-0". The number of elevators is based on the number of spaces, the number of levels, user group(s) served, peak-hour flow rates, and the size and capacity of the elevator. A parking consultant can provide a preliminary indication of the number of elevators based on a formula that takes into account the information presented above. **We highly recommend that elevators have glass backs for security reasons.** Enclosed lobbies are recommended for protection from the elements on the top level.

Accessible Parking Requirements

The following table presents the required number of accessible parking spaces based on the total number of spaces provided in any given facility.

The accessible parking requirement for an institution like a hospital campus is not based on the total parking capacity but rather on the capacities of the individual facilities within a parking system, which always results in the provision of more accessible spaces overall. Accessible spaces for the institution do not have to be provided in each parking area, but can be supplied at a different location provided at least equivalent accessibility in terms of distance, cost, and convenience is provided.

All accessible spaces are 8' wide with either a 5' or 8' access aisle. An accessible space and access aisle cannot be placed at a location with a running or cross slope greater than 1:50 (2%).

The current 1 to 8 ratio for the provision of van accessible spaces is changing to 1 to 6, and it is required to round up to the nearest whole number when determining the number of van spaces. The barrier free section of the International Building Code (IBC) has the same requirement. It is recommended to use the new 1 to 6 ratio when determining the number of van spaces. Van accessible spaces require minimum 8'-2" vertical clearance and have 8'-0" wide access aisles.

Each accessible space must have a sign showing the international symbol of accessibility mounted at least five feet above the pavement. All van accessible spaces must have an additional "Van Accessible" sign mounted below the symbol of accessibility (mount minimum of 5' above pavement with other sign above).
ADA requires rounding up to the next whole number when calculating the required number of spaces based on a percentage or ratio. For example, a parking facility with 810 spaces will have 17 accessible spaces (810 x .02 = 16.2 = 17 spaces), and 3 spaces will have to be van accessible (17 ÷ 6 = 2.833 = 3).

Required Accessible Spaces	
Total Spaces in Facility	**Minimum Accessible Spaces**
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1,000	2% of total
1,001 and over	20 plus 1 for each 100 over 1,000

Accessible stalls cannot share access aisles when the parking is angled. Access aisles for van spaces must be on the passenger side when the parking is angled because vehicles cannot back into these spaces.

All accessible spaces must have an accessible route to public streets or sidewalks, accessible elevators, or accessible building entrances. An accessible route must have a minimum unobstructed width of 3'. A vehicle way (drive aisle) may be part of an accessible route, although it is preferred to place the accessible route at the front of the stalls. An accessible route can only pass behind other accessible spaces. It is permitted to cross a vehicle way with an accessible route. Automatic or push button door opening devices will be needed if the accessible path includes doors that patrons will need to enter/exit.

The running slope along an accessible route cannot exceed 1:20 (5%) and the cross slope cannot exceed 1:50 (2%).

It is recommended to cross hatch all access aisles and accessible routes.

Ultimately, accessible parking must be provided as required by existing city building and zoning codes. However, it is recommended that the standard ADA requirements detailed in this section be used if they exceed existing city requirements.

Safety and Security

Because curbs can be a potential tripping hazard, curbs in all pedestrian areas (at the end of parking rows, around stairs and elevators, dead corners, etc.) are strongly discouraged. The faces and edge of curbs that remain should be painted traffic yellow to enhance visibility.

Glass-backed elevators and glass enclosed and/or open stairways, visible to the adjacent street, are highly recommended for enhanced security. Security fencing should be installed below stairwells to eliminate the possibility of a person hiding under the stairs.

Lighting that enables users to see and be seen is one of the most important security features of a parking structure. A separate discussion on lighting is included in these guidelines.

Other important aspects of security design:

- Short span construction is not recommended. In short span construction, the columns are placed more closely together; thereby adding additional obstructions to lines of sight.
- Security fencing at the ground level should not be climbable. Security fencing ensures pedestrians enter/exit the facility only at designated pedestrian points.
- Landscaping should not provide hiding places.
- Security cameras are a deterrent to criminal activity.
- Panic alarms and two-way communication systems are recommended in prominent locations on each level.

In general, assure that as much openness as possible is provided in the design to improve sight lines, eliminate hiding places, and enhance perceived security.

Lighting

- Key Security Measure
- Enhances User Comfort & Perception of Safety
- Business Attraction Amenity
- Permit Safe Movement for Pedestrians and Vehicles
- Enhances Signage Visibility
- Typically Light Levels Are Not Code Regulated
  - Except Emergency Lighting @ 1 footcandles Minimum
- Industry Standards
  - Illuminating Engineering Society of North America (IESNA)
  - They Publish Minimum Standards
  - Liability Risk for Non-Compliance

The recommended lighting standards listed in the table to the right, slightly exceed the Illuminating Engineering Society of North America (IES) lighting standards for parking facilities. Staining the ceilings white to enhance light levels is suggested.

Recommended Parking Structure Lighting Standards

Areas	Minimum Horizontal Illuminance on Floor Footcandles	Minimum Vertical Illuminance at 5 feet Footcandles	Maximum to Minimum Uniformity Ratio
General Parking & Pedestrian	2	1	10:1
Ramps and Corners			
Days	2	1	10:1
Nights	1	0.5	10:1
Entrance Areas			
Days	50	25	10:1
Nights	1	0.5	10:1
Stairways	7 avg.		10:1

Lighting Entry and Exit Lanes

- Provide Additional Lighting (50 fc) for 10'- 60' Zone from Building Edge (Transitional lighting)
- Include Daylight Infiltration (> 15 fc)
- Typically, 10' X 10' Spacing of 150 W Fixtures
- Turn 2/3 of Fixtures Off @ Night

Light Source Types

- **High Pressure Sodium**
  - Golden White HPS Light Color
  - Common Parking Structure Lighting
  - Lamp Life = 24,000-28,500 Hours
- **Metal Halide**
  - White Light Color
  - Perceived Greater Brightness
  - Lamp Life = 15,000 Hours
  - Operating Cost Slightly **>** HPS
- **Light Emitting Diode (LED)**
  - Emerging Technology
  - Energy Efficient
  - Long Life
- **Fluorescent**
  - White Light Color
  - New Technology – Use in Cold Climates
    - Cold Weather Ballast (If Temps **<** 50° F)
    - Phosphor Coating
    - Sealed Fixtures
  - Lamp Life = 30,000 Hours
  - Energy Cost Effective
- **Induction Lighting**
  - White Light – Best color rendition
  - Instant Ignition Long Life Bulbs = 100,000 Hours
  - Energy Efficient
  - High Initial Costs

Lighting Expense Reduction Strategies

We recommend that the exterior bay lighting of "open" parking structures as well as roof top lighting be on separate circuits so that these lights can be turned off during the day to reduce energy consumption/costs as depicted in the lower picture on the right.

Signage and Wayfinding

Parking facilities can be very large, complex, and confusing. A well-designed graphics and signage system will effectively communicate necessary information to patrons, reduce confusion, improve safety, and enhance the overall user experience.

Sign messages should be simple and succinct. Messages on signs that are to be read quickly, such as vehicular signs, should be no more than 30 characters and six words in length. The typeface used should be simple and easy to read, and there is a general preference for Helvetica medium in the parking industry. Signs with lower case letters and initial caps are most easily read. The simple block arrow is recommended for parking signs. If a left turn is required, the arrow should be placed on the left side of the sign. The opposite is true for a right turn.

In parking structures, signs with a dark background and white letters are more easily read than signs with a white background and dark letters. The opposite is true in surface lots, where signs with white background and dark letters are better.

Vehicle Signs

Examples of vehicular signs include "Park" and "Exit" directional signs. Vehicular signs are ten or twelve inches in height with six or seven inch letters. Ten-inch signs are recommended for precast structures where sign visibility can be a problem. Vehicular signs should be centered over the drive lane or centered over the drive aisle when signs are mounted back-to-back.

Pedestrian Signs

Examples of pedestrian signs include "Level #," "Remember Level #," "Row #,"and "Stair" and "Elevator" identification and directional signs. Pedestrian signs can be all one color or be color-coded by level. Pedestrian signs should be clearly distinguishable from vehicle signs so as not to interfere with vehicular traffic. Pedestrian signs in parking bays are most effective if located perpendicular to traffic flow, and they should be placed at the rear of parking stalls. Color-coding is often used to help patrons find their vehicles. It is not necessary to provide color-coding in parking facilities that are three levels or less. When color coding, it is recommended to use primary and secondary colors including red, blue, yellow, orange, purple, and green. If there are more than six levels that need to be color-coded, it is recommended to use white, brown, and black. Confusing colors such as turquoise (blue or green?) and taupe (brown, tan, or gray?) should be avoided.

The elevator core area provides an excellent location to utilize super graphics. Super graphics is defined as a graphic that covers a large area and is generally painted on a vertical surface, such as painted walls or elevator doors, with level designation incorporated.

Once colors have been determined, the color coding must appear on each parking floor (e.g., on columns and walls) and adjacent to elevator lobbies and stairwells – as well as inside elevators.

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Level Theming

"Level Identification Theming" and other wayfinding aids provides an opportunity to enhance parking interior environment enhancement while also providing a practical tools to assist patrons in remembering where they parked. Several creative examples or illustrated below.

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Entry Signs

Emphasizing the entrance to a parking facility is important. Large illuminated signs are often used to emphasize the facility entry and attract patrons. These signs often spell out "Parking" or use the International symbol for parking. Architectural features, such as an arch, canopy, or some different treatment of the façade, are often used to highlight the entry area as well. A height clearance bar is required for all parking structures, including the top (surface) level of below-grade facilities to prohibit over-height vehicles. Generally, the height clearance bar is located at the facility entrance(s). There may be instances when the clear height in a parking structure changes from one level to another (for example, a higher ground level than typical level to accommodate ADA vans), which may require additional height clearance bars within the facility itself. Generally, the height clearance bar is an eight-inch PVC pipe.

Regulatory Signs

Regulatory signs are often used in parking facilities. Examples include "STOP," "YIELD," "ONE WAY," "NO PARKING" "DO NOT ENTER," and accessible parking signs. When used it is imperative that they comply with local and federal requirements. The Manual of Uniform Traffic Control Devices (MUTCD) provides examples of standard highway signs.

Illuminated Signs

Illuminated signs are becoming more and more common in parking facilities. Technology has advanced significantly in recent years and illuminated signs have become more reliable. Generally, illuminated signs are used for the following parking applications:

- Entry and Exit Lanes (Open in green/Closed in red)
- Facility Full Signs
- Stop (red)/Go (green)
- Level Space Capacity
- Directional Control
- Fee Display
- Space Count Systems
- Variable Message Signs

Pavement Markings

Pavement makings should conform to Manual of Uniform Traffic Control Devices (MUTCD) or local standards. MUTCD specifies that white paint be used for markings for traffic flow in the same direction and yellow paint used for traffic flow in opposite directions, which implies a warning.

Pavement markings can be an effective way to direct and control traffic flow in a parking facility. However, pavement markings must be re-applied due to wear and deterioration from vehicular traffic. Pavement arrows may enhance traffic flow. They are often utilized on surface lots or the top level of parking structures where overhead directional signage is not possible. Traffic arrows are also commonly used in facilities with a combination of one-way and two-way traffic flow.

Drainage

Proper floor drainage is essential for all types of parking structures in all climates. While direct rain or snow may not enter all areas of the parking garage, windblown rain and snow and/or vehicles carrying ice, snow and water will distribute water throughout the facility. Heavy rains will also overload top floor drains and water will run down the ramped floors to lower levels. In addition, the frequent floor wash-downs (e.g., washing the parking surfaces/floors) that should be part of a good maintenance program are a source of water throughout the parking facility. If the floor is not adequately sloped, water is allowed to pond and deterioration will accelerate beneath the ponds.

A design slope of 2%, or ¼ inch per foot, is desired, with a minimum design slope of 1-½%. Water should be drained away from exterior columns/walls and pedestrian paths. Washes may be needed in slab corners to achieve drainage slopes.

Floor drain locations are determined by the circulation system, number of bays, and structural system. The top-level drain system should be designed to accept a 10-year design rainfall or as required by local code. Three to four-inch piping is generally used on covered levels.

Open or Enclosed Parking Structure

Natural ventilation requires openings in exterior walls of sufficient size distributed in such a way that fresh air will enter the facility to disperse and displace contaminated air. The 2003 and 2006 International Building Code (IBC) states:

> *"For natural ventilation purposes, the exterior side of the structure shall have uniformly distributed openings on two or more sides. The area of such openings in exterior walls on a tier must be at least 20 percent of the total perimeter wall area of each tier. The aggregate length of the openings considered to be providing natural ventilation shall constitute a minimum of 40 percent of the perimeter of the tier. Interior walls shall be at least 20 percent open with uniformly distributed openings."*

> *"Exception: Openings are not required to be distributed over 40 percent of the building perimeter where the required openings are uniformly distributed over two opposing sides of the building."*

Setbacks can affect openness as firewalls are required if certain distance requirements from property lines and other buildings are not maintained. Parking structures are typically classified as enclosed if other uses (retail, office, residential) are located above the parking, but may remain open if parking is above or adjacent other uses. When a parking structure is positioned below grade, areaways can be used to achieve natural ventilation. The building code addresses the geometry required to permit acceptance of an areaway.

Parking structures classified as "open" do not require mechanical ventilation, fire suppression (sprinklers), and enclosed stairs.

"Enclosed"

- **Enclosed Shafts**
- **Mechanical ventilation**
- **Increased illumination**
- **Increased fire rating**
- **Fire sprinklers**

"Open"

- **"Open" structures are allowed much larger floor plates and many more levels**
- **"Open" structures are naturally ventilated, so do not usually need mechanical ventilation**
- **"Open" structures do not require stairs to be enclosed**
- **"Open" structures allow a lot of natural light**

Structural Systems

Following are the advantages and disadvantages of the three primary structural systems commonly used in parking structures today:

- ***Cast-in-Place Concrete***
- ***Precast Concrete***
- ***Steel Framed***

The selection of the structural system should be given careful consideration. The decision is often made based on the following:

- Owner preference
- Design team preference
- Development Review Agency (or Agencies) input
- Schedule
- Construction budget
- Openness and perceived headroom
- Owner's tolerance and budget for maintenance
- Local availability of product and labor

Cast-in-Place Concrete

Advantages of Cast-in-Place Construction:

- Monolithic construction so fewer sealant joints
- Positive drainage is easier to achieve
- Post-Tensioning forces reduces slab cracking
- Floor vibration imperceptible
- Flexible column spacing (20' to 27')
- Generally no shear walls
- Lower maintenance cost
- Wide beam spacing creates more open feeling with perception of higher ceiling
- Accommodates parking structures on irregular sites, beneath buildings, and underground

Disadvantages of Cast-in-Place Construction:

- Potentially higher construction cost
- Quality control is more difficult to attain due to exposed weather conditions
- May require architectural cladding to improve exterior aesthetics
- Less adaptable to winter construction in cold climates
- Longer on-site construction schedule
- Closer expansion joint spacing
- Congestion of tendons and rebar at beam column joints
- Larger on-site staging requirement

Precast Concrete

Advantages of Pre-Cast Construction:

- Quality control because members are fabricated at a plant
- Potentially lower construction cost in some regions
- Shorter on-site construction schedule
- Greater expansion joint spacing (up to 300 feet)
- More adaptable to winter construction
- Architectural façade spandrels also serve as structural load bearing elements

Disadvantages of Pre-Cast Construction:

- More propensity for leaking at the joints
- Higher maintenance cost for sealants
- The close spacing of thee tee stems creates the perception of lower ceiling height
- Tee stems can block signage and interfere with lighting distribution
- Shear walls affect architecture at the exterior and reduce visibility at the interior
- Reduced drainage slopes
- More bird roosting ledges
- Might not be performed by local subcontractors

Steel Framed

Advantages of Steel Construction:

- Flexible column spacing of 18' to 22'
- Generally no shear walls
- Can be performed by local subcontractors
- Shorter on-site construction schedule
- Potentially lower construction cost
- Easily accommodates vertical expansion

Disadvantages of Steel Construction:

- Erection concerns due to mixing foundation, steel, and precast subcontractors
- Not recommended where the steel is required to be fire rated by the building code
- Depending upon code requirements, steel structure may need to be fireproofed
- Steel painting for corrosion protection
- Maintenance of steel paint system
- Steel delivery times can fluctuate
- Extensive bird roosting ledges on the beam flanges

Durability Design

It is recommended to perform an analysis in the schematic design phase to determine which durability elements should be included in the design of a parking structure. These elements include sealers, deck coatings, concrete additives, corrosion inhibitors, and epoxy coated reinforcement. Durable parking structures also require quality concrete (low water-to-cement ratio), adequate concrete cover, proper concrete curing, and good drainage. Tradeoffs between initial costs and long-term maintenance costs should be considered. Enhanced durability systems should be provided in areas with severe exposure, such as supported structure near vehicular entries and snow storage areas on the roof level. Deck coatings (membrane) are recommended over occupied space and over electrical and storage rooms.

The design of a parking structure should at a minimum conform to the intent of American Concrete Institute's Guide for the Design of Durable Parking Structures (ACI 362). The design life of a parking structure should be 60 years.

Incorporating Other Land Uses

Many cities today are encouraging or requiring the design of parking structures that enhance the urban environment. Design Guidelines have been established that require parking structures to have level façades on the street sides (no exposed ramps) and pedestrian-active uses on the ground level. Even if not required by local code, there has definitely been a trend away in recent years from stand-alone, single-purpose parking structures. The development of ground-floor retail space in parking structures is often encouraged as even second-rate retail space will typically generate more income per square foot than a good parking space. This is an important consideration as most new parking structures are not self supporting. When selecting a site for the development of a parking structure, the site that offers the best possibility for ground-floor retail space should be an important consideration.

- New parking structures should incorporate other land uses (e.g., first level commercial space or commercial/residential space wrapping one or more sides) whenever physically/financially possible.
- First level commercial space will increase first level floor-to-floor heights and may necessitate adjustments to the structure's ramping scheme (e.g., inclusion of non-parkable speed ramps).
- Designs should minimize the impact of commercial space on the first level circulation system.
- Designs may need to consider loading dock space and garbage space in the parking structure.
- Restaurant space will need adequate ventilation, which may impact parking efficiency on the levels above the space.
- Entry/exit locations should be adequately positioned to account for adjacent traffic patterns and roadway conditions. Entry/exits should provide for easy identification and access from adjacent streets.

- Parking demand for the integrated commercial/residential land uses should be included in the parking supply and demand analysis for the structure.

- If there is no current market for additional commercial space, the parking facility could be designed to accommodate additional land uses in the future when market conditions warrant.

Other Considerations

There are other aspects of parking structure design that will not be specifically addressed but should be kept in mind, including:

- Zoning Requirements (permitted uses, setbacks, easements, etc.)
- Building Code Compliance
- Subsurface Conditions and Foundations
- Aesthetics
- Fire Rating, Fire Protection and Life Safety
- Mechanical Systems
- Storm Drainage and Water Storage
- Parking Access and Revenue Control Equipment
- Impact of Mixed Uses (retail, residential and office)
- Parking Office Requirements
- Maintenance

Appendix 25

Parking System Financial Plan Template

This document provides a template for creating parking system financial plan.

MUNICIPAL PARKING PROGRAM

PARKING GARAGE SYSTEM FINANCIAL PLAN TEMPLATE

Overview:

For large municipal parking programs, having a detailed and well-defined financial plan is considered an industry best practice. The program financial plan would ideally address the following major elements:

- Program Overview
- Program Background
- Planning and Policy Framework
- Key Operational Objectives
- Fund Balance and Reserve Policy
- Uses of Parking Revenues Policy
- Debt Policy
- Rates Policy
- Annual Updates

The following document is a template for developing a recommended parking system financial plan (with sample text for illustrative purposes only).

MUNICIPAL PARKING PROGRAM
PARKING GARAGE SYSTEM
FINANCIAL PLAN TEMPLATE

Date: _____

Introduction

Brief description of the parking programs origins, history and purpose.

Example text:
The City owned parking garage system was established in the 19__'s to meet a number of City objectives including downtown economic vitality, providing a balanced transportation system, and financial stability. The garages have been very successful in meeting these objectives, as noted elsewhere in this Plan. However, the City, and the parking garages, find themselves in a very dynamic environment. Careful planning is essential if the system is to continue to fulfill its mission, and do so in a financially sound manner. This Financial Plan establishes the financial policies and procedures that will ensure the operational and financial success of the system.

Background

The City of _____ owns five parking garages in downtown _____. They are:

Garage A	550 spaces
Garage B	700 spaces
Garage C	350 spaces
Garage D	541 spaces
Garage E	723 spaces
Total	**2,864 spaces**

Example text:

All of these facilities are in the Parking Facilities Fund. Planning is underway for a sixth garage.

The City has contracted with _Company X_ since (date) to provide day-to-day management of the garages. Company X in turn has a number of subcontracts to provide operations, security, janitorial, sweeping, and marketing services for the garages. Company X also manages the City's parking validation program.

The garages are known as the _ (Parking System Brand Name) _ garage system, and have a logo with that name and symbol.

Usage at the garages has grown rapidly in recent years, especially since we began the _ (Parking System Brand Name)_ marketing program X years ago. The garages are full frequently during the peak weekday hours from 10:00 a.m. to 4:00 p.m. Usage has also grown dramatically in the evening and weekend periods. As a result, the financial condition of the garages is strong, and getting even stronger. We have been able to catch up with all deferred maintenance, and are now on a regular capital maintenance schedule.

The garages also include some commercial retail space at (insert locations). This is managed by the (insert department or agency). Rates and policies are set by (insert department or agency) in accordance with standard industry practices in downtown _____.

If parking revenues are used to fund other community initiatives or programs, note here. Also include financial contributions or debt obligations if applicable.

Another element that could be addressed here are policies regarding the use of Parking Facilities Fund. See example language below:

"Annual debt service expenditures will be paid from parking system revenues. Short-term parking rates were recently increased by $__/hour to assist in paying this increased cost. The rate increase generates an additional $__ million per year. The remainder of the debt service obligation will be paid from existing net revenues of the parking system.

Additional policy statements or guidelines related to Parking Facilities Fund financial policies could be inserted here. Also, noted below are examples of "qualifying statements" related to use of parking fund policy decisions. See example language below:

1. Resources of the Parking Facilities Fund will be sufficient to fully meet system expenditures and the debt service requirements associated with approved parking fund contributions. However, adding a new garage may require an additional increase in short-term parking rates depending upon the terms of the new facility.

2. The reserve for future construction will decrease over the forecast period. It will not reach its desired maximum of $__ million until after bonds on _____ garage and _____garage is paid off in _year

x - year y_ and year x - year y _ time frames. However, reserves for major maintenance and operations will remain fully funded throughout the forecast period.

3. Council's decision to use the Parking Facilities Fund's net revenues for the _note special project name_ results in the probability that the fund, at current rates, will not be able to finance other transportation projects in the Central City for at least the next ten years. Neither will it be able to subsidize or otherwise assist Central City projects such as housing or a project in the _____ District.

4. The possibility still exists that an economic downturn could affect usage at the garage. Also, the financial performance of any new garage is uncertain. While the Fund Projection and this Financial Plan use relatively conservative assumptions, a worst-case scenario could have serious consequences, since there would not be as much financial flexibility in the Fund.

Planning and Policy Framework

This section of the Financial Plan describes the planning and policy framework that the financial plan is designed to support. It should address the mission for the system and identify specific tasks that need to be accomplished to ensure the continued success of the system. One of those tasks could be the completion of a Financial Plan as this document. Following is more example language and key recommended section elements such as a strategic mission statement, alignment with larger plans, preparation of an annual capital plan, preparation of a long-range major maintenance plan, development of an annual fund projection, etc.

Example text:

The Parking System Strategic Plan Mission Statement is:

Our mission is to support the economic vitality of the Central City by providing an affordable system of parking garages which primarily meets the short-term needs of shoppers, visitors and business clients and by investing in other Central City transportation improvements.

In _(year)_, the _____ Plan was completed. This Plan established a number of strategies needed to ensure that the _ (Parking System Brand Name)_ system continues to meet the demand for parking in the Central City. These strategies include construction of new facilities, restriping, rate adjustment, provision of bicycle and carpool parking, and other demand management techniques. This Financial Plan helps the City to ensure that we can afford all necessary strategies without undue risk.

In _(year)_, the _ (larger parking or downtown strategic plan or master plan) _ was completed. The XXX Plan is a part of a continuous planning process intended to promote economic vitality, livability, and environmental quality for Central City residents, workers and visitors. According to the XXX Plan, parking structures are the preferred method of providing parking in the Downtown to promote a compact and walkable urban environment. New parking structures will be built to promote the use of

alternative transportation, such as transit and carpool, to support existing and new economic development and to enhance the urban form of the Central City. Implementation of this Financial Plan would be consistent with policies of the XXX Plan.

All City divisions with capital assets are required to prepare an annual Capital Improvement Plan. The _ (parking department) _ has prepared such a plan for the garage system each year. The focus of this plan has been primarily the scheduling of major maintenance projects, so that they are completed in a timely manner, but in a way, that minimizes the financial impact in any one year.

In _(year)_, the _ (parking department) _ completed a detailed Long-Range Major Maintenance Plan for the garages. This plan identifies each of the major subsystems of the garages (elevators, electrical, structural, etc.). It notes the maintenance history of each and forecasts the maintenance needs of each for the next twenty years. It estimates the cost of each, and totals the costs by year so that we know how much we must plan to spend to ensure that each will continue to perform its function reliably.

For a number of years, the _ (parking department) _ has prepared a Fund Projection that forecasts revenues and expenditures for the system for the coming five years. This financial planning document helps us to ensure that the system's financial health is maintained. This Financial Plan incorporates the Fund Projection and will provide the basis for its future updates.

The current Fund Projection incorporates the following assumptions:

a. Parking revenue grows at __%, without a rate increase. This is due to increased demand, especially increased demand during off-peak (evening and weekend) periods.

Commercial rent revenue grows at less than __%.

Operations and maintenance expenses grow at __%. This is approximately the long-term _____ area CPI for this type of expense

d. Debt service is the established payment schedule for each of the debt issues.

e. CIP's are the annual average expenditure required for each garage and was determined by the _(year)_ major maintenance study.

Overall, parking revenues have grown in recent years by about __% per year. The reasons for this substantial growth include:

a. the growth in downtown retail

b. the very effective _(Parking System Brand Name)_ marketing program

c. effective management

d. the high level of customer service the system provides

e. reasonable rates

f. reliable availability of short term parking

g. the _(Date)_ rate increase from $__ to $__ per hour

Expenditures have grown about __-__%. This expenditure growth is due to:

a. inflation

b. increasing maintenance needs of an aging system

c. increased staffing to serve the growing number of customers

The difference between the revenue growth and expenditure growth is reflected in the increase in the size of the Fund Balance. This Fund Balance has in the past constituted the system's operating and maintenance reserves, and has been the resource for system expansion, in particular, the two-story addition to the _____ garage.

Operational Objectives

This section of the Financial Plan describes the system's operation objections. The program's basic objective is to accomplish the _ (Parking System Brand Name) _ Mission. See example language below:

Example text:

The following strategies applied to achieve the program vision and mission:

a. High quality customer service. Specifically, this means such things as ensuring an adequate number of well-trained attendants to provide courteous, efficient service when a customer leaves. We want to minimize the length of time they must wait, and to make their interaction with the program as pleasant as possible. In addition, we want them to feel safe and secure in the garage, and want them to have as clean and well maintained a facility as possible. This level of service gives us satisfied customers who will return to the garages and recommend us to their friends.

b. High quality maintenance. This means keeping the elevators operating virtually non-stop, replacing burned out lights promptly, repairing damaged sections of the garage quickly and completely, removing graffiti promptly, etc. It also means ensuring that the major and very expensive subsystems of the garages (lighting systems, structural systems, revenue control equipment, etc.) are repaired and/or replaced on a regular basis. Again, customers will feel more comfortable knowing that their garage can be relied on to function safely and effectively. We also keep our maintenance costs as low as possible by staying current and not having to fund inherently costly deferred maintenance projects.

c. Effective marketing. _ (Parking System Brand Name) _ operates in a very competitive environment. As part of downtown, we compete with the suburban malls for shoppers. For those motorists who do come downtown, we compete with privately owned garages and on-street meters, especially on evenings and weekends. We also face the challenge of the relatively widespread but incorrect perception that downtown parking is unavailable, inconvenient, expensive, and generally a hassle. We must sell the convenience and attractive price of _ (Parking System Brand Name) _ if we are to meet our mission. Thus, an aggressive marketing program is essential.

d. Effective management. The _ (Parking System Brand Name) _ provides a consistent, high quality level of management service. Through careful planning and attention to detail, we have ensured that customers have received the service they expect and the City demands. _ (Parking System Brand Name) _ has also provided careful and effective coordination with the downtown business community, which depends heavily on the success of the garages to promote their own business objectives.

e. Planning and Development. The _ (Parking System Brand Name) _ and related agencies and partners assesses parking demand and develops funding and development strategies on an on-going basis to ensure critical parking needs are met.

Fund Balance/Reserve Policy

This section of the Financial Plan describes the system's policies related to "fund balance and financial reserve policies". See example language below:

Example text:

The Fund will maintain three reserves:

1. An operating reserve of 10% of one year's total budget, not counting debt service.
2. A major maintenance reserve of one percent of the replacement value of the garages.
3. A capital construction reserve. Its size will be determined as described in the Annual Update.

Operating Reserve

The operating reserve standard is the level recommended by the Government Finance Officers Association. They recommend 5-10% depending on the level of risk. The appropriate point on that range depends on our assessment of the nature and degree of financial risk for the system. The risks to the City in the parking business are relatively high. They are:

Example text:

a. _ (Parking System Brand Name) _ operates in a competitive environment, which is rare if not unique in government. The competition comes from privately owned garages, parking meters, and especially suburban malls where parking is free. An economic downturn or other financial distress suffered by downtown business would be directly reflected in parking garage usage and revenues.

b. The City is in the parking business because we are expected to take on a level of risk that the private sector is not willing to assume. Parking in general is not inherently profitable if the rate is to remain affordable. In fact, the City's experience in all of our garages shows that we must expect losses in the early years if not the life of the garage debt. Affordable parking is critical to the success of downtown. Our rates must always be below market so that this important public objective can be achieved.

Given this inherently risky financial environment, a relatively high reserve is warranted. It will ensure that the system continues to remain financially healthy almost regardless of the social or economic environment.

The operating reserve will be used for the following purposes:

1. To maintain service levels when economic, social, or other conditions cause usage and revenues to decrease.
2. To fund investment opportunities that will allow the City to take advantage of business opportunities that will increase service and/or reduce costs.

Major Maintenance Reserve

The major maintenance standard is similar to one used in State statutes that sets reserve requirements for non-general fund facilities. Facilities such as parking garages that are exposed to the elements are especially prone to maintenance problems. Industry standards suggest that parking facility maintenance reserves should be in the range of $75/space/year. If we are to maintain a high level of reliability and customer service, we must be able to respond to any maintenance problem quickly. This reserve assures our ability to do so. Note that this reserve is in addition to the ongoing maintenance budget for the garages.

Example text:

The maintenance reserve will be used for the following purposes:

1. To fund one time, emergency, or unanticipated expenditure requirements that cannot be covered by the major maintenance or operating budget.

2. To maintain major maintenance project funding levels in the event of unanticipated revenue reductions.

3. To provide adequate cash flow when major maintenance projects exceed the annual average for them established in the CIP and major maintenance plan.

The Fund will not maintain a replacement reserve. By completing major maintenance projects each year replacement of the facilities can be deferred for a substantial period of time.

If the operating and maintenance reserves are lower than these amounts the Fund will use higher than budgeted revenues and/or lower than budgeted expenditures to replenish the reserve. If within one year the reserves are not replenished to the levels required by this Plan, the City will raise rates in an amount sufficient to bring them up to those levels within two years.

Capital Construction Reserve

The purpose of the Capital Construction Reserve is to fund, in part, the construction of new parking facilities. The City's experience shows that a new facility cannot be built and operated at a break-even basis for a long period of time, if at all, given the rate policy that we have adopted. Accordingly, a reserve is needed to provide the subsidy needed to allow a new facility to break even. If the capital construction reserve is not fully funded, _ (Parking System Brand Name) _ will evaluate the Fund Projection as part of the Annual Update to determine if forecast net revenues of the system will be sufficient to provide the cash financing needed for new facilities, by the time those facilities are forecast to be needed. If the Update shows that the Reserve will not be fully funded, the City will consider raising rates to fund it. This increase may occur prior to the expected construction of the new facilities. However, if an early rate increase would have a negative impact on the achievement of the Mission and Goals of the system, the increase may be deferred until needed to pay debt service and operating expenses of the new garage.

Example text:

◢ Policies Regarding Uses of Parking Revenues

This section of the Financial Plan describes the system's policies related to "policies regarding the approved uses of parking system revenues". See example language below:

◢ Expenditure Policies

1. The City will continue its policy of spending sufficient funds on basic services such as attendants, security, janitorial, minor maintenance, and marketing to ensure that customers consistently receive a very high quality level of service.

2. The City will continue its policy of carefully planning and funding major rehabilitation and maintenance of the garages so that they will continue to provide a high quality, consistent, efficient, and reliable service for the indefinite future. The City will update and implement those plans each year.

3. All expenditures will be consistent with the System's values established by the Strategic Plan, and will support the Mission and Goals set by the Strategic Plan.

4. The priority for the use of parking system revenues is as follows, and as reviewed in the Annual Update.

a. Operations and maintenance of all garages.

b. Debt service on the garages.

c. Funding the garage Operating Reserve and Major Maintenance Reserve.

d. Debt service on the bonds to which parking revenues have been committed to (if applicable).

e. Continuation of the ongoing transfers to other funds (if applicable) adjusted for inflation. However, if future City financial plans show that these transfers are no longer necessary, or are no longer the most efficient way to meet City expenditure requirements, this priority may be changed.

f. Funding the Capital Construction Reserve.

g. Funding other parking and traffic improvement projects, and assisting other Central City improvement projects such as high density, affordable housing, as allowed by state law.

◢ Policy Regarding Determining the Amount of a Fair Return

The City Attorney has advised the City that state statutes allows payment to the City of a fair return on its investment in a facility for the purpose of making additional parking and traffic improvements. The Attorney also advised that the determination of what a fair return means in dollars is an administrative decision.

There are two approaches to determining the amount of a fair return.

1. A conservative approach would be to use the Comprehensive Annual Financial Report (CAFR) values to determine the amount of the investment, and use the Public Utility Commission (PUC) formula for rate of return for regulated utilities (9.6%) as the rate of return.

2. Another approach would be to use replacement, or market value, and the PUC rate of return.

Use of CAFR values seems excessively conservative, because they do not reflect the true market value of the property. If the City were to sell the garages the net proceeds would be construction cost of an equivalent facility, plus land value, less depreciation and outstanding debt. This suggests that the

market value approach is more realistic. Accordingly, the policy is that the amount that is made available for these improvements is limited to the rate of return allowed by the PUC for regulated utilities, applied to the market value of the garages. The City may raise rates to fund these projects, consistent with the other goals and policies in this Plan and other Plans. The policy by which specific parking and traffic improvements will be funded will be established in the Annual Update.

Debt Policy

This section of the Financial Plan describes the system's policies related to "debt policy" related to the parking system". See example language below:

The City of _____'s Debt Policy will govern the debt policies and practices of the Parking Facilities Fund. An important feature of parking system debt is that the revenues of each of the garages in the Fund are cross pledged to the bondholders of the other garages debt. Another feature is that the coverage ratio for parking garage debt is enhanced by the pledge of net parking meter revenues.

The City has consistently used the net revenues of the downtown core garages to cover the financial shortfalls of the _____ garage(s), and will continue to do so. However, the City has never needed to use net meter revenues to support the garage debt or operations. It is the City's policy that the garages will be managed in such a way that whenever possible net meter revenues will not be used in that way in the future.

The coverage ratio required by the bond covenants varies, but is averages approximately 1.5. It is the City's policy that the Fund will achieve the ratio on its own, without use of net meter revenues, whenever possible.

Rates Policies

This section of the Financial Plan describes the system's policies related to "rate setting" related to the parking system". See example language below:

Rates will be set to achieve the following objectives:

1. To meet the system's objectives.
2. To ensure the financial health of the system.
3. To ensure that parking is affordable for downtown visitors and businesses.
4. To implement the City Council's parking and transportation objectives.

The most important rate is the basic rate for short-term (less than four hours) daytime parking. This rate will be as low as possible to maximize objectives #1 and #3 above. It will be raised as little as possible, and only when needed to meet objectives #2 and #4. Short-term rates will be below market. Only City Council Resolution or Ordinance will adjust short-term rates. (This last statement should reflect local policies. Many programs have an internal board that are authorized to make rate setting decision without council or ordinance approval requirements.)

The City will consider the need for an additional increase in the parking rates as part of the analysis of specific projects to site and build or acquire a new downtown garage. The City will account for the cost of land, cost of construction, financing costs and related issues in determining the need for such an increase.

The rate for long-term parking (greater than four hours) and the all-day maximum will be as high as necessary to ensure the availability of employee parking. Generally, long-term rates will be set at the market rate for the area.

The rate for evening parking will be set to achieve all four objectives. Market rates will be a consideration. This means that we will try to be consistent with the market to maximize revenues, but not if it discourages potential customers from coming downtown for events.

Carpool rates for each garage will be set at 75% of the monthly rate for that garage.

◢ Annual Updates

This section of the Financial Plan describes the system's policies related to "annual updates". See example language below:

Each year the _ (Parking System Brand Name) _ will complete an update of this Plan. This update will:

1. Determine whether or not the system is meeting the Operational Objectives described in this Plan. If not, the update will include a plan to achieve that objective.

2. Determine whether or not the system's coverage ratio meets or exceeds 1.5. If it does not, the update will include a plan to achieve that objective.

3. Determine whether or not the Ending Fund Balance is sufficient to fund the system's operating and maintenance reserves. If it is not, the update will include a plan to achieve that objective.

4. Determine if the Balance is sufficient to pay other debt commitments. If it is not, the update will include a plan to achieve that objective.

5. The Annual Update will assess the need to build additional parking facilities. These could include any project consistent with the Strategic or Facilities Development Plans. If there is such a need, the update will include an estimate of when they will be needed, how much they will cost, and will establish a funding strategy. The strategy will calculate the amount per year that will need to be set aside to fund

the new facilities. For example, if $5,000,000 is needed 5 years from now, $1,000,000 of the remaining net revenues will be placed in the Capital Construction Reserve. This Reserve will be set aside to offset the cost of the new facilities.

7. The update will also assess the need for other parking and traffic improvements that may be funded by the Parking Facilities Fund, as allowed by state law. Any funds in excess of the amount needed for the Capital Construction Reserve will be available for other parking and traffic improvements, as allowed by state law. If the Parking Group determines that these improvements have a priority over the funding of the Capital Construction Reserve, it may make findings to Council to that effect in the Annual Update.

RESOLUTION No.

Approve a Strategic Plan and a Financial Plan for the City owned _ (Parking System Brand Name)_ parking garages.

WHEREAS, the City owned _ (Parking System Brand Name) _ parking garage system has been very successful in recent years in meeting the growing demand for short term parking while at the same time strengthening its financial condition.

WHEREAS, continued demands to increase the supply of parking and to assist with the financing of other transportation objectives strengthen the need for careful financial planning to ensure that the system will continue to successfully meet its objectives.

WHEREAS, the _ (Parking System Brand Name) _, has carefully drafted these Plans to ensure that all system and City objectives are met.

NOW THEREFORE BE IT RESOLVED, that the City Council adopts the attached Strategic Plan and Financial Plan effective immediately, directs that they be used to guide decisions regarding the _ (Parking System Brand Name) _ system, and calls for the Annual Updates to be completed as detailed in the Financial Plan.

Appendix 26

White Paper: Residential Parking Permit Programs

KIMLEY-HORN

Parking Planning White Paper Series

RESIDENTIAL PARKING Permit Programs

Kimley»Horn

Expect More. Experience Better.

RESIDENTIAL PARKING Permit Programs

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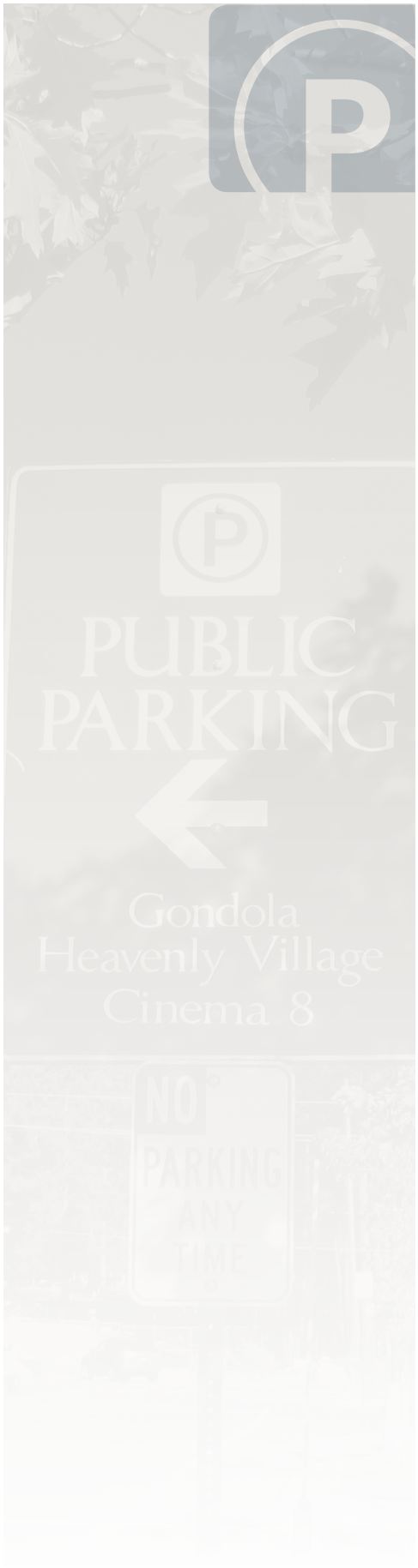


Introduction

This paper will describe Residential Parking Permit Programs (RPPP), including their need and applications, typical requirements for initial designation and implementation, and policies and procedures for identification and enforcement.

Increased local parking and/or the introduction of parking charges in business districts, hospitals, colleges, and universities has increased demand for free parking spaces off-site. Residential areas in close proximity to these parking generators often experience "spillover" parking from non-resident vehicles parking in front of their homes, especially during weekday hours.

Some of the potential parking generators in residential neighborhoods include:

- Commuters into central business districts (CBDs) or other commercial office districts.
- Retail establishment employees and their customers.
- College and university students, faculty, staff, and visitors since most colleges and universities charge a fee to park on campus.
- Public transit riders, for those residential streets near transit routes.
- Hospital staff and visitors, since many hospitals now charge a fee to park.
- Public schools, since most high schools have high numbers of students competing for smaller numbers of parking spaces.

In response to these issues, many municipalities have developed RPPPs to address parking encroachment into residential areas, typically by requiring special resident parking permits be displayed during certain hours while parked on specific streets. Such programs allow parking availability for residents while limiting non-resident parking on residential streets.

The goals of the residential permit program in Fort Collins, CO are described below:

"The Residential Parking Permit Program (RP3) is designed to make Fort Collins neighborhoods safe and pleasant places to live, work, and attend school by reducing on-street parking congestion. The program helps to provide close and convenient on-street parking for residents by reducing the volume and impact of non-resident vehicles in neighborhoods. It protects residential streets by using a system that limits parking in a neighborhood to only those residents and their guests with permits during the posted time limits."

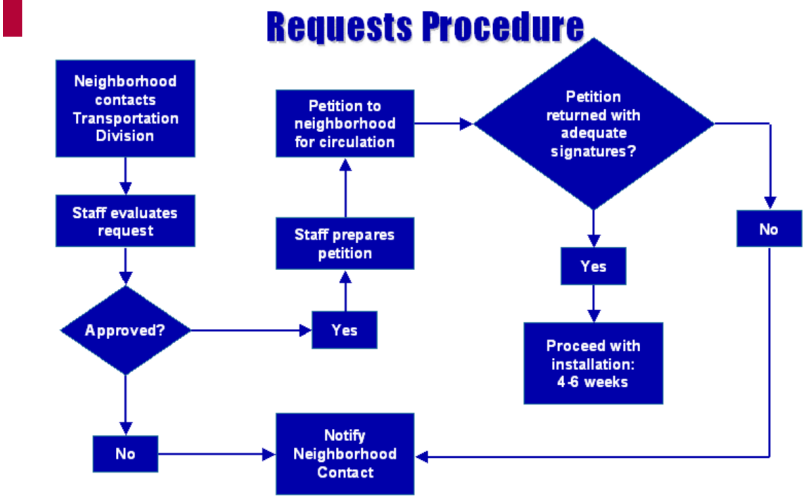
Residential Parking Permit Programs

Requirements/Guidelines for Residential Parking Permit Program Creation

Requirements by cities and counties vary somewhat, but most RPPPs require the following guidelines be met:

- Citizen participation is essential to the development of an effective RPPP.
  - The residents/neighborhood association must petition the local governing body to request implementation of an RPPP.
  - Governments normally require a certain percentage of residents to sign the petition to ensure there is popular support for the change.
  - The resident percentage necessary for signing the petition can range from 50% to 80%.
- The total number of street(s) affected must be identified.
- Governing bodies may restrict the petitioners on a street-by-street, block-by-block, subdivision, or other basis.
  - The block(s) surrounding the street(s) on which the RPPP is requested must be zoned residential.
  - The governing body should conduct a parking survey to verify one or more of the following:
    - At least "X"% (e.g., 33%) of vehicles parked on the affected street are registered to non-residents. This information can be verified by vehicle license/registration checks.
    - At least "X"% (e.g., 33%) are parked a minimum continuous number of hours (i.e., four hours or more). A vehicle inventory and turnover analysis can verify this information.
    - At least "X"% (e.g., 33%) are parked at least nine months out of the year (designed to include public school/college/university parkers).
    - A similar parking demand occurs on at least "X" number (e.g., five) contiguous blocks.
    - The residents petitioning the local government are willing to pay for the initial cost and installation of parking signs required to enforce the RPPP regulations. This requirement is not very common, however. When the cost of the program signage must be passed on to the residents, it is usually through residential parking permit fees.

The flow chart below depicts a typical approval process for a municipal RPPP.



Once the above requirements have been met, the municipality may approve the request for implementation of a RPPP.

Typical Process for Implementing a Neighborhood Parking Permit Program

The City

- Conducts a parking survey and gathers information to assess the need for a Neighborhood Parking Permit (NPP) zone.
- Develops a draft proposal (including zone boundaries, the type of zone, recommended parking restrictions, permits available, and other details). A neighborhood meeting may be held to assist in developing the proposal and receive public input.
- Modifies the original proposal if necessary.
- Holds a public hearing before the Transportation Advisory Board to review the proposal.
- Forwards Board recommendation and public hearing comments to the City Manager for review.
- The City Manager makes the final decision regarding the zone and informs the City Council.

RPPP Policies, Options, and Restrictions

RPPP permits are issued to residents by the municipality in order to restrict parking within the RPPP zone. Below are some typical permit issuance policies:

- Residents are issued a limited number of permits per household. The permit price can vary from no charge to $50 per permit per year or more.
- The number of permits issued can vary based on resident demand and lot frontage size/parking area within the permit zone.
- The price for the permits is normally based on whether or not the municipality wishes to recoup the cost of the program (signage, permits, and/or enforcement) from the residents.
- Short-term visitors are often accommodated by allowing for up to two hours of free parking without a permit.
- Longer-term visitors can be accommodated in several ways:
  - Some cities offer one visitor permit per household, either at no charge or at the prevailing rate.
  - Some cities offer visitor permits for up to 30 days at a time, normally at no charge.
  - Cities usually restrict the number of times a visitor permit will be issued to the same vehicle (i.e., once per year).
  - Some cities offer work permits for contractors or repair people needing parking for longer than the typical two-hour limit.

Permit Fees

The residential permit programs in general all have quite low fees, from free to $20 for the year. Many state laws regulate how much a municipality can charge for residential permits, limiting the price of the permit to a statutorily defined amount or the cost of issuing the permit. Many communities have found it politically undesirable to attempt to limit demand for parking in residential neighborhoods by increasing the price for existing residents.

In some cities, permit fees can run as high as $60 per year (San Francisco) or over $100 per year (Toronto, Canada). Some places structure fees so that second and third permits for a household are more expensive. For example, in Alexandria, Virginia, residential parking permits cost $15 for the first vehicle, $20 for the second vehicle, and $50 for each additional vehicle. This discourages households from parking multiple cars on the street.

RPPP Enforcement

The basis for any effective enforcement program is adequate signage restricting parking within the RPPP zone. Signage must indicate the type of permit required (i.e., zone-specific), the hours of enforcement, and the parking time limit (if applicable).

Enforcement hours are normally 8:00 a.m. to 6:00 p.m. weekdays, depending on the nearby parking demand generator and enforcement capabilities. RPPP applicants must prove residency, such as by drivers license, vehicle registration, and utility bills, in order to obtain permits.

Most cities require payment in full of any outstanding parking tickets issued to permit applicants before any RPPP permits are issued/sold.

Enforcement should be aware that it is not uncommon for residents to sell their permits to non-residents, sometimes for a large profit. This is especially true in neighborhoods near a college or university.

RPPP FAQs

A best practice when introducing a new RPPP is to provide a well-developed and easy to understand "Frequently Asked Questions" or FAQ Brochure. Questions typically addressed in an FAQ might include:

- What is the process for initiating a residential parking permit area?
- Who initiates the process to designate a permit area?
- Who is eligible for a residential parking permit?
- What areas are eligible to apply for a residential parking permit area?
- What qualifies a neighborhood to be eligible for RPPP?
- How do I obtain parking permit(s) for my vehicle(s)?
- Does the parking permit allow me to park my vehicle anywhere?
- Is my parking permit valid in other parking permit zones in the City?
- How long is a Residential Parking Permit Valid?
- Is there a charge for the parking permit?
- I own a residence located in a parking permit zone but do not live there. I lease the property to others. Can I obtain a parking permit?
- What is a guest permit?
- Is there a fee for a guest permit?
- Do I have to obtain the permit(s) for my guest or can my guest apply for the permit(s)?
- What information must I present to obtain my parking permit or a permit for my guest's vehicles?
- Can I get a permit for someone who is doing work at my residence?
- My business is in one of the parking permit zones. Can my employees and I obtain parking permits for our vehicle(s)?
- How is the parking permit program enforced?
- Is there a grace period from the date when my permit expires?
- What happens if permits are obtained or used illegally?
- How do I get permits for my block?
- How does a resident obtain an application form?
- Who must sign the petition?

- Where does a resident submit the application and petition form?
- Once the application and petition are submitted, what are the next steps in designating a permit area?
- Are holidays or special events exempt from these restrictions?
- Do the restrictions affect delivery, service, or emergency vehicles?
- Who can purchase permits?
- What happens once the area is designated?
- Which City departments are involved in the Residential Permit Parking Program?

RPPP Permit Display Instructions

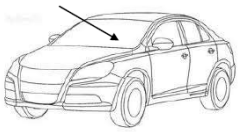
To improve compliance and reduce citations related to improper display of permits, some communities provide specific permit display instructions (see example from Madison, WI below).

ATTACH PERMIT IN LOWER LEFT HAND CORNER OF THE WINDSHIELD (DRIVER'S SIDE).

The Madison Police Department may issue a ticket if the permit is improperly displayed or unreadable, there is more than one permit displayed, or if the license plate or vehicle type do not match the permit information in the City's permit database.

If you need a replacement permit for any reason during the permit year (new vehicle or plate, move, broken windshield, etc), **you must remove the sticker and apply for a replacement. Replacement permits will not be issued without the original permit returned.**

Place Permit Here



All vehicles except motorcycles

Place permit on fork

Motorcycles

Contact the City Parking Utility with questions about the residential parking program at parking@cityofmadison.com or (608) 266-4761. The office is located at 215 Martin Luther King Jr. Boulevard, Suite 100, and is open Monday through Friday from 7:30 a.m. and 4:30 p.m.

RPPP Conclusions

RPPPs can be an excellent tool to ensure adequate parking for residents on streets in front of their homes and to encourage non-resident parkers to park in more appropriate areas.

While protecting parking spaces for residents is typically the primary purpose of an RPPP, communities experiencing severe parking shortages or featuring residential areas blended with commercial areas can be differently motivated. These conditions are not uncommon in transit oriented developments where on-street parking is allowed to apply toward residential parking requirements. In these situations, maximizing the use and turnover of public on-street parking during business hours and ensuring availability of parking for residents after business hours can be dual program goals.

An often overlooked aspect of RPPPs is that they can generate additional parking revenue for the demand generators in an area by eliminating nearby free parking options (assuming paid parking is in place within the area).

RPPPs are sometimes seen as a bureaucratic headache requiring residents and their guests to obtain permission to park in front of their own homes, while prohibiting other citizens from parking on public streets. Once a petition process has been initiated by area residents and a parking survey has been completed, assuming the utilization data indicates the need for such a program, the decision to implement an RPPP should consider these other factors.

Sample Documents

A variety of sample RPPP documents from several U.S. cities is provided on the following pages. These samples illustrate the type of information typically provided by a municipality to explain the program's goals and processes.

Resident Information/Application

Sharing the Streets

In 1996 the City of Boulder adopted a new Transportation Master Plan (TMP) with the support of its citizens. One item addressed was the need to manage parking and balance transportation demands while preserving the quality of life in Boulder.

In this effort, the City developed a number of options, among them the use of residential permit parking system. Residential permit parking programs have been used successfully in cities nationwide and are most often implemented in neighborhoods adjacent to major employment and activity centers.

Preserving the Character of Our Neighborhoods

The Neighborhood Permit Parking Program (NPP) is designed to make Boulder neighborhoods safe and pleasant places to live, work and attend school by encouraging less driving and reducing on-street parking congestion. Each neighborhood in the program has public parking limits that are unique to that area and take into account the neighborhood's particular needs.

PARKING SERVICES P City of Boulder

RESIDENT
NEIGHBORHOOD PERMIT PARKING (NPP)

INFORMATION & APPLICATION

Downtown University Hill Management Division
and Parking Services
1500 Pearl Street, Suite 302 • Boulder, CO 80302
Phone: (303) 413-7300 • Fax: (303) 413-7301
www.ci.boulder.co.us/duhmd

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RESIDENT NPP APPLICATION

PLEASE PRINT ___ Owner ___ Tenant

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: (H)_____ (B) _____

Fax: _____ (optional)

Email: _____ (optional)

Under the Boulder Revised Code, 1981, a vehicle with a valid, properly affixed residential permit will be exempt from the NPP zone time limit restrictions where there is a Permit Excepted sign in the zone where the permit was issued. I understand that the permit does not exempt the permitted vehicle from all other parking restrictions or laws, or from restrictions posted on other NPP zones.

I will affix the permit issued to me to the interior lower left-hand corner of the windshield in the vehicle for which it is issued. I will remove the decal (permit) if the vehicle is sold or transferred to another. Should the decal (or pass) be lost, I will report it to Parking Services within three (3) business days.

I will retain possession of the visitor pass(es) issued to me. Visitor passes can only be used for 24 consecutive hours while the visitor is on the premises of the address the permits were issued. Abuse of any permit issued by the City of Boulder can result in the revocation of **Resident** permits for up to one year.

_____ _____
Applicant Signature Date

FOR OFFICE USE ONLY

Issued by: _____ Date:_____ NPP Zone:_____

Proof of residency: ☐ Proof of vehicle registration: ☐

License Plate _____ Vin._____ Exp. Mo/Yr:____

License Plate _____ Vin._____ Exp. Mo/Yr:____

Vehicle 1 Decal #_____ Vehicle 2 Decal #_____

Vehicle 3 Decal #_____ Vehicle 4 Decal #_____

Visitor permit #1 _____ Visitor permit #2 _____

Resident NPP Information

FEES AND PAYMENT METHODS
- $12 per vehicle per year.
- Accepted payment methods include: cash, check, Visa and MasterCard.

ELIGIBILITY (Who can get a NPP?)
- Residents living in an NPP zone
- Businesses located in an NPP zone.
- Nonresident commuters (limited availability).

REQUIREMENTS
- Complete the attached NPP Application.
- Application requirements include:
  - **Proof of residency** (current lease, recent utility bill, or vehicle registration).
  - **Current Vehicle Registration** in your name. If your last name is not on the registration, you must provide a statement from the owner verifying you as the primary driver. The statement must include the owner's name, address, telephone number and signature.

RESTRICTIONS
- Vehicles without parking permits may park in an NPP zone up to the posted time restriction one time per day. After parking in a zone for the posted time limit, vehicles must leave the zone and may NOT park in that zone again on the same day.
- Vehicles with NPP permits are exempt from posted NPP parking restrictions.

PERMITS PER UNIT
- Mapleton, High /Sunset 3 unrelated people per unit.
- Columbine, Fairview, Goss Grove, University Hill & Whittier: 4 unrelated people per unit.

Resident NPP Information

VISITOR AND GUEST PASSES
- Two non-replaceable visitor passes are available per unit with purchase of a permit.
- Use of the visitor pass is valid only while the visitor is on the residential premises.
- Visitor passes shall not exceed 24 consecutive hours and are to be used within a one-block radius of the residence address.
- Guest passes are available on an as-needed basis for a specified time period.

PERMIT DISPLAY
- Affix the resident permit to the interior lower left-hand corner of the windshield.
- Remove the permit if vehicle is sold or transferred.
- Visitor and Guest Passes are hangtags and must be hung from the rearview mirror with the zone name facing out while the vehicle is in the zone. For safety, please remove when driving.

LOST PERMITS
- Report lost permits or passes to Parking Services within three business days.

NPP ZONES & PUBLIC PARKING TIME LIMITS

Columbine	9am – 5pm Mon - Fri	2 hour limit
Fairview	8am – 3pm School Days	2 hour limit
Goss Grove	8am – 6pm Mon - Fri	2 hour limit
High / Sunset	8am – 6pm Mon - Fri	2 hour limit
Mapleton	8am – 6pm Mon - Fri	3 hour limit
University Hill	8am – 5pm Mon - Fri	2 hour limit
Whittier	8am – 8pm Mon - Fri	3 hour limit
Whittier Night	8pm – 12am Fri & Sat	3 hour limit

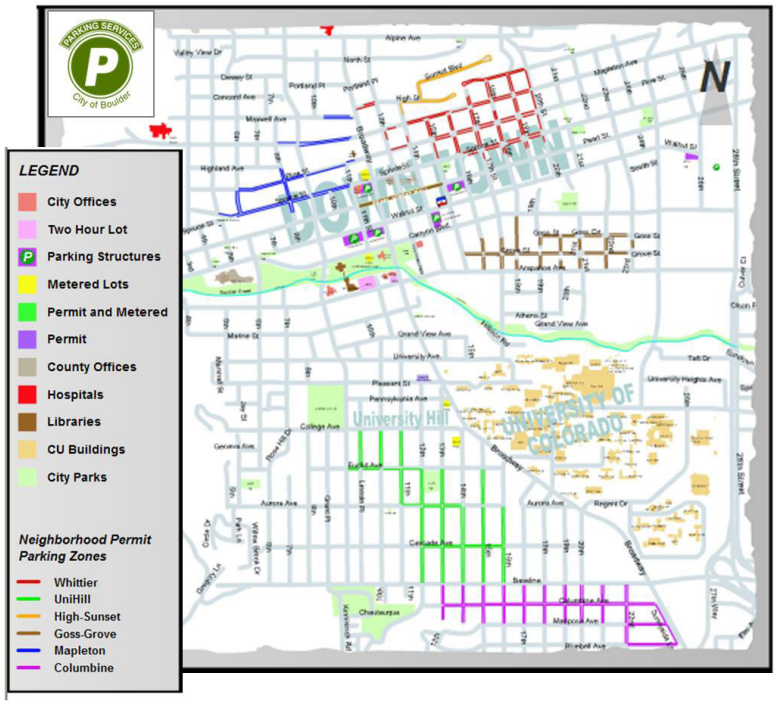
NPP RENEWAL DATES

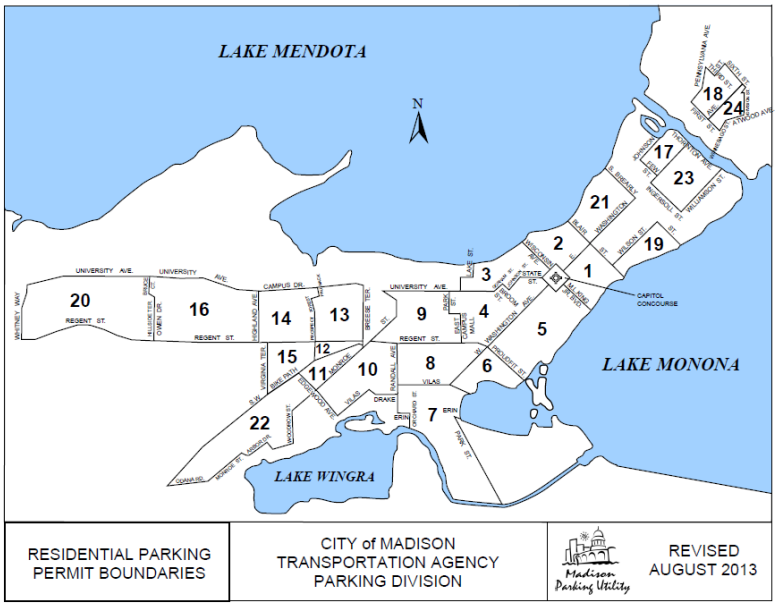
Columbine & Goss Grove	August 31st
University Hill	September 30th
High / Sunset & Whittier	October 31st
Fairview & Mapleton	November 30th

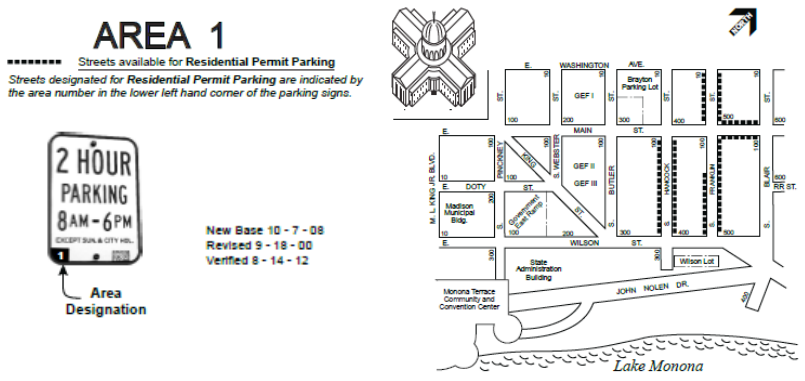
More Information: Downtown University Hill Management Division and Parking Services
1500 Pearl Street, Suite 302 • Boulder, CO 80302
Phone: (303) 413-7300 • Fax: (303) 413-7301 www.ci.boulder.co.us/duhmd

9/10/2004

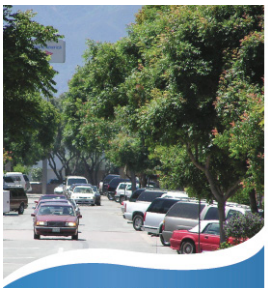
NPPP Area Map







NPPP Brochure



RESIDENTIAL PARKING in Fort Collins

The Residential Parking Permit Program (RP3) is designed to make Fort Collins neighborhoods safe and pleasant places to live, work and attend school by reducing on-street parking congestion.

The program helps to provide close and convenient on-street parking for residents by reducing the volume and impact of non-resident vehicles in neighborhoods. It protects residential streets by using a system that limits parking in a neighborhood to only those residents and their guests with permits during the posted time limits. Each neighborhood in the program has its own unique parking requirements, and solutions are tailored to each area to take into account the neighborhoods' particular needs.

City of Fort Collins
Parking Services
215 North Mason Street
PO Box 580
Fort Collins, CO 80522-0580

City of Fort Collins
Residential
PARKING PERMIT
Program

City of Fort Collins Parking Services

fcgov.com/parking/residential
970.221.6617

SETTING UP RESIDENTIAL PERMIT PARKING in your Neighborhood

The Residential Parking Permit Program (RP3) is voluntary and is only established in neighborhoods where residents request the program and there is a measurable parking problem:

- Resident contacts Parking Services about their neighborhood parking problem.
  - Call: 970-416-2036
  - Email: jmoyer@fcgov.com
- City Staff verifies that a parking problem exists by monitoring the neighborhood.
- City Staff defines boundaries and other characteristics of the program for the neighborhood.
- The City contacts residents to give them the opportunity for input and to determine if the program will work in their neighborhood.
- If more than 50% of responding residents are in favor of the program then the implementation process will begin.

City of Fort Collins Parking Services

How the **RP3** works

- Residents who live in a designated permit district may obtain one free permit and may purchase additional permits.
- To obtain your parking permit:

Come to Parking Services located at 215 N. Mason

Bring with you:

- Valid vehicle registration
- Current driver's license
- One of the following proofs of residency bearing your name and address within the permit zone:
  - Gas, Electric or Telephone Bill
  - Cable Television Bill
  - Monthly Bank Statement
  - Credit Card Bill
  - Water and Sewer Bill
  - Notarized/signed Rental Agreement

**Note: If your vehicle registration or driver's license contains your name and address within the permit zone then you do not need to provide another form of residency.*

Guest Permits

- Residents in a permit parking zone may also obtain short-term guest passes for visitors.
- To obtain a permit for your guest you must supply the following:

License plate number

State of issue

Vehicle make

Color

Body style
- Sedan
- Pickup
- Motorcycle,etc.

FOR MORE INFO:
In person: 215 N. Mason
Call: 970-221-6617
Email: jmoyer@fcgov.com
fcgov.com/parking/residential

NPPP Required Documentation Checklist

City of SACRAMENTO

APPLY FOR A RESIDENTIAL PERMIT

Use the chart and definitions below to determine the Residential Permit type that you may qualify for. Then click on that permit type to apply. Instructions are on the application.

DMV Registration: A valid DMV registration reflecting resident's name and the address where the residential permit will be registered to. Local post office box is acceptable only with proper proof of permit address reflected on registration.

Proof of Residency: Current (last 45 days) utility bill, phone bill, cable bill, bank statement or insurance declaration page. Local post office box is acceptable with proper proof of address reflected on the bill or statement.

*Chart below reflects eligibility in general. Each application is still subject to review for correct documentation and limits to the number of permits per household.

Documentation you have...	Permit Type*		
	VEHICLE	VISITOR	TEMPORARY
Valid DMV Registration and Proof of Residency	•	•	
Valid DMV only. No Proof of Residency			•
Proof of Residency only. No DMV Registration		•	•
Military Personnel with Proof of Residency	•	•	
Property Owners with Current Property Tax Statement		•	
Business Owners with DMV Registration and Proof of Residency for business address	•		
Proof of Residency only. Accommodating Short-Term Visitors (Guests, Contractors, etc.)			•
Proof of Residency with new vehicle. Waiting for DMV Registration		•	•
New Resident. No DMV Registration or Proof of Residency			•

Special Permit Needs	VEHICLE	VISITOR	TEMPORARY	
Leased or Company Vehicles	•			Company Vehicle Form Required
Student (college or university) with Proof of Residency only. No DMV Registration.			•	Subject to Student Temporary Permit Requirements
Home Health Care Providers			•	Please call 916-808-5117

Permit Type	Description and Required Documents	Limit	Special Requirements
Student Temporary	Available to residents who are students currently enrolled in a local college or university and who may not have DMV registered to their residence. Students must apply in-person at the Revenue Division and must have all required documentation ready upon application. • Student ID • Current Semester or Quarter Course • DMV Registration • Proof of Residency (i.e. SMUD, PG&E, bank statement) • Temporary Permit Application	One per student	Must be renewed on a semester basis
Home Health Care	Residents who require a health care provider to visit their residence may be eligible to obtain a Home Health Care Permit. These permits and their expiration dates are determined on a case-by-case basis. These permits are placards which are not license-plate specific. The permit must be displayed on the inside of the vehicle on the driver's side of the dashboard. The VIN number of the vehicle must still be visible when placing the placard on the dashboard. For a list of required documentation, please click on the link below.	Case-by-case basis	To apply please call 916-808-5117
Leased or Company Vehicles	• Current DMV registration • Proof of Residency: Current utility bill (last 45 days) reflecting business name and address where the permit will be registered to. • Declaration of possession of a leased or company-owned vehicle either on company letterhead or on a completed Company Vehicle Verification Form.	Vehicle Permit	

Appendix 27

Sample Meter Bagging Policies

Appendix 28

Sample Meter Bagging Policies

Example # 1

City of New Haven, CT

General Commercial Use and Construction

5 days minimum notice is required to guarantee a reservation.

Purpose:

- Use of meter bags is a privilege extended to allow providers of commercial services to park vehicles necessary to the performance of the service, on an intermittent and temporary basis, near to the work site where off-street parking is not available or inadequate.

Meter Bag Usage Regulations

- Vehicles parked at meter bags are permitted only as required to perform a service. Meter bags shall not be used for general employee or convenience parking, and shall not be used by street vendors.
- Meter bags are not permitted in retail areas, specifically Chapel Street, York Street, Broadway, Whitney Avenue, Orange Street, Church Street, and any other street specified. The need for bags on those streets must be demonstrated at the time of application in order to obtain permission to park on those streets. Vehicle using meter bags contrary to the regulation will be ticketed as if the bag were not present.
- Meter bags may be recalled at any time for the convenience of the city. From time to time, the Department may call to ask you to move your bag to another location for any reason. Meter bags may not be used at spaces posted for a 15 or 30-minute limit.
- Meter bags are valid only during those times parking is permitted at the meter space where used. (Check Signs) If City meter space is posted TOW ZONE, NO STANDING 7am - 9am and/or 4pm - 6pm, parking at the bag is prohibited and the vehicle may be ticketed and towed.
- Parking is also prohibited during street sweeping, parades; 2AM-6PM alternate side ban, snow emergencies, festivals, and the like. Watch the postings.
- Parking meters must be covered the evening prior to use to reserve the space for the next day. The law requires the Department to give violators 12-hr minimum notice before removing them from your space.
- Unauthorized vehicles will be removed from your space upon complaint by you to our tow desk at 946-8076.
    - You will be required to certify to us that the bag has been on the meter at least 12 hours before your complaint.

- If a vehicle is caused by you to be towed unjustly, you will be required to pay the owner's tow fees, and may be barred from future meter bag use.

City of New Haven, CT (Continued)

- Meter bags reserve spaces during meter operations, generally 7AM -7PM. We do not tow people from bags who park after 7PM.
- If your construction work requires clear curb space 24 hours per day, consult with Traffic about this so other solutions can be arranged.

Meter Bag Pick Up

- Meter bags are available for pickup at the Traffic Department only on the business day before after 2 pm (Friday for Saturday or Monday use), and are chargeable from the day after pickup to the day before return by 11am (one day minimum).
- Later returns are charged as being in use.
- Stolen bags must be reported promptly.
- Applicant will remain responsible for daily payment for stolen bags until reported.
- Once reported stolen, a bag will be recovered by the Department when seen, and any vehicle parked at that bag will automatically be towed.

Meter Bag Fees

The meter bag fee is $17.00 per day and will be billed on the basis of a six (6) day week (Sunday and Holidays are excluded).

- A deposit of $50.00 per bag is required in advance. This deposit shall be forfeited if the bag is not returned for any reason, or if the bag is destroyed.
- A $50.00 fee will be charged for lost or damaged bags and a $15.00 fee will be charged for lost or damaged locks.
- A $10.00 fee is charged for lost or broken keys.
- The Department may bar you from future meter bag use for failure to pay fees when demanded.
- You also will not be issued Public Works permits while in arrears.

Special Events

In circumstances where special one-time events (weddings, funerals, public events and festivals) may cause a traffic hazard due to lack of parking, loading or drop-off pick up spaces, the Department will make 3 bags available.

- Reservation of parking spaces for attendees at these events can only be accommodated where space exists without placing undue burden on surrounding users.
- You must still follow all directives stated above.
- For special events, the applicant must demonstrate a need for on-street loading and / or pick up and drop off space.
    - Reservation of parking spaces for attendees at these events is not encouraged and will only be accommodated where space exists without placing undue burden on surrounding users.
    - In the event additional off-street parking is required, the applicant is encouraged to contact the New Haven Parking Authority for reservation of spaces off street.
- **The Director's approval is required if more than 3 bags are required**. The standard $17.00 fee will be charged for each day of use.

- In the event of a funeral or not-for-profit special event, the department may waive the meter bag fee.

City of New Haven, CT (Continued)

FEES

New Haven, CT
Permit, License and User Fees

Departments & Items	Fee
Traffic & Parking	
• Traffic maintenance record, fee for records search and preparation of report	$75.00
• Traffic signal chart, fee for preparation of	When available included above
• Traffic signal layout, fee for preparation of	When available included above
Residential Parking	
• Each permanent decal to a maximum of 2	$20.00
• Each visitor's Decal	
*Ten 1-day visitor passes provided to each permit holder	
• Additional books of 10 visitor passes available for $10	
• Each issuance of special event permits	$1.00
"No Parking" Posting Fees	
• One side of street, 1st 100 feet	$30.00
• Each additional 100 feet	$5.00
• Two sides of street, 1st 100 feet	$35.00
• Each additional 100 feet	$10.00
Banners	

• Per banner, suspended across street, per event (up to 2 weeks)	$500.00

City of New Haven, CT (Continued)

• Per Banner, suspended across street, per event Extension (up 2 weeks)	$500.00
• Per ten (10) pole banners (pennants) for 2 weeks	$500.00
• Late fee for banners that are delivered later than 7 days prior to the installation date	$100.00
Meter Bags	$17.00 per day

- A deposit of $50.00 per bag is required in advance. A $50.00 fee will be charged for lost or damaged bags and a $15.00 fee will be charged for lost or damaged locks. A $10.00 fee is charged for lost or broken keys.

Example # 2

City/County of Denver, CO

Parking Meter Bagging

Note: Meter bagging requests take up to 5 business days to process and so should be submitted at least 1 week before your event.

Meters may be bagged with "No Parking" bags over the meter heads to keep the street clear of parked cars for construction, special events and filming. Please note, a street occupancy permit must also be obtained for any event that takes place in the street/sidewalks/public right of way. All parking permit requirements and applications are available at Permit Operations

See documents on the following pages:

City/County of Denver, CO (Continued)

City and County of Denver

DENVER PUBLIC WORKS

Department of Public Works
Engineering Division

Permit Operations
2000 W. 3rd Ave, Denver, CO
Phone 303-446-3758
www.denvergov.org/PWPO

Parking Meter Request

Applications must be e-mailed to pwpermits@denvergov.org.
Submittals must include Credit Card Authorization Form.

$25 Per Meter Parking Space Per Day – Premium Areas as defined in the City Charter (Downtown and Cherry Creek).
$15 Per Meter Parking Space Per Day – All other areas.

All fields are required. Please allow 48 hours to process permit.

Reason for Meter Request: _____

Street Occupancy Permit Number (if applicable): _____

Name/Business: _____ Phone #: _____

Address: _____ Mobile #: _____

Requestor's Name: _____ Email Address: _____

The specific requirements, fees, and conditions for meter bagging may be found on-line at: PWPO website.

A re-application fee of 50% of the total fee (up to a maximum of $100) will be issued if a permitee needs to modify an existing permit.

Reserved meters are available daily from 10:00 am through midnight. Meters are not bagged on holidays or Sundays.

Start date for request: _____ End date for request: _____

Start time for request: _____ ☐AM ☐PM End time for request: _____ ☐AM ☐PM

Select Bag Type:

- ☐ Yellow Bag (Specific Vehicles only)
- ☐ Red Bag (No Parking – TOW Away Zone)
- ☐ Meter Head Removal

Select Purpose:

- ☐ Bus
- ☐ Construction (Provide Occupancy Permit #)
- ☐ Food Truck
- ☐ Non-Profit (Attach 501(c)3)
- ☐ Reserved Parking

Meter Numbers: _____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____ _____

_____ _____ _____ _____ _____ _____ _____

Alternate Meter Numbers: *(If the above meters are not available.)*

_____ _____ _____ _____ _____ _____ _____

If request exceeds the meter space provided, please attach a separate work sheet listing all meters requested.

PRT: _____ Date: _____ Permit # _____

City/County of Denver, CO (Continued)

CITY AND COUNTY OF DENVER

DEPARTMENT OF PUBLIC WORKS
Development Engineering Services

Public Works Permit Operations
2000 W. 3rd Avenue, Room 107
Denver, Colorado 80223-1027
Phone: (303) 446-3759
Fax: (303) 446-3755
www.denvergov.org/propermits

Parking Meters and Kiosk Entrance Requirements

Authority:	Revised Municipal Code Chapter 54, Section 517 and Public Works Rules & Regulations, Issuance of Permits by the City Traffic Engineer
Purpose of Ordinance:	To reserve metered parking areas for construction purposes, special events, etc.
Document Date:	August 26, 2010
Permit Types:	Parking Meter Covering Permit / Street Occupancy Permit (Kiosk)
Permit Dates:	Dates are specified by the Customer/Permittee.
Customer Interface:	*Most* communication between the City and the customer will be done through Public Works Permit Operations.
Affiliated Departments & Agencies, and Roles:	Right-of-Way Enforcement Meter Shop provides services to cover and uncover meters.
Application Process:	Customers must complete the *Special Event, Film & Parking Meter Request* Form completely to provide all of the following information. 1. Meter numbers (located on back of meter head) 2. Bag color (Red, Yellow). *Red bags are dedicated to areas where **ALL** parking including unloading/ loading will be prohibited. Yellow bags are restricted to the Permittee specified.* 3. Reason for the request (examples: Bus parking, vendor parking, etc.) 4. Specific dates and times meters will be utilized by permittee. 5. What they want the bag legends to read (additional comments on meter request form). Approved charitable organization events may be eligible for discounted meters. Submit a completed *Special Event, Film & Parking Meter Request* accompanied with a letter from the requesting Approved Charitable Organization. The letter must include: 6. Organization name 7. Organization / Applicant contact name and number 8. Statement that the meters are being bagged for the Charitable Organization's event ONLY. 9. Attach a copy of your 501(c)3 Certificate. Full fees will be charged if not included.
Consideration:	• **No permit will be issued unless accompanied by payment or credit card authorization.** • Discounted meters require 72 hours for approval by PWPO. Customer must complete the *Special Event, Film & Parking Meter Request* & submit the required documentation listed above for EACH request. • Each meter request will need to have preferred meters and alternative meters shown on the meter bag application. This is needed in the event there is a conflict on your first choice of meters. Upon receipt of the required application documentation, PWPO will check to see if the meters are available. If available, PWPO will process the application and issue permits. • Staff will make every effort to accommodate an extension to an existing permit. Prior to granting the extension, Staff will insure that any conflicts as a result of a new permit or street occupancy permit of existing meter(s) does not exist prior to creating a new permit that extends an existing permit • For applications requiring a Street Occupancy Permit to accompany a Meter Permit, please allow an additional 5 business days for an Engineer Review. • Requests for meter bagging for use prior to 10:00 a.m. must be bagged in the p.m. of the previous business day. • If bagging is requested for early morning and cannot be accomplished the night before, early morning bagging (before 10:00 a.m.) can still be accomplished, but will be subject to an extra fee of $55.00 per hour, with a 2 hour minimum. • Saturday bagging requests will be charged an overtime fee of $55.00 per hour, with a 4 hour minimum. • **Same day service is highly discouraged.** At the minimum, allow one (1) business day for permitting and bagging services or services cannot be guaranteed. • For same day requests there needs to be a 4 hour window before the time of the request in order to ensure it can be completed. Meter requests made less than 4 hours before the start time will need approval from Right of Way Enforcement and can not be guaranteed.

City/County of Denver, CO (Continued)

Fees:	• Fees are determined by meter / kiosk location times the number of days. • The fees for meters in the CBD and CCBD are $25.00 per meter per day and outside of the CBD and CCBD is charged $15.00 per meter per day. Where **Kiosks** are used in place of a parking meter, the permittee will be charged $25.00 per day per 20' of parking lane in CBD and CCBD meter area and $15.00 per day per 20' of parking lane in all other areas. The permittee must place "no parking" signs 24 hours prior to occupancy. • Approved Charitable Organization Events are subject to a $10.00 per meter processing fee and a $10.00 processing fee at kiosks. • *For customer requesting bagging outside normal time frames, there is a minimum charge of $220.00, based on a 4 hour time requirement.* • Some meters will not be charged for Sundays. There will be no charge for any meters on City Holidays. For questions please call PWPO at 303-446-3759. • A re-application fee of 50% of the total fee up to a maximum of $100.00 will be added to the original permit fee to modify an existing permit. This includes but is not limited to change of dates and/or change in meter numbers. Change requests must be submitted 4 hours in advance in order to ensure it can be completed.

Example # 3

City of Houston, TX

Meter Bagging Permits

A meter bagging permit reserves a metered parking space for construction, special events, moving, etc. If a construction project has a lane closure permit and their project is blocking access to a parking meter, a meter bagging permit must also be obtained.

A 48-hour notice is required for meter bagging requests.

Please complete and fax the application to (832) 393-8646 or mail to Parking Management, 2020 McKinney, Houston, TX, 77003.

- Meter Bagging Permit Application (.pdf) *(updated 04.10.2014)*

See form on the following page.

City of Houston, TX (Continued)

Parking Management Division
Administration & Regulatory Affairs Department
2020 McKinney, Houston, Texas 77003
832.393.8690 - Office
832-393-8646 - Fax
parking@houstontx.gov
Monday - Friday 8am – 5pm

METER BAGGING PERMIT APPLICATION

Use this form to apply for all meter bagging permits. Your completed application may be mailed, faxed or submitted in person to the Parking Management Division. Include payment by check or credit card with your application. **Persons wishing to park or close a lane due to construction during non-metered hours must contact PWE Traffic & Transportation Permits at 832-395-3020. All delinquent parking citations must be resolved prior to permit approval. Permits must be paid in full prior to meter being bagged.** Submit your request at least 5 business days prior to service.

Name: _____ Tel (office): _____ Cell _____
Company Name: _____ Fax Number: _____
Address: _____ Zip: _____
E-mail: _____ Reason for Bagging Permit: _____
_____

REQUESTED PERMIT

Start Date: _____ End Date: _____
List the meter numbers that you would like to rent:
Meter #: _____ Meter #: _____ Meter #: _____
Meter #: _____ Meter #: _____ Meter #: _____
Street: _____ Block: _____
Street: _____ Block: _____

**Permits over $50 will be assessed a $26.42 Administration Fee*
***Permit requests not submitted within 2 business days of requested service date will be subject to a $100.00 Expedite Fee*

	Fee	# of spaces	# of days	Total
Meter Bagging Permit *(per space, per day)*	$16.05			
			*$26.42 Administration Fee	
			**$100.00 Expedite Fee	
			Total Fee	

I certify under penalty of perjury that the above information is true.

SIGNATURE OF APPLICANT: _____ DATE: _____

Payment Method:
Cash ☐ Check ☐ Money Order ☐ VISA ☐ Mastercard ☐ Discover ☐
Credit Card# _____ Exp. Date: _____
Name on credit card: _____

Form Letters1
Last Saved:11/3/2014 3:25 PM

Example # 4

City of Sacramento, CA

Meter & Parking Space Reservation Requirements

To make a reservation, please fill out the Meter & Parking Space Reservation Application. The "meter number" is the "PKGS" number series found on the meter decal or display. Please refer to these "PKGS" numbers to reserve each meter. A Parking Space Map may be submitted as an application supplement to assist in describing the reservation location. All changes to applications must be submitted via an online Reservation Change Order Application.

RULES

1. FEES: Posting and daily fees apply.
2. EXPEDITE FEE: Requests must be received a minimum of **10 business days** prior to the effective date. Effective July 19, 2010 any application for meter reservations submitted less than 10 business days prior to the event start date will be subject to an expedited fee of $175.00 pursuant to City Council Resolution 2010-265.
3. RESERVATION APPLICATION:

    a) Reserved on-street parking is for contractors, **commercially licensed** trucks and approved special event vehicles and personal use is not allowed. Reservation for metered and unmetered areas must be requested via an online Reservation Application.
    b) Reserving meters does **NOT** exempt you from obeying posted regulatory signs. It is prohibited by City Code to post unauthorized signage or relocate signage from the approved reservation location.
    c) Only one application per event date & times is allowed. Requests with non-continuous dates and/or in various locations require separate applications and payments. *Example: Requests for June 5th-15th and then for June 25-30th cannot be submitted on the same application.*
    d) Reservation requests that include event valet service must obtain a Valet Permit.
    e) Submission of a Reservation Application is acknowledgement of a request for service to be performed and does not automatically guarantee the spaces. All applications must be approved by Parking Services prior to the event start date.
    f) All Reservation Requirement rules apply.

City of Sacramento, CA (Continued)

4. CHANGE ORDERS:

a) "Change orders" are any changes to the original order, including extensions. Such requests must be submitted via an online Reservation Change Order Application. A Reservation Change order will not be processed without prior submission of a Reservation Application.
b) Change order applications submitted less than 10 business days prior to the event start date will incur an expedite fee, in addition to any other metered and un-metered area fees associated with the changes requested.
c) Change orders should be submitted for:

- Additional or Reduction of meters or color zones over the number reflected in the original order
- Exchanging a meter or color zone for another meter or color zone in the same area
- Extension of dates or times, additional dates that are not in continuous succession of the dates in application or changes in dates and times requested
- Any large vehicle or equipment remaining in the reservation area after the end date has concluded, will be processed as a Change Order and will continue to accrue parking fees and a $175 expedite fee. An invoice will be submitted to the responsible party when the removal has been confirmed. Reservations requiring relocation of specialized zones that accommodate services including, but not limited to bus zones, media only zones, posted car share programs and taxis, will be subject to additional posting fees. Unless there is a street closure, motorcycle spaces are not typically relocated.

d) Requests to exchange a meter or color zone for another meter or color zone in the same area reflected on the original order will not incur additional charges, unless such requests are made less than 10 business days prior to the event start date and/or require any additional metered or un-metered area fees due to the nature of the request.
f) Submission of a Change Order is acknowledgement of a request for service to be performed and does not automatically guarantee the spaces. All change order applications must be approved by Parking Services prior to the event start date.
g) All Reservation Requirement rules apply.

City of Sacramento, CA (Continued)

5. POSTING REQUIREMENT: All regulatory signage for reservations must be posted within 72 hours of the event start date for notification purposes. Change order requests that prevent the City to post in this time frame, requests made less than 5 business days in advance or a failure by the reserving party to post within the proper time, cannot be guaranteed and will result in a high probability of transient vehicles utilizing parking in the reserved parking spaces due to lack of signage. Transient vehicles cannot be towed if signage was not posted 72 hours prior to the event.
6. PAYMENT: Payment is due upon receipt of invoice and must be submitted PRIOR to the event start date.
7. CANCELLATIONS: All cancellations must be received no less than 10 business days prior to the event start date via the online Reservation Change Order or by emailing MeterCSR@cityofsacramento.org. Failure to provide sufficient notice will result in an expedite fee of $175 being deducted from the total refund amount.
8. REFUNDS: Any reduction of meters from the original order will be credited back to the credit card used for payment or refunded in the form of a check.
   Any cancellation prior to the reservation effective date or reduction of meters from the original order will be credited back to the original credit card used for payment or will be refunded in the form of a check. No credits towards future meter and parking space reservations will be made. Cancellations made less than 10 business days of the reservation effective date will have the $175 expedite fee deducted from the total refund amount to cover administrative costs associated with cancellations.

WHERE IS THE METER NUMBER LOCATED?

The "**PKGS**" number is the "meter number" for each meter. It is located on each meter decal or meter display. For each meter being reserved, please input the PKGS number in the "Meter Number" field on the Meter Reservation Application. **Please do not use any other numbers other than PKGS numbers**.

City of Sacramento, CA (Continued)

METER & PARKING SPACE RESERVATION APPLICATION

1. All reservation requirements are applicable.
2. To submit an illustration of the parking area request, use the Parking Space Map.
3. All Reservation Applications must be approved by Parking Services prior to the reservation effective date. Inquiries on the status of any reservation may be emailed to MeterCSR@cityofsacramento.org.

Applicant Information

Company Name:
(Please use name that should b reflected on invoice.)

* Contact Name:

* Business Address:

(Street, City, State, and Zip Code)

* Phone Number:

* Email:

* Location or Address of Job Site or Special Event:

Note: &, <, and=""> are not acceptable in this field.

* Job Site Contact:

* Job Site Phone:

* Purpose of Use

Please provide details of the use of reserved spaces. Food trucks are not allowed to reserve meters unless it is part of a Special Event Permit. Reserved spaces for the exclusive use of bus loading/unloading passengers should ensure that the spaces reserved are in the traffic direction to allow passengers to safely load/unload onto the sidewalk. Reservations for valet use require a Valet Permit.

Use Description:

(Character limit: 512)

* Will there be a dumpster, portable potties, or a storage bin on site?

○ Yes ○ No

Dumpsters or any additional equipment must be removed prior to reservation end date and time.

* Is your request associated with a Special Event Street Closure?

○ Yes ○ No

Reservations involving street closures will automatically include all spaces and zones within the enclosed area.

* Have you submitted a Special Event Permit to the City of Sacramento?

○ Yes ○ No

* If yes, what is the official name of the event?

Will any portion of the payment of this reservation come from the City of Festivals Grant?

Yes No

* Meter Request Days and Times:

All meters will become available for public use from 6 p.m. through 6 a.m., Monday-Friday, and all day Saturday and Sunday, unless reservation requests otherwise.

Is this a street closure?

Yes No

* Start Date:

MonthDayYear Nov 28 2014

Last Date:
MonthDayYear Nov 28 2014

Days and times needed:
(i.e. Mon-Fri, Mon-Sat)

* Daily Use Time (restricting public use of space):

(i.e. 9 a.m. - 5 p.m.)

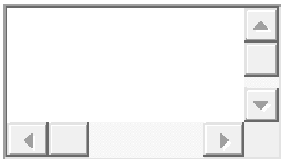
* Meters and Areas Requested

Parking placards will be provided and are based on the number of vehicles. Vehicles without the proper City-issued placards may be subject to citation. The number of placards cannot exceed the total number of spaces reserved. Placards must be displayed on the driver's side dashboard of each vehicle, with identifying information facing up and not covering the vehicle VIN. Permits will not be issued until payment of invoice is received prior to the reservation start date.

Meter Number(s):
Please indicate exact meter numbers you are requesting by listing the "PKGS" number reflected on the meter decal or meter display. Spaces needed for large equipment or dumpsters should be calculated in total spaces reserved. If the maximum number of characters is exceeded, please

email meter numbers requested to: MeterCSR@cityofsacramento.org and reference Company Name in subject line. Requests for 1-5 metered spaces: Please list each meter PKGS number. Requests for 6 or more metered spaces: Please provide specific identifying information about the location of meters (i.e. all meters on K Street between 9th and 10th Streets on the West side)

Un-metered Areas:



If requesting reservations for an area which does not have metered spaces, please describe the area by location in the space provided above. In addition, email a map attachment to MeterCSR@cityofsacramento.org. Refer to this application when emailing.

Number of Parking Permits:

One permit per parking space is required. Construction and Special Event permits must be displayed on each vehicle's left front dashboard. Equipment does not need a permit.

* Color Zones Requested:

- ○ White
- ○ Yellow
- ○ Blue
- ◉ Not Applicable

City of Sacramento, CA (Continued)

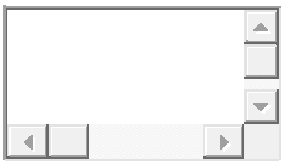
Meter & Parking Space Reservation Placards

Parking placards will be provided and are based on the number of vehicles. Vehicles without the proper City-issued placards may be subject to citation. The number of placards cannot exceed the total number of spaces reserved. Large units not bearing a license plate (i.e. storage bins, portable wash facilities) or vehicles parked in reserved areas do not require display of a parking placard. Placards must be displayed on the driver's side dashboard of each vehicle, with identifying information facing up and not covering the vehicle VIN. Permits will not be issued until payment of invoice is received prior to the reservation start date.

How many vehicles will require parking in the reserved area?

(This does not always equal the total number of spaces requested)

* Un-metered Areas:



If requesting reservations for an area which does not have metered spaces, please describe the area by location in the space provided below. In addition, email a Parking Space Map attachment to MeterCSR@cityofsacramento.org and reference Company Name in subject line.

Liability

SUBMISSION OF A METER & PARKING SPACE APPLICATION IMPLIES CONSENT TO THE AGREEMENT TERMS AND PRICING.

I HAVE READ AND AGREE TO FOLLOW THE REGULATIONS THAT GOVERN THE USE OF THE REQUESTED PARKING SPACES – METER & PARKING SPACE RESERVATION APPLICATION. METER & PARKING SPACE PLACARD HOLDERS WILL BE CITED IF REGULATIONS ARE NOT FOLLOWED. I UNDERSTAND THE REQUESTS MADE ON THIS FORM MAY BE SUBJECT TO VERIFICATION BY PARKING SERVICES PRIOR TO COMPLETION OF THIS ORDER AND ACKNOWLEDGE ALL FEES ASSOCIATED WITH THIS REQUEST.

Authorized Signature

* Date

YearMonthDay 2014 November 28

If you experience problems submitting this form, please contact our Website Administrator.

Example # 5

City of Louisville, KY

Request a Meter Bagging

Before your request for meter bagging is granted, **all** necessary permits must be obtained through Public Works (502-574-3121). A copy of all applicable Public Works permits, in addition to meter bagging fees (see meter bagging rate chart and map), are due in advance of your anticipated meter bagging to the PARC office. To ensure your bagging is completed on a timely basis, all request must be received by 4:00 p.m. of the business day preceding your meter bagging requested start date.

Meter Bagging Procedures

Please follow the steps outlined below as far in advance as possible:

1. Complete a Metered Bagging Request Form online with the information gathered in steps 2-5 prior to the meter bagging.

   Note: You can also print the Meter Bagging Request Form (pdf) with the information gathered in steps 2-5 prior to any meter bagging. This form is also available at the PARC office.

2. Collect the meter numbers (located on the front head of the meter, for example, MA-401 is the meter number for Main, meter #401) that you are requesting to be bagged. If you have any problems finding the meter number, contact the PARC office at 502-574-3817.
3. Contact Public Works (502-574-3121) to determine if you do or do not need a Public Works permit for the meters that you need to be bagged. This is imperative to ensure adherence to metro government policies and procedures.
4. Contact the PARC office (502-574-3817) to get a price quote on meter bagging or to tentatively schedule a meter bagging. Meter bagging fees are listed below on our Meter Bagging Rate Chart and Map. Discounted fees are available to contractors working downtown who are able to prove they are in good standing with the Louisville Metro Revenue Commission prior to their requested bagging date.
5. If a Public Works permit is necessary, bring a copy (or attach to the online form) of the permit to the PARC office at 211 West Muhammad Ali Blvd. along with a Meter Bagging Request Form (pdf) and a check payable to PARC for meter bagging fees (see #4) no later than 4:00pm on the preceding business day of your requested meter bagging to ensure your request is administered on a timely basis.

Meter Bagging Rate Chart
(rates as of July 1, 2014)

	Red Zone (Single Meter)	Red Zone (Double Meter)	Yellow Zone (Single Meter)	Yellow Zone (Double Meter)
Weekdays	$15.00	$30.00	$11.00	$22.00
Saturday	$15.00	$30.00	$11.00	$22.00
Sunday	$15.00	$30.00	$11.00	$22.00
Holidays	$15.00	$30.00	$11.00	$22.00

(Rates are charged per-space/per-day)

Use the Meter Bagging Rate Map to determine in which rate zone your meters are located.

If you have any other questions about meter bagging, please contact PARC at (502) 587-PARK (7275).

City of Louisville, KY (Continued)

LouisvilleKy.gov An official Louisville Metro Government website

Meter Bagging Request Form

Parking Authority of River City | 211 West Muhammad Ali Blvd. | Louisville, KY 40202

Contact Information

Company Name

First Last

Comany Address

Street Address

Address Line 2

City State / Province / Region

Postal / Zip Code Country

Contact Name *

First Last

Phone Number *

####

Fax Number

####

Email *

City of Louisville, KY (Continued)

Meter Bagging Information

Request must be received by 4:00 p.m. of the business day preceding your beginning bagging date.

Street Name *

Block Number

Meter Numbers *

Beginning Bagging Date *

MM / DD / YYYY

Ending Bagging Date *

MM / DD / YYYY

Bagging Removal Date *

MM / DD / YYYY

Verifying Information

Public Works Permit # *

Job #

Optional

Work Order #

Optional

Attach a File

Browse...

By checking this box, patron acknowledges all information is accurate and accepts responsibility for charges incurred. *

☐ I agree

Today's Date *

MM / DD / YYYY

Submit

City of Louisville, KY (Continued)

PARC

METER BAGGING REQUEST FORM

211 WEST MUHAMMAD ALI BLVD. · LOUISVILLE, KY 40202 · (502) 574-3017 · FAX (502) 574-4019

Contact Information

Company Name: _____ City: _____ State: _____ Zip: _____

Contact Name: _____ Street Address: _____

Phone Number: _____ Fax Number: _____ E-mail Address: _____

Meter Bagging Information (request must be received by 4:00 p.m. of the business day preceding your Beginning Bagging Date.)

Street Name: _____ Block Number: _____
(Street meters are located) (Block meters are located)

Meter Numbers: _____
(List all meter numbers to be bagged to insure bagging.)

_____

_____

Beginning Bagging Date: _____ Ending Bagging Date: _____ Bagging Removal Date: _____
(First day meters should be bagged) (Last day meters should be bagged) (Meter bags are removed on the morning following the Ending Bagging Date.)

Verifying Information

Public Works Permit #: _____ Job #: _____ Work Order #: _____
(Permit # showing that permission has been received to bag meters) (optional) (optional)

Patron's Signature: _____ Date: _____
(By signing, patron acknowledges all information is accurate and accepts responsibility for charges incurred.)

Office Use Only

Single Meters: _____ x 1 = # Spaces: _____

Double Meters: _____ x 2 = # Spaces: _____

Total Spaces: _____

Total Spaces: _____ x $ _____ (rate) = _____ x _____ (Number of Days) = $ _____

Total Spaces: _____ x $ _____ (rate) = _____ x _____ (Number of Days) = $ _____

Total Spaces: _____ x $ _____ (rate) = _____ x _____ (Number of Days) = $ _____

Invoice #: _____ **Total Invoice: $** _____

Payment

Credit Card Type: MC/VISA/AM.EXP./DISCOVER

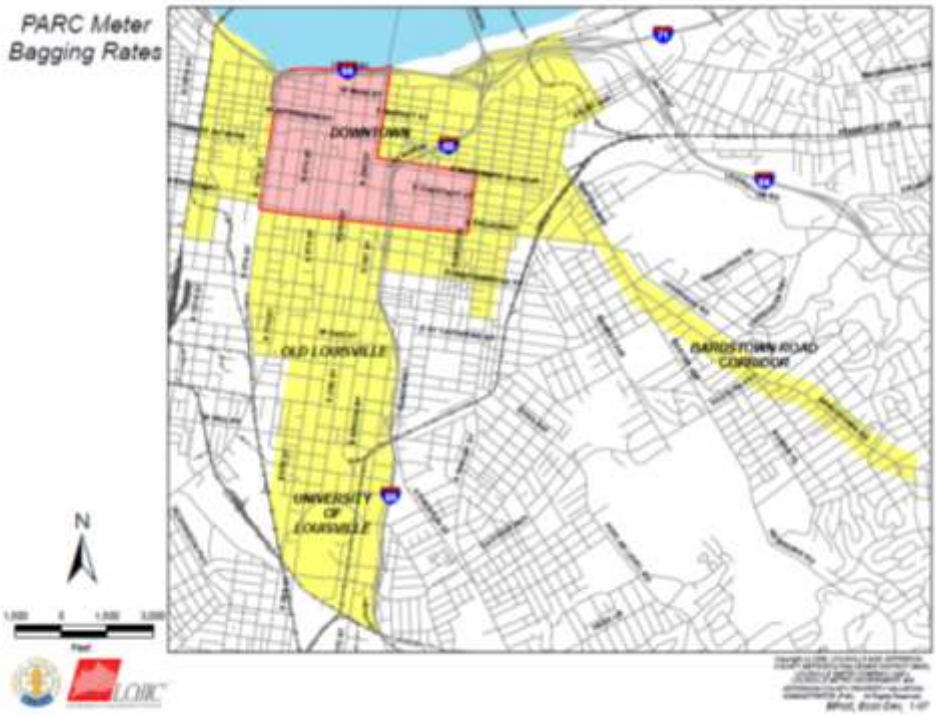
Name: _____

Credit Card #: _____

3 or 4 digit code: _____ Exp. Date: _____

Payment made by: (Circle One)
Check #: _____ Credit Card Cash

Clerk: _____ Date: _____



Example # 6

City of Madison, WI

Meter Hoods, Temporary No Parking Signs, Moving / Storage Containers

Meter Hoods / Bags

Meter Hoods can be used to secure on-street parking: to accommodate large moving trucks; to facilitate construction on property adjacent to the street; to accommodate weddings or funerals; to prohibit parking for block parties, races, or parades. City ordinance allows up to six meter hoods for weddings and funerals at no charge. All other uses require payment. If meter hoods are to be used as part of a block party, race, or parade, a Street Use Permit or Parade Permit must be obtained in advance. Contractors seeking parking may find contractor hang tags to be a viable option. Depending on the type of construction, a Street Occupancy Permit may be required. Call 608-266-4761 for more information.

- Meter Hoods are issued for a full day, 8am to 6pm, or half day, either 8am to 1pm or 1pm to 6pm. If the parking space will be in use before and after 1pm, a full day hood will be required.
- To offset lost revenue, the cost to reserve a parking space is $16 per full day and $9 per half day, Monday through Saturday. No fee is charged on Sundays. There is a $1 charge per paper Meter Hood.
- Hoods are placed on meters by the purchaser. The paper Meter Hoods must be removed immediately after use and recycled by the purchaser.
- For more information, or to request Meter Hoods call the Parking Utility at 608-266-4761.

EVENTS ON MADISON STREETS
STEP 1: START PLANNING YOUR EVENT

WHEN SHOULD I APPLY FOR A PERMIT FOR MY EVENT?

The application, documents and fee (non-refundable application fee made payable to City Treasurer) must be submitted at least **30 days prior** to your event. If there will be alcohol sold at your event applications must be submitted at least **60 days** prior to the event and you must also apply for a separate Beer/Wine Sales Permit through the Clerk's Office.

If special event resolutions are requested for your event, then submission a minimum 60 days before the event date is required. Resolutions are needed for:

- Suspension - In order to sell merchandise within your event area
- Invalidation - To invalidate City Vendors' Licenses within your event area

Both Suspension and Invalidation are known as "Exclusive Use"

City of Madison, WI (Continued)

Also, consider the following:

- If your event requires a Certificate of Insurance this document must be received by the City of Madison Risk Management Office 30 days prior to the event.
- Review the fee schedule (.pdf) to estimate the costs for your event and any extra permits or equipment rental you may need.
- Check the Madison Parks Events Calendar to see if your preferred date and location are available

There are many steps to planning a successful event in the city of Madison. It is vital that you read and complete every one of these steps. If you miss one, your permit application may denied. This website will take you, step by step, through all of the necessary requirements.

STEP 1: Start Planning Your Event

STEP 2: Application Requirements

STEP 3: Complete Event Schedule

STEP 4: Event Site Map

STEP 5: Safety and Security Plans

STEP 6: Trash and Recycling Plan

STEP 7: Notification Requirements

STEP 8: Certificate of Insurance for your event

STEP 9: Event Bicycle Parking

STEP 10: Event Marketing

STEP 11: Additional Permits; Special Event Vending License; Beer/Wine Sales Permit

STEP 12: Event Fees

STEP 13: Permit Application Submission and Follow-up

NEXT Go to STEP 2: Application Requirements
PREVIOUS Go to What is a Street Use Permit and when is one required?

City of Madison, WI (Continued)

Contractor Hangtags and Contractor Parking Permits

Contractor hangtag parking permits are available to meet the needs of contractors and repair persons working in areas where parking is controlled by parking meters.

- Offer more flexibility than meter hoods.
- Can be purchased in advance.
- Can be used at multiple locations.
- Full-day permits cost $16.00
- Half-day permits cost $9.00
- Purchase in-person at the Parking Utility Office or by mail.
- For use at an open parking space. Parking space is not guaranteed.
- Time-specific parking prohibitions are still enforced. Peak hour lanes and street sweeping zones, for example, must be vacated during times when parking is prohibited.
- Call (608) 266-4761 for more information.
- All rates subject to change.
- Download Contractor Hangtag Parking Permit Application (pdf)

Contractor parking permits are available to meet the needs of contractors, repair persons, and moving companies working in areas where parking is unmetered, but restricted to a duration of one or two-hours.

- Allow parking beyond the one or two-hour restriction.
- Can be purchased in advance.
- $5.00 per vehicle per day.
- Purchase in-person at the Parking Utility Office or by mail.
- For use at an open parking space. Parking space is not guaranteed.
- Time-specific parking prohibitions are still enforced. Peak hour lanes and street sweeping zones, for example, must be vacated during times when parking is prohibited.
- Call (608) 266-4761 for more information.
- All rates subject to change.
- Download Contractor Parking Permit Application (pdf)

Street Occupancy: Land Development

Contact: ✉ **Building Inspection** ☎ **(608) 266-4551**

When your construction or demolition requires materials or machinery to be on or over streets, sidewalks, alleys or public grounds a Street Occupancy permit is necessary. This ensures the welfare and safety of the users of adjacent properties [City Ordinance 29.10].

- Permit applications must be submitted 48 hours in advance of any street occupancy or street closures (this process may take longer if needed).
- The maximum number of days a permit can be issued for is 90 days.

Process Overview:

1. **Start Permit Process**

Discuss your site and building plans with the Inspection staff when you apply for a construction or demolition permit. Start the process for a Street Occupancy Permit the same time you apply for the other permits.

Where to go:
Building Inspection Permit Counter
Hours: 7:30 a.m. to 4:30 p.m., Monday through Friday
Madison Municipal Building
215 Martin Luther King Jr. Blvd., Suite LL 100
Madison, WI 53703

2. Obtain Certificate of Insurance

Obtain a copy of the City of Madison Certificate of Insurance at http://www.cityofmadison.com/finance/risk/ . Your insurance agent can place the mandatory coverage for the permit and complete the insurance certificate. Return this information to the Risk Manager for review and approval.

Where to go:
Finance Department
City-County Building
210 Martin Luther King Jr. Blvd., Room 406
Madison, WI 53703 (608) 266-5965

3. Apply for Permit

Obtain the Street Occupancy Permit application from the Permit Counter in the Department of Planning and Development. Turn in the completed application form at the same counter.

Fill out the top portion of the permit and draw a sketch of the location and the obstruction (a separate drawing may be attached if needed). The "Special Requirement for Occupancy" area is for office use; you are not required to fill this out.

Building Inspection staff and Traffic Engineering staff will review the application. A traffic control plan may be requested from the applicant if necessary.

4. Pay Fees

Building Inspection staff and Traffic Engineering staff calculate the fee. They will issue the permit after you pay the fee. If meter bags or "No Parking Anytime" signs are needed, the applicant will need to get these from Traffic Engineering's front counter.

5. Completion

Construction can proceed once the appropriate barriers are erected.

Related Forms & Handouts

- Street Occupancy Permit Application (pdf)
- Street Occupancy Permit for Recycling Application (pdf)
- Certificate of Insurance
- Development Guide (pdf)

Have Questions?

Contact Building Inspection - (608) 266-4551

Appendix 28

White Paper: Parking In-Lieu Fees

Appendix 28

White Paper: Parking In-Lieu Fees

Parking In-Lieu fees are one of the successful strategies for funding parking facility development noted in this parking strategic. This concept is generally well known, it can take several forms and can be applied in mandatory or optional formats. This whitepaper is intended to answer basic questions for those that are interested in better understanding this concept.

Note: The data in this whitepaper is now several years old. While the general principles remain valid, the costs per space are considered out dated.

Fees In Lieu of Required Parking

Introduction

Some cities allow developers to pay a fee in lieu of providing parking spaces required by zoning ordinances, and use this revenue to finance public parking spaces to replace the private parking spaces the developers would have been required to provide.

These in-lieu programs can reduce the cost of development, encourage shared parking, improve urban design, support historic preservation and allow development of sites that cannot physically accommodate the required parking. Establishment of in-lieu fees also reveals that the cost of complying with minimum parking requirements is more than four times the cost of the impact fees that cities levy for all other public purposes combined. The high cost of meeting parking requirements suggests other promising in-lieu policy options that allow developers to reduce parking demand rather than increase the parking supply and provide a mechanism to support alternative transportation modes that help accomplish that goal. Reducing parking demand can cost far less than increasing the parking supply.

Advantages of In-Lieu Fees

In-lieu fees have five major advantages for both cities and developers.

1. *A new option*. In-lieu fees give developers an alternative to meeting the parking requirements on sites where providing all the required parking spaces would be difficult or extremely expensive.

2. *Shared parking*. Public parking spaces allow shared use among different sites where the peak parking demands occur at different times. Shared public parking is more efficient and cost effective than single-use private parking because fewer spaces are needed to meet the total peak parking demand. Shared parking also allows visitors to leave their cars parked while making multiple trips on foot, and is one of the easiest ways to make better use of scarce urban land.

3. *Better urban design.* Cities can put public parking lots and structures where they have the lowest impact on vehicle and pedestrian circulation. Less on-site parking allows continuous storefronts without "dead" gaps for

adjacent surface parking lots. To improve the streetscape, some cities dedicate the first floor of the public parking structures to retail uses. Developers can undertake infill projects without assembling large sites to accommodate on-site parking, and architects have a greater range of design options that can translate into more attractive buildings.

4. Fewer variances. Developers often request parking variances when providing the required parking would be difficult. These variances create unearned economic windfalls, granted to some but denied to others. If developers can pay cash rather than provide the required parking, cities do not have to grant parking variances and can therefore treat all developers consistently.

5. *Historic preservation*. In-lieu fees allow adaptive reuse of historic buildings where the new use requires additional parking that is difficult to provide. The in-lieu policy therefore makes it easier to preserve historic buildings and rehabilitate historic areas.

Disadvantages of In-Lieu Fees

Officials in many cities recommended in-lieu fees, but some report that developers were initially skeptical. The following four points summarize the potential disadvantages mentioned by developers.

1. *Lack of on-site parking.* Parking is a valuable asset for any development. A lack of on-site, owner- controlled parking can reduce a development's attractiveness to tenants and customers. While a lack of on-site parking is a real disadvantage, developers who are concerned about this problem can normally provide the parking rather than pay the fee.

2. *High fees*. Cities may not construct and operate parking facilities as efficiently as the private sector. For example, cities may pay extra to improve the architectural design of parking lots and structures. The resulting in-lieu fees may be high. Although some cities charge high in-lieu fees, most set their in-lieu fees lower than the cost of providing a public parking space. Because the fixed cost for ramps, elevators, stairwells, and curb cuts can be spread among more spaces in large public parking structures, economies of scale in building these structures can further reduce the in-lieu fees.

3. *No guarantees.* Cities may intend to use the in-lieu fee revenue to finance public parking, but they do not guarantee when or where the parking spaces will be provided. To address this concern, some cities build public parking structures before receiving the in-lieu fees. The in-lieu fees are then used to retire the debt incurred to finance the structures. Other cities return the in-lieu fees if they do not provide the parking within a certain time. A city can also delay collecting the in-lieu fees until the revenue is needed to construct the public parking.

4. *Fewer parking spaces*. In-lieu fees will reduce the parking supply if cities provide less than one public parking space for each in-lieu fee paid. A smaller parking supply can put an area at a competitive disadvantage. Cities may not provide one public parking space for each in-lieu fee paid, but if a city uses in-lieu fees to build public parking spaces rather than grant variances to reduce parking requirements, the
In-lieu policy will increase rather than decrease the parking supply. Even if an in-lieu policy does reduce the parking supply, shared public parking reduces the parking supply needed to meet the sum of all individual peak parking demands.

While the developers' concerns cannot be ignored, officials in most of the surveyed cities said that the fees had become a form of administrative relief for developers who do not want to provide the required parking spaces. In practice, the in-lieu fees have benefited developers by offering them an alternative to building expensive parking spaces.

In Lieu Parking Program Examples

Miami's Coconut Grove, Florida (an upscale neighborhood of Miami)

Coconut Grove adopted a fee-in-lieu program in 1993 and has experienced considerable success. The fee is $10,000 per stall, or payments of $50/month/stall. Developers have opted out of 938 spaces, generating approximately $3 million in revenues. The majority of the funds were used to develop a 416-space garage with ground floor retail. The fund also paid for a $250,000 study for a downtown circulator, and $100,000 for a Parking Mitigation Project, that included landscaping changes and installation of traffic control devices to improve parking and pedestrian access. Business licenses can be revoked after 90 days of non-payment.

Lake Forest, Illinois

Lake Forest has had a fee-in-lieu policy for about 15 years. All funds generated must pay for parking acquisition or development. The impetus was a desire to preserve the historic character of the downtown. The fee was recently increased from $14,000 to $22,000 per stall. The parking requirements are also relatively high in Lake Forest, at four spaces per thousand. Still, developers want to use the option because of the scarcity of developable land.

The city considers the program effective, and developers use the option frequently. Originally, it was an automatic opportunity for developers to pay instead of building. However, due to limited opportunities for the city to provide new facilities, they recently restricted the fee-in-lieu option to a special use permit.

Jackson, Wyoming

Jackson Wyoming adopted a fee-in-lieu policy in 1994, in conjunction with a new Comprehensive Plan and the adoption of parking minimums. The fee-in-lieu option was in response to concerns that the parking minimums would hinder economic development. The per-stall fee ranges from $1,000 (up to four stalls) to $10,000 (more than 41 stalls), depending on the number of stalls being opted out. The City does not have a specific obligation regarding timeline or proximity of new parking, but the funds raised are restricted to construction of parking only.

The policy is used frequently. When the fee-in-lieu was adopted, existing properties that did not have parking were given transferable parking credits, so that even as the properties have been redeveloped, there has been no parking requirement. The City Planner interviewed felt that a Local Improvement District would have been more effective for providing parking.

Bend, Oregon

Bend's policy was adopted in 1992. It was initiated due to concerns about constrained land for development. Developers have the option of building, leasing off-site, or paying the fee. The option has been used frequently but the fee was set very low ($510 per stall). There are no specific obligations regarding timeline or proximity, but the fees must go into the parking fund and can pay for parking only (no TDM) either in or adjacent to the

CBD. They are currently having their policy evaluated, with consideration of increased fee. The limited funds generated have become problematic with expectations from property owners for the city to provide for parking.

Skokie, Illinois

Skokie adopted its fee-in-lieu policy in 1976. It was used primarily in the early 1980s, and once in the 90s, but not since. The city has high downtown vacancy rates (up to 40%), and parking shortages was not severe. The impetus for the policy was a desire to maintain the urban landscape, and to keep employee parking in the periphery of the core. The fee was set at $3,500, which most businesses consider “outrageous”. There were no specific guarantees regarding proximity, timeline, etc., but the money was limited to parking only. Developers do not have an option to variance out: they must either build parking or pay the fee. With adoption of a downtown redevelopment plan, the parking requirements were modified to a uniform one stall per 400 sf (commercial) and one per unit (residential). Most of the development recently has been mixed use with residential, so developers have provided parking.

Kirkland, Washington

The City of Kirkland adopted a fee-in-lieu policy in the late 1970s for use in the downtown core. The fee is set at $6,000 per stall, and has generated approximately $300,000. Some of the funds were used to conduct various parking studies. In addition, a portion of the funds was contributed to a parking structure the city recently built, but was not a significant share. The city has no specific obligations regarding proximity or timeline, but has not had problems with expectations on the part of property owners. The impetus was to reduce create shared parking facilities. The primary use of the program has been for changes in existing properties to uses that require more parking (such as changing retail to restaurant). It has not been used for new development or redevelopment projects, and therefore the funds generated have been limited.

City of Parksville, BC Canada

The City of Parksville adopted the following specific amendments to their cash-in-lieu parking program:

- Within the area identified as "Downtown Core" on Schedule "B" of the Official Community Plan, the Municipal Council will accept cash payment in lieu of the provision of on-site parking in the amount of $9,800.00 per space. (AMENDMENT BYLAW NO. 2000.25)
- Notwithstanding the foregoing, 100% of the parking requirement may be met through cash-in-lieu payment or a combination of cash payment in lieu of parking and the provision of on-site parking is acceptable. (Amendment Bylaw No. 2000.25)
- All monies received pursuant to the requirements of this Section shall be placed in a reserve fund established under Section 378 of the Municipal Act for the provision of new and existing off-street parking space, and the City shall use such funds only for that purpose.
- The requirements contained in this Section shall not be applied to any land, building or structure existing at the date of the adoption of this Bylaw so long as the land, building or structure continues to be put to a use which does not require more off-street parking spaces than were required of the use existing at the time this Bylaw was adopted.

How Cities Set the Fees

Cities use two basic approaches to set their in-lieu fees. The first is to calculate the appropriate fee per space on a case-by-case basis for each project. The second is to have a uniform fee per space for all projects.

One city has employed both methods. Until 1994, Beverly Hills used the first approach – a specific fee for each project. The in-lieu fee for a project was the estimated land-and-construction cost per space to build a nearby public parking structure. Between 1978 and 1992, developers paid in-lieu fees for 52 parking spaces. The per-space fee set for each project was the sum of (1) the value of 60 square feet of land within a 300 foot radius of the site, and (2) the average construction cost per space in municipal parking structures. The average fee was $37,000 per space, and the highest was $53,000 per space. Therefore, in the extreme case, a developer was willing to pay the city $53,000 for the right not to provide a parking space (Beverly Hills 1992).

This case-by-case procedure required a land-value appraisal to estimate the cost of public parking near each project that applied to pay the fee. After waiting four to six months to be notified of the fee, applicants usually appealed to the City Council to reduce it. Developers complained that not knowing the fee until after the appraisal created uncertainty in project planning. The case-by-case approach was complicated, time-consuming, and expensive.

To address these problems, Beverly Hills adopted the second approach in 1994 – it set uniform fees for all projects. These new fees are easier for the city to administer and for developers to use. Developers can easily incorporate the fee in a financial analysis and decide whether to provide the required parking or pay the fee. Thirty-seven of the 46 surveyed cities set uniform fees, probably because of their certainty, simplicity, and equity. Most cities' in-lieu fees do not cover the full cost of providing a public parking space. Cities aim to set their fees high enough to pay for public parking, yet low enough to attract development. Most cities have no explicit policy, regarding how often to revise their fees and some cities' fees have not changed for many years. A few cities automatically link their fees to an index of construction costs. For example, Beverly Hills and Palo Alto adjust their fees annually by the ENR Construction Cost Index, a measure of cost inflation in the construction industry.

Kirkland has two unusual in-lieu options. Developers can pay $6,000 per parking space not provided, and the subsequent owners must purchase one parking permit in a public lot for every three spaces not provided (because the city estimates that employees use one-third of the required parking spaces). Alternatively, developers pay no initial in-lieu fee but subsequent owners must purchase a parking permit in a public lot for each space not provided. This annual option reduces the capital cost of development and encourages the use of public parking. A property owner may cancel the annual agreement at any time by providing the required on-site parking.

German cities often have a graduated schedule of in-lieu fees (Ablösebeträge). The fees are highest in the city center and decline with distance from the center. For example, Hamburg's fee is $20,705 per parking space in the city center, and $11,300 in the area surrounding the center.

Vancouver has the most sophisticated method for calculating its in-lieu fee ($9,708 per space). This fee is the parking subsidy implicit in constructing a new public parking space, as measured by: (1) the land-and-construction cost per space in a public parking structure, minus (2) the present discounted value of the net

operating income per space during the expected 30-year life of the structure, minus (3) the present discounted value of the residual property value of the structure, per space, after 30 years. The in-lieu fee is thus the expected net present cost per space – all parking costs minus all parking revenues – over the structure's life. Developers who pay the fees do not subsidize the city, and the city does not subsidize developers. Instead, developers subsidize parking.

To summarize, some cities set the fees on a case-by-case basis, but most set uniform fees for all development. Cities use a wide variety of methods to set their in-lieu fees, which range from $2,000 to $27,520 per parking space not provided.

Who Decides Whether to Provide Parking or Pay Fee?

Most cities allow developers to choose whether to pay the fee or provide the parking, but a few cities require developers to pay the fee rather than provide the parking. Officials in these latter cities cited several reasons for requiring developers to pay the fees: to centralize parking facilities, put more of the parking supply under public management, encourage shared parking, discourage the proliferation of surface parking lots, emphasize continuous shop fronts, improve pedestrian circulation, reduce traffic congestion, and improve urban design. Some cities allow property owners to remove existing required spaces by paying in-lieu fees. This option consolidates scattered parking spaces, facilitates reinvestment in older buildings, and encourages more efficient use of scarce land previously committed to surface parking.

Most American cities reduce their parking requirements in the central business district (CBD). In contrast, German cities often have uniform parking requirements throughout the city, but allow developers in the CBD to provide only part of the required parking, and require them to pay fees for the rest.

For example, developers may provide at most 25 percent of the parking required for land uses in the center of Hamburg, and must pay fees in lieu of providing the rest of the parking.

In-lieu fees in the United States are legally justified by the nexus between the fees and the cost of providing public parking spaces. American cities therefore offer the in-lieu option only where they are prepared to spend the fee revenue to provide new public parking facilities. The nexus argument does not necessarily imply that the in-lieu revenue must be used to provide public parking, however, because a variety of transportation improvements can substitute for more parking. For example, British and German cities often use the in-lieu revenue to improve public transportation.

The Impact Fees Implicit in Minimum Parking Requirements

In some ways, parking requirements resemble impact fees. Many cities require developers to pay impact fees to finance public infrastructure – such as roads and schools – that development makes necessary. In Regulation for Revenue, Alan Altshuler and José Gómez-Ibáñez (1993) define these impact fees as "mandated expenditures by private land developers, required as a price for their obtaining regulatory permits, in support of infrastructure and other public services" (vii).

Parking requirements resemble impact fees because developers provide the required infrastructure – parking spaces – to obtain building permits. In-lieu parking fees also resemble impact fees because developers pay the fees to obtain building permits, and cities then use the revenue to pay for public infrastructure – parking spaces–

that the development makes necessary. When cities require developers to pay the fees rather than provide the parking, the in-lieu fees are impact fees.

We can use the in-lieu fees to estimate the impact fees implicit in parking requirements. Impact fees are usually levied per square foot of building area, while in-lieu fees are levied per required parking space not provided. To compare in-lieu fees with impact fees, we must first convert the in-lieu fees into a cost per square foot of building area. We can do this because cities usually require parking spaces in proportion to building area (on the assumption that building area determines parking demand). The in-lieu parking fees per square foot of building area reveal the impact fees implicit in the parking requirements themselves.

CITY	IN-LIEU PARKING FEE ($/space)	LAND USE	PARKING REQUIREMENT (spaces per 1,000 square feet)	PARKING IMPACT FEE ($/square foot)
(1)	(2)	(3)	(4)	(5)=(2)X(4)/1,000
Palo Alto, Calif.	$17,848	Offices	4.0	$71
Beverly Hills, Calif.	$20,180	Offices	2.9	$59
Walnut Creek, Calif.	$16,373	Offices	3.3	$55
Kingston upon Thames, U.K.	$20,800	Offices	2.3	$48
Carmel, Calif.	$27,520	Offices	1.7	$46
Mountain View, Calif.	$13,000	Offices	3.0	$39
Sutton, UK	$13,360	Offices	2.7	$36
Harrow, UK	$14,352	Offices	2.3	$33
Hamburg, Germany	$20,705	Offices	1.5	$32
Lake Forest, Ill.	$ 9,000	Offices	3.5	$32
Mill Valley, Calif.	$ 6,751	Offices	4.4	$30
Palm Springs, Calif.	$ 9,250	Offices	3.1	$28
Reykjavik, Iceland	$13,000	Offices	2.2	$28
Claremont, Calif.	$ 9,000	Offices	2.9	$26
Concord, Calif.	$ 8,500	Offices	2.9	$24
Davis, Calif.	$ 8,000	Offices	2.5	$20
Orlando, Fla.	$ 9,883	Offices	2.0	$20
Kitchener, Ontario	$14,599	Offices	1.3	$19
Chapel Hill, N.C.	$ 7,200	Offices	2.5	$18
Kirkland, Wash.	$ 6,000	Offices	2.9	$17
Hermosa Beach, Calif.	$ 6,000	Offices	2.6	$16
Berkeley, Calif.	$10,000	Offices	1.5	$15
Burnaby, British Columbia	$ 7,299	Offices	2.0	$15
Vancouver, British Columbia	$ 9,708	Offices	1.0	$10
State College, Penn.	$ 5,850	Offices	1.3	$ 8
Ottawa, Ontario	$10,043	Offices	0.7	$ 7
Calgary, Alberta	$ 9,781	Offices	0.7	$ 7
Port Elizabeth, South Africa	$ 1,846	Offices	2.3	$ 4
Waltham Forest, U.K.	$ 2,000	Offices	0.9	$ 2
MEAN	$11,305		2.3	$26
MEDIAN	$ 9,781		2.3	$24

Minimum Parking Requirements Considered as Impact Fees (for office buildings)

- In-lieu fees and parking requirements are for the city center in 1996. In-lieu fees and impact fees are expressed in US$.
- To obtain the parking requirement in spaces per 100 square meters, multiply the required spaces in Column 4 by 1 .076.

- To obtain the parking impact fee in dollars per square meter, multiply the impact fee in Column 5 by 10.76.

CITY	IN-LIEU PARKING FEE	LAND USE	PARKING REQUIREMENT	PARKING IMPACT FEE
	($/space)		(spaces per 1,000 square feet)	($/square foot)
(1)	(2)	(3)	(4)	(5)=(2)x(4)/1,000
Beverly Hills, Calif.	$20,180	Restaurant	22.2	$448
Palm Springs, Calif.	$ 9,250	Cabaret	28.6	$264
Mountain View, Calif.	$13,000	Assembly Hall	18.0	$234
Kingston upon Thames, U.K.	$20,800	Food Superstore	7.7	$160
Davis, Calif.	$ 8,000	Funeral Home	20.0	$160
Sutton, U.K.	$13,360	Food Superstore	8.5	$114
Kitchener, Ontario	$14,599	Manufacturing	7.7	$112
Calgary, Alberta	$ 9,781	Billiard Parlor	10.3	$101
Ottawa, Ontario	$10,043	Church	9.8	$ 98
Claremont, Calif.	$ 9,000	Theater	10.0	$ 90
Hermosa Beach, Calif.	$ 6,000	Theater	13.0	$ 78
Burnaby, British Columbia	$ 7,299	ArtGallery	10.3	$ 75
Palo Alto, Calif.	$17,848	All Uses	4.0	$ 71
Mill Valley, Calif.	$ 6,751	Assembly Hall	10.0	$ 68
Harrow, U.K.	$14,352	Garden Center	4.6	$ 67
Hamburg, Germany	$20,705	Garden Center	3.1	$ 64
Walnut Creek, Calif.	$16,373	Nonresidential	3.3	$ 55
Kirkland, Wash.	$ 6,000	Restaurant	8.0	$ 48
Carmel, Calif.	$27,520	Commercial	1.7	$ 47
Concord, Calif.	$ 8,500	Restaurant	4.0	$ 34
Port Elizabeth, South Africa	$ 1,846	Recreation Hall	18.6	$ 34
Reykjavik, Iceland	$13,000	Nonresidential	2.2	$ 28
Lake Forest, Ill.	$ 9,000	Restaurant	2.5	$ 23
Orlando, Fla.	$ 9,883	Nonresidential	2.0	$ 20
Chapel Hill, N.C.	$ 7,200	Offices	2.5	$ 18
Berkeley, Calif.	$10,000	Nonresidential	1.5	$ 15
Vancouver, British Columbia	$ 9,708	Nonresidential	1.0	$ 10
Waltham Forest, U.K.	$ 2,000	Shops	4.5	$9
State College, Penn.	$ 5,850	All Uses	1.3	$8
MEAN	$11,305		8.3	$ 88
MEDIAN	$ 9,781		7.7	$ 67

- In-lieu fees and parking requirements are for the city center in 1996. In-lieu fees and impact fees are expressed in US$.
- To obtain the parking requirement in spaces per 100 square meters, multiply the required spaces in Column 4 by 1.076.
- To obtain the parking impact fee in dollars per square meter, multiply the numbers in Column 5 by 10.76.
- The land uses are those with the highest minimum parking requirements in each city.

Minimum Parking Requirements Considered as Impact Fees
(For land uses with the highest parking requirements)

The average parking impact fee for the U.S. cities in the Table above is $31 per square foot, which dwarfs the impact fees levied for all other public purposes. A 1991 survey of 100 U.S. cities found that the impact fees for all purposes (roads, schools, parks, water, sewers, flood control, and the like) averaged $6.97 per square foot of office buildings (see Altshuler and José Gómez-Ibáñez 1993, 40). The average parking impact fee for office

buildings is thus 4.4 times the average impact fee for all other public purposes combined. If impact fees reveal a city's priorities for public services, many cities' highest priority is free parking.

Sources:

- *Excerpts from: Journal of Planning Education and Research 18:307-320. © 1999 Association of Collegiate Schools of Planning. Donald C. Shoup*
- Regulation for Revenue, Alan Altshuler and José Gomez-Ibáñez (1993)
- Planning Advisory Service. 19 64. Off-Street Parking Requirements. Report # 182. Chicago, Ill.: American Planning Association.
- Planning Advisory Service. 19 71. An Approach to determining Parking Demand. Report # 27 0. Chicago, Ill.: American Planning Association.

Appendix 29 - Recommended Parking Benchmarks

#	Benchmark Name	Type	Description
1	Total operating cost per space.	Cost	**Overall key benchmark.** Useful for year to year comparisons and for comparisons with operations of similar profiles. Divides total operating expenses by number of parking spaces.
2	Total revenue per space.	Productivity	**Overall key benchmark**. Measures revenue to size of program in relation to spaces.
3	Facilities and equipment long-term debt per space.	Cost	Measures total long-term debt to size of program in terms of spaces.
4	Percent of annual revenue committed to current principal and interest payment.	Relationship	Measures amount of revenue consumed by current debt payments.
5	Debt for facilities and equipment incurred for the last five years per space.	Cost	Measures five year debt assumption for facilities and equipment against size of program in terms of spaces. Important in setting baseline measurement for comparison with multi-year year parking improvement plans.
6	Average monthly permit revenue per space.	Relationship	Measures the monthly permit revenue to the number of spaces.
7	Total operating costs per Parking department FTE.	Cost	Useful for internal year to year tracking and comparisons to other operations with similar profiles. Divides total operating expenses by departmental FTE.
8	Total revenue per Parking department FTE.	Efficiency	**Overall key benchmark.** Measures income to staffing level.
9	Parking spaces per Parking department FTE.	Productivity	**Overall key benchmark.** Measures total staffing to size of program in relation to parking spaces.
10	Surface parking lot spaces as a percent of total spaces.	Relationship	For profile comparisons, this shows the balance between surface lot spaces and structured or on-street spaces.
11	On-street parking spaces as a percent of total spaces.	Relationship	Shows balance between on-street parking and surface lots or structured spaces.
12	Structured parking spaces as a percent of total spaces.	Relationship	Shows balance between structured spaces and street or surface lot spaces.
13	Administrative cost per space.	Cost	Measures administrative costs to size of program in respect to number of spaces.
14	Administrative costs as a percent of total costs.	Relationship	Reflects the portion administrative costs represent as a part of the whole. Look for "norms" within your peer group. Compare to operations with similar management profiles.
15	Security costs per space.	Cost	Measures security expenses to the size of the facility or operation.
16	Security costs as a percent of total costs.	Relationship	Reflects the portion security costs represent as a part of the whole. Look for "norms" within your peer group. Compare to operations with similar security profile.
17	Total enforcement process costs per space.	Cost	Quantifies total enforcement process costs by measuring to number of spaces in the program. Compare with similar enforcement profiles. (Total enforcement includes: issuing warnings/citiations, processing, adjudication and collections.)
18	Total maintenance costs per space.	Cost	Measures total maintenance expense to the size of the program in respect to spaces. Compare to operations with similar maintenance profiles. Match weather characteristics and American Concrete Institute (ACI) "durability zones".
19	Total maintenance costs as a percent of total operating costs.	Relationship	Reflects the portion of total operating costs which all maintenance absorbs. Match weather characteristics and American Concrete Institute (ACI) "durability zones" when making comparisons.
20	Equipment maintenance cost per space.	Cost	Measures equipment maintenance costs by size of program in respect to spaces.
21	Equipment maintenance costs as a percent of total maintenance costs.	Relationship	Measures what percent of maintenance costs are absorbed by equipment maintenance.
22	Equipment maintenance costs as a percent of total operating costs.	Relationship	Measures equipment maintenance costs as a percent of total operating costs.
23	Cashier station costs per space.	Cost	Measure cost of cashier operations to size of program in relation to spaces.
24	Cashier FTEs per space.	Productivity	Measure cashier staffing levels to size of program in respect to spaces.

Recommended Parking Financial Reporting Summary

Consolidated Statement of Revenues and Expenses

Appendix 30.

Operating Budget

Unit/Department	Gross Revenues (Year)	Total Expenses (Year)	Net Operating Surplus/(Deficit)
Off-Street Parking			
Hourly Parking Revenue			
(Validation Program)			
Monthly (Contract) Parking Revenue			
Special Event Revenues			
Other Parking Revenues			
Total Off-Street Parking Revenues			
Off-Street Facilities Operating Expenses			
Maintenance Reserves			
Debt Service			
Other Expenses			
Total Off-Street Parking Expenses			
Off-Street Net Operating Result			
On-Street Parking			
Parking Meter Revenue			
Staffing Costs			
Other Meter Collections Cost			
Meter Maintenance Costs			
Other Meter Program Costs			
Total Meter Program Expenses			
On-Street Net Operating Result			
Enforcement			
Citation Revenue			
Staffing Costs			
Equipment Maintenance Costs			
Adjudication Program Costs			
Other Enforcement Costs			
Total Enforcment Progam Expenses			
Enforcement Net Operating Result			
Other Revenue Sources			
Special Assessment			
Fee-In-Lieu			
Other Parking Revenues			
Total Other Parking Revenues			
Other Parking Expenses/Funding Obligations			
(Possible Examples)			
BID Contribution			
Transportation Program Funding			
Special Events Traffic Management			
Total Other Parking Expenses			
TOTAL SYSTEM REVENUES			
TOTAL SYSTEM EXPENSES			
TOTAL SYSTEM NET RESULT			

Capital Project Budget

(Approved Capital Budget Items)

	Budgeted (Year)	Spent (Year)
Project A		
Project B		
Project C		
Project D		
Project E		
Project F		
TOTAL		

Assessing an Uncertain Transportation Future

Projecting the Impact of Autonomous Vehicles and Shared Mobility Trends on Future Parking Demand

Parking Strategic Plan **-** Appendix 31

Prepared for:

Cleveland County / City of Norman

Oklahoma

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Kimley»Horn

March 2018

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EXECUTIVE SUMMARY

Assessing an Uncertain Transportation Future

Assessing an Uncertain Transportation Future explores several key areas that experts warn are likely to produce "significant disruptions" to the parking and transportation industries in the coming years. Specifically, the strong emergence of autonomous vehicles (AVs) as a potentially viable reality brings with it many positive elements, including greatly enhanced vehicular safety, a dramatic reduction in automobile related deaths and injuries, reductions in roadway congestion, reductions in vehicle emissions (assuming future AVs will primarily be electric vehicles), and especially significant to this study, the potential for a dramatic reduction in parking demand. Some estimations project that once autonomous vehicles are the dominant form of personal transport, parking demands could drop by as much as 40% – 50%. There are other shifts taking place in the transportation sector such as the emergence of what is being called "shared-use mobility" which ties to the changing preferences of younger generations to purchase "mobility as a service" instead of owning a vehicle.

A key element of these issues relates to the timing of these changes and how these changes are likely to unfold. The pace of advancement in vehicle technology, lidar and vehicle sensors, and connected vehicle technology such as GPS and in-car navigation, has been dizzying. This rapid advance, and the corresponding decrease in the costs of these technologies, has created a great deal of media attention leading to a wide range of opinions and speculation about the timing and impacts of the application of these transformative technologies. To be clear, there are many conflicting opinions about the true impacts these industry changes will bring. Some argue that vehicle miles traveled (VMT) will decrease, while others argue that VMT will actually increase. Some argue that single occupant vehicle use will decrease substantially, while others warn of an emerging and even less desirable phenomenon—zero-occupant vehicles (AVs with no passengers driving from place to place to pick up customers). Some argue that vehicle ownership rates will plummet, while others suggest that while vehicle ownership may decrease, the total number of vehicles on the road will actually increase.

Beyond these uncertainties, a host of other potential issues have also yet to be addressed—legal issues, regulatory issues, insurance issues, cost issues, significant job losses in a number auto and driver-related industries and more. These could all impact the predictions of when changes will begin to impact parking demand. Another factor to consider is geography. Most experts agree that many of these pending changes will happen first in major urban areas, with adoption lagging behind in more rural areas.

This report attempts to summarize the current state of the technological and policy issues, as well as provide the projections of leading industry experts related to implementation timelines of these emerging technologies. Based on this research, we will provide a set of recommendations related to parking and access planning, specifically related to new parking development. The primary concern we are trying to address is what is right amount of parking that should be provided, both in the short to medium term (3-10 years) and in the longer term (10-40 years).

Recommended Strategies

In general terms, we are recommending a combination of strategies that attempts to bridge the gap between providing adequate parking, based on the current transportation and parking paradigms, with projections for reduced parking demand in the longer term. We are also recommending a specific approach that attempts to merge a focus on effective parking management with a more comprehensive "access or mobility management" approach to community access overall. This approach promotes an integration of parking and transportation strategies as a means to minimize parking infrastructure investment without compromising service levels for the community overall.

With a more aggressive posture related to an integrated parking/mobility management approach, which will provide less total parking an increase in mobility options will be needed in the short to mid-term timeframes, which is important because of the uncertainty of how much parking will be needed in the future. We believe that this approach can also provide significantly higher levels of customer and staff service and satisfaction levels.

A key area of focus is the adoption and integration of a range of mobility management and transportation demand management strategies which will be implemented as part of a new Transportation Management Authority. These initiatives, if well-implemented, could reduce overall parking demand significantly and reduce the amount of parking needed in the short to mid-term timeframe. Another important component to this recommendation is a monitoring and evaluation component. If this recommendation is pursued, the goal would be to establish an initial baseline of parking and modal split metrics for the downtown area and update these metrics on an on-going basis. As the transportation system evolves over the next several years and decades, this monitoring system will provide data-driven management tools to assess changes in transportation options and parking demand, and determine which transportation alternatives have proven most effective.

If the demand for parking in the future is reduced by the projected 40-50%, progressive planners and architects are proposing options that would allow for parking structures that could be "adaptively reused" for other functions. This emerging concept has garnered much attention in recent months. This document also incorporates previously submitted materials for the types of changes that would need to be considered to create adaptable, "future-proofed" parking facilities.

This report suggests that a phased parking development plan be considered (Phase 1 being the next ten-year period). The Phase one period could use traditional parking structure planning assumptions and development practices. However, any additional parking infrastructure development that may be needed beyond the next 10 to 15 years should seriously consider the adaptive reuse approaches outlined in this report. The initial phase parking facilities could also be developed using the adaptive reuse approach, but any adaptive reuse strategy will come with an initial cost premium in the 18-25% range. (This premium would cover the costs of such elements as increased floor-to floor heights, extra structural capacity, and external ramping). If these facilities were eventually adapted to other uses, such as office space, the value of this adapted space would off-set some, if not all, of the premiums associated with the design modifications. On the other hand, it is less likely that the initial garages would be candidates for adaptive reuse compared to the garages built at a later date. One caveat to this general line of thinking is that garages located more closely to certain buildings or functions might be better candidates for adaptive reuse based on their proximity to key development sites and types of development. We encourage the design team to consider the potential for garage adaptive reuse before making final garage site selections. This phased approach to parking garage development takes into account the uncertainty of the future as it may or may not affect future parking demand.

It is worth noting that this approach has already been implemented on the new Apple campus in Cupertino, CA. City code required approximately 14,000 parking spaces for the new campus. Apple built the parking, but strongly believed that future demand would be much less than the required spaces, and designed the two large rectangular parking structures to be reused for additional office space. To our knowledge, this is the first significant application of this concept for new garage construction in the country.

Overall, we are proposing a comprehensive and multi-dimensional approach to manage not only parking, but also a more robust integrated mobility management system. This approach will reduce parking demand in the initial term, reduce the potential for overbuilding parking, provide a higher level of campus access and customer service, and offer flexible strategies for meeting the parking needs of the future (whatever they may be).

Parking Structure Development Costs Update

Based on a review of several industry sources, including hundreds of completed parking structure projects of varying size, scope, and geographic location (omitting parking structures that are entirely below-grade because the cost of such structures is much higher), the national median construction cost for a new parking structure in 2017 is approximately **$19,000 – $20,000 per space or $56.99 – $59.00 per square foot**, increasing approximately 2.5% from 2015, when the median cost was approximately $18,600 per space based on historical data.

Construction cost data does not include items such as land acquisition, architectural and engineering fees, environmental evaluations, materials testing, special inspections, geotechnical borings and recommendations, financing, owner administrative and legal, or other project soft costs. Soft costs are typically 15% to 20% of construction costs.

FEATURES TYPICALLY INCLUDED IN A MEDIAN COST PARKING STRUCTURE:

- Precast concrete superstructure
- Attractive precast concrete facade, but with basic reveal pattern
- Shallow spread footing foundations
- All above-grade construction
- 8’ 6” to 8’ 9” wide parking spaces
- Glass-backed elevators and unenclosed stairs clad with glass curtain wall to the exterior
- Basic wayfinding and signage
- Open parking structure with natural ventilation, without mechanical ventilation or fire sprinklers
- Little or no grade-level commercial space
- Basic parking access and revenue control system
- Energy efficient fluorescent lighting

ENHANCED DESIGN FEATURES THAT COULD INCREASE CONSTRUCTION COSTS ABOVE THE MEDIAN RANGE:

- Cast-in-place, post-tensioned concrete superstructure for lower maintenance
- Attractive facade with precast, brick, metal panels, and other materials
- 8’ 9” to 9’ 0” wide parking spaces for user comfort
- Green Garage Certification following the Green Parking Council standards
- Energy-efficient LED lighting with occupancy and photocell computer controls
- Custom wayfinding and signage system
- Storm water management including on-site retention/detention
- Deep foundations, such as caissons or pilings
- Below-grade construction
- Enclosed stair towers due to local code requirements
- Enclosed parking structure without natural ventilation, where mechanical ventilation and fire sprinklers are required • Grade-level commercial space
- Mixed-use development where the parking is integrated with office, retail, residential, or other uses
- State-of-the-art parking access and revenue control system
- License plate recognition systems
- Parking guidance systems
- Count system with variable message LED signs
- Pay-on-foot parking revenue control stations
- Wi-Fi and cellular services

FACTORS AFFECTING PARKING STRUCTURE COSTS

People often think of parking structure development costs primarily in terms of dollars per space, however, there are many other factors that should be considered. The cost of a parking space is a product of parking efficiency (SF per space) and structure efficiency (dollars per square foot). Each component plays a critical role in determining the ultimate cost of a parking facility. Parking efficiency is the total gross area of a parking structure, inclusive of stairs, elevators, and all parking floors, divided by the number of spaces. Typical parking efficiency for an above ground, stand-alone garage is 300 to 350 SF per space. Many below-grade or mixed-use garages can have parking efficiencies of 400 to 500 SF per space. Factors affecting parking structure development costs include:

- **Geography.** Construction costs vary by location due to regional factors such as the cost of labor and availability of materials. In addition, factors such as higher seismic regions and soil conditions have a large impact on cost.

- **Number of Parking Levels.** In general, a larger-footprint parking structure with fewer levels will cost less per parking space than a taller structure with a smaller footprint. The cost per square foot of the first level at-grade is less than levels elevated above the ground. A lower-height, larger-footprint structure will have a higher proportion of the cost in the first level. Taller structures are heavier which affects the foundation cost. A taller structure generally has a less efficient parking layout, which translates into more square footage for each parking space.
- **Parking Below-grade.** Parking below-grade is much more expensive than parking above-grade. A five-level, above grade parking structure may cost $50 per square foot. If this same structure is depressed one level below-grade, the cost can increase approximately 15% to $57.50 per square foot. If the same structure is put two levels below ground, the cost increases even more because of the impacts of having to dig deeper (45% higher than the original cost or approximately $72 per square foot).
- **Structural System.** 60% to 70% of parking costs are in the structural system. As such, the type of framing system will have a significant effect on the cost of each parking space. There are two general types of framing layouts—short-span and long-span. Short span requires a column approximately every three parking spaces (27x30 feet square) to support the floor slab. Long span requires columns spaced 60 feet apart, with beams spanning over the stalls and drive aisle. Generally, short-span systems cost less per square foot, but negatively effects efficiency. Long-span systems cost more per square foot, but result in more stalls in the same square footage.

  The structural system can be cast-in-place concrete, precast concrete, or structural steel. The most cost-effective option depends on the project's location and the region's preferred construction methods. The selection of a system not common in the area will generally cause the cost to increase.
- **Foundation.** Structures built in areas with poor soil conditions requiring more expensive, deeper foundation systems will cost more. The difference between a shallow and deep foundation system can increase the price approximately 10% overall—taking the cost from $50 to $55 per square foot, for example.
- **Architectural Facade Treatment.** The appearance of a parking structure is important to the surrounding environment. The cost of making that structure more aesthetically-pleasing can affect the cost per parking space of up to 15%. If the structural system is used to create the architectural facade, the cost per square foot will be less. However, the use of architectural elements in addition to the structural system will increase the cost. If the architectural design creates an inefficient structural system, the cost could increase drastically.
- **Total Parking Spaces.** A smaller project will cost more per space than a larger project. A 200-space parking structure on a small site may cost about 30% more per square foot than a 1,000-stall structure on a reasonably sized lot.
- **Parking Efficiency.** The cost of a parking space is the cost per square foot multiplied by the square foot per space. The more square footage per stall, the higher the cost.

  Example:
  – Typical efficiencies for short-span structures: 330-390 sf/stall
  – Typical efficiencies for long-span structures: 300-340 sf/stall
  – Typical efficiencies for mixed-use structures: 400+ sf/stall

  Example:

  Assume a 500-space structure costs $50 per square foot:

  330 sf/stall * 500 stalls = 165,000 sf * $50/sf = $8,250,000

  360 sf/stall * 500 stalls = 180,000 sf * $50/sf = $9,000,000

  The difference is $750,000, or $1,500 per stall.
- **Premium Elements.** Program elements added to parking will increase the cost per stall. A photovoltaic system covering 50% of the top level can add approximately 25-30% to the building's cost per square foot of the building. However, there may be operational cost savings that can support this type of elements. A mixed-use component will also increase the

cost per stall due to negative impacts on efficiency and the structural framing system. Special site conditions such as the need to reroute utility lines or perform substantial demolition may increase cost as well.

- **Market Conditions.** The cost of parking can be negatively and positively affected by market conditions by 10% or more. A normal bid market will generate four to six bids from qualified contractors. An aggressive bid market might see 10 or more bids, causing the price to decrease. This can also create concern if the bidders are not qualified. An impacted bid market might see one to three bidders and a price increase due to lack of competition.

In the end, most owners budget for parking in terms of dollars per space. To be as accurate as possible, it is best to understand the project in terms of parking efficiency as well as structural efficiency. Design decisions that enhance efficiency can often help make a project financially feasible.

Sources:

1. Fixr, Build a Parking Garage Cost (https://www.fixr.com/costs/build-parking-garage)
   Note: FIXR estimates a $59 per square foot cost, though their estimate of the national average stands between $50 to $70 for most projects.
2. International Parking Institute, “How Much Does a Structure Cost?” H. Dean Penny, Kimley-Horn
3. Victoria Transport Policy Institute, “Parking Costs” (www.VTPI.org)
4. Carl Walker, Inc., “Parking Structure Cost Outlook” (www.carlwalker.com)
5. *Parking Today*, “The Top 10 Issues Affecting the Cost of Building a Parking Space” by Watry Design

ASSESSING AN UNCERTAIN TRANSPORTATION FUTURE

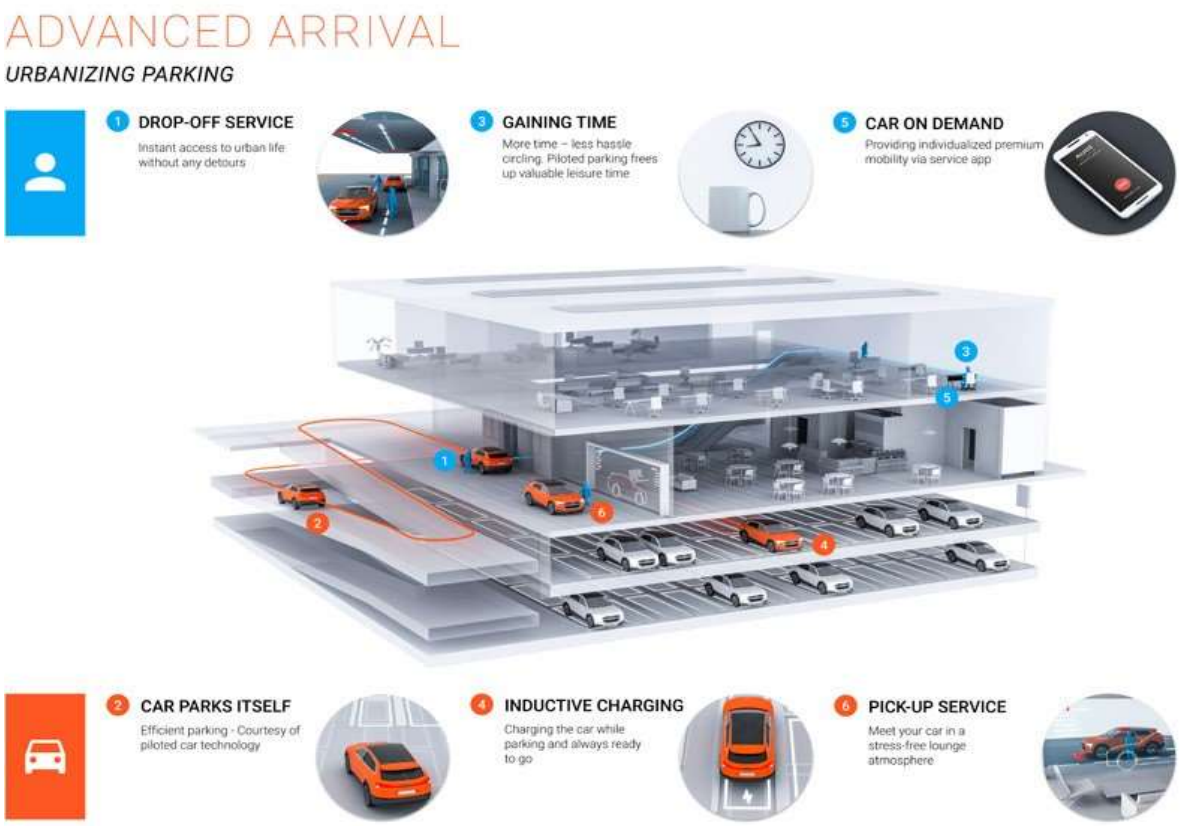
Assessing the Potential Impacts of Autonomous Vehicles and Shared-Use Mobility on Urban Transport and Parking

Overview

This section includes reviews and commentaries on autonomous vehicles and shared-use mobility, including an article written by noted transportation planner Todd Litman of the Victoria Transport Policy Institute. This article explores the impacts that autonomous (also called self-driving, driverless, or robotic) vehicles are likely to have on travel demands and transportation planning. As this is an emerging topic, general background information has been included in addition to specific issues related to the new campus.

This chapter begins with general commentary from industry experts regarding the nature and scale of the coming transformation of urban mobility, and the wide range of issues, potential disruptions, and impacts predicted. Our primary objective is to frame the national dialogue regarding these issues and create common context for the overall discussion. This overview is followed by a more detailed discussion of benefits and costs associated with autonomous vehicle (AVs), predictions related to development and implementation timelines, and explores how they will affect planning decisions such as optimal road, parking, and public transit supply.

While there are a wide range of predictions related to the timing of AV impacts (ranging from as little as five to ten years in more urban environments), Todd Litman's analysis indicates that some benefits, such as independent mobility for affluent non-drivers, may begin in the 2020s or 2030s. Most impacts, including reduced traffic and parking congestion (and road and parking facility supply requirements), independent mobility for low-income people (and the reduced need to subsidize transit), increased safety, energy conservation and pollution reductions, will only be significant when autonomous vehicles become common and affordable, probably in the 2040s to 2060s. Some benefits may require prohibiting human-driven vehicles on certain roadways, which could take longer.



Graphic courtesy of www.designboom.com

The Emerging Transformation of Urban Mobility

The following are excerpts from articles written by noted planners and industry experts related to the coming transformation of our transportation systems:

Getting Connected: What changes in technology mean for parking and municipalities in the 21st century and beyond.

Mark Braibanti | Director of Marketing, Excerpt from INRIXIPI *Parking Professional* Article, November 2016

- The growing millennial population, in combination with rapidly improving technology, is the stimulus for this change. Vehicle miles traveled decreased from 2003-2014 in the United States, but as a former traffic commissioner of New York City noted: “It wasn’t because of the recession. It was millennials. They were driving 20-25% fewer miles. That was extraordinary, and the trend was that driving and parking (for millennials) was a hassle.” As vehicle miles started to decrease, innovative technology, digitization, increased connectivity, and the millennial generation began fueling the demand for smarter, more integrated driving experiences.
- We are now is an era of data-centricity, with complex technology and algorithms improving diagnostics, navigation and hybrid vehicles. Among the technological innovations surfacing in the auto industry right now are what we call ACES: autonomous, connected, electric and shared vehicles.
- By 2020, BI Intelligence (a research service from *Business Insider*), estimates that 75% of cars shipped globally will be equipped with Internet connectivity. That equates to more than 250 million connected cars on the road in just 4 years. Compared with 25 million connected cars in 2015. This movement toward connected services represents a significant shift in technological needs for the auto industry.
- As much as real-time traffic is now viewed as being a necessity, drivers in the near future will expect their cars to help them easily find the closest and cheapest available parking, compare prices and types, and pay conveniently and seamlessly.
- Connected vehicles transmit a wide range of data that can be collected and used to predict current parking availability on city streets and at off-street parking facilities. Cars equipped with light detection and ranging sensors, usually used to let you know if you are getting too close to objects in the road, can be used to detect where open parking spaces are located as you drive.
- According to analysts at Frost and Sullivan, searching for parking costs consumers and local economies nearly $600 million in wasted time and fuel every year. The connected car will affect every facet of the transportation, parking and city planning industries. This makes connecting every component of the parking ecosystem to cars an essential part of the path forward. If not, parking lots risk being invisible to drivers if they aren’t integrated in to the next generation of connected cars. Much as cities were unprepared for ridesharing services such as Uber and Lyft, we cannot overlook the importance of connected cars. A new study by the National League of Cities recently revealed that 94% of the world’s cities are not prepared to deal with autonomous cars.

Old models for managing urban transportation are insufficient. New options demand that we think in terms of mobility.

Stephen Goldsmith | Harvard University, Contributing author to *Governing* Magazine

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- Urban mobility is undergoing its starkest transformation since the first Model T rolled off the assembly line more than a century ago. Emerging services like car-, bike- and ride-sharing have provided city dwellers with a vast—and often confusing—array of options for getting around. And it’s too early to predict the impact of technologies that are on the horizon, such as driverless cars.

- Today's changing needs demand that we find ways to bring together old and new modes of transportation so that they complement and enhance each other. With more and better data available now than ever before, we need to think in terms of true mobility management.
- That's a major departure from the traditional model in which cities or institutions might run a transportation department, a mass transit agency, a taxi commission and, perhaps in recent years, a bike-share program. That leaves individuals responsible for stitching together the various modes of transportation they need—car to bus, bus to train, train to bike and so on. As things stand, commuters can only make educated guesses about cost, duration and the likelihood of service availability and delays.
- In the new data-enabled, service-oriented model, government and institutional leaders will appoint mobility managers to enhance convenience and remove the transit deserts that plague many individuals who cannot afford cars and for whom inconveniently located bus routes provide little relief or for millennials who prefer the sharing economy approach as opposed to the vehicle ownership model of their parents. These mobility managers will help smooth transitions between public, private and shared transportation services. Individuals will be able to plan and pay for trips all in one place.

Urban Transportation's Multimodal Future: Networked alternatives for getting around are about to redefine our cities as much as the horseless carriage did a century ago.

Bob Graves | Associate Director of the Governing Institute

- The future, more and more urban transportation experts are coming to believe, lies in mobility-friendly networks in which cars are just one element—and an ever-shrinking one as we move from a system in which the personally owned vehicle is king and toward a multimodal future of on-demand driverless vehicles, ride-sharing, expanded public transit, greater reliance on human-powered transportation and other alternatives.
- How far could such a new mobility paradigm take us? Jerry Weiland, a 30-year veteran of General Motors who now leads the Rocky Mountain Institute's mobility program, believes that, over the long haul, the United States could reduce the number of urban/suburban vehicles on the road by up to 90% and in the process, redefine cities just as the horseless carriage once did.
- Whether or not this scenario plays out, it's clear that institutions and cities need a roadmap to guide the next generation of infrastructure investment decisions. Roads and bridges (and parking structures) last a long time, and new infrastructure is costly. What should city and institutional leaders be thinking about when they look at repositioning their infrastructure for the future? "The first thing cities and campuses should understand is that all of the transportation infrastructure is about networks, whether it's bike-share, whether it's light rail, whether it's roads," says Cooper Martin, co-author of a 2015 National League of Cities' report, **City of the Future: Technology & Mobility**. "One line, one bike-share station, one road doesn't cut it."
- Weiland says, "The new mobility has to offer people a complete answer, not a partial one. Otherwise you're not going to get rid of your car." It's safe to say that the best fail-safe alternative solution is a multimodal transportation system in which many options—bikes, transit, car- and ride-sharing—are readily available at a moment's notice along the direction of travel. With near real-time information, the traveler can seamlessly shift from one mode to another and choose the one most suited to his or her needs.
- Certainly, in rural communities—and no doubt many suburban ones—the personally owned car will remain the dominant transportation choice for some time. But in more urban settings, networked alternative transportation choices are already proving to be very dependable alternatives. With improving integration across transportation modes and seamless payment solutions, their growth is all but secured. Our mobility-friendly, multimodal urban transportation future may be closer that we realize.

Driverless Cars and the Disruptions They Will Bring: In planning for an autonomous-vehicle future, governments and institutions need to pay attention to the broader picture.

Bob Graves | Associate Director of the Governing Magazine

- It's easy to understand why the media is fascinated with autonomous vehicles. Scarcely a day goes by without another company's announcement of new driverless technology. The latest is Apple, which just received permission from the California Department of Motor Vehicles to test self-driving cars on the state's roadways. This brings the tally to 30 companies, not only the likes of Google and Tesla but also a long list of traditional automakers including BMW, Ford, GM, Honda, Mercedes-Benz, Nissan, Volkswagen and Subaru.
- However intriguing driverless cars may be conceptually, their integration into our transportation system will demand well informed and insightful planning. In response to this challenge, the Institute of Transportation Studies at the University of California, Davis last year launched its 3 Revolutions Policy Initiative to explore the impacts and synergies of vehicle automation along with two other disruptive technologies - electrification and vehicle sharing.
- The initiative's framing document lays out two possible future scenarios. In the first, in which the three emerging technologies are pursued in concert, "people have plentiful, accessible and affordable mobility options." We devote less precious space to parking; our air is cleaner and our communities are more livable. In the second scenario, governments allow car makers to rush gasoline-powered autonomous vehicles to market. Only the rich can afford them, and sprawl, traffic congestion and greenhouse-gas emissions worsen.
- Government planners will find Information generated from initiatives like this one critical. But there are signs that the private sector isn't likely to wait for government to exert its influence. Developers are already building what could be called "adaptable infrastructure."
- A case in point that is unfolding in Los Angeles, the nation's car capital, is described in a recent *Los Angeles Times* article. AvalonBay Communities Inc., one of the country's biggest developers, is designing a downtown residential complex for a future time when ride-sharing services and driverless cars whittle down car ownership and parking places become "expendable." Rather than building the traditional inclined floor garage, its level floors could be converted to "shops, a gym and a theater." The company also has been expanding the number of electric car charging stations in apartment complexes under construction and featuring prominent drop-off points for ride sharing.

A Big Makeover Is Coming to the Parking Garage of the Future Thanks to Autonomy: Autonomous cars will cause some substantial changes in how parking garages are designed

Urban Design Collaborative | Nashville, TN

- Back in January, Tesla Motors introduced "Summon," a feature that allows many of its newer vehicles to park themselves. Using a smartphone or key fob, car owners can remotely command their vehicles to open garage doors, enter, park themselves and shut down. When the cars are needed again, motorists can retrieve them in the same remote way.
- Other car companies are working on similar valet technologies, and the promise of cars that can park themselves is creating a ripple effect that stretches beyond the auto industry.
- Sometime later this year, excavators will start ripping into cement and construction crews will begin transforming 50 acres of an ordinary parking lot in a suburban Nashville office park into a future-minded space that brings together all the latest trends in urban planning.
- Developers intend to build a mix of retail spaces and residences that incorporate things like solar panels and green roofs. But that could describe any number of developments across the country. What makes this project most notable is that it's poised to include what is believed to be the nation's first parking structure designed for an era in which cars contain valet features like Summon and can park themselves and connect with broader transportation networks.

- Motorists might not think these drab structures would need to change in that transition. But like every other aspect of transportation being upended by technology, parking garages will be no different. Within the next two to five years, experts believe these technologies will begin to alter what drivers need from a parking garage. Further out, as that transition continues, existing structures may need to be retrofitted, and new ones rethought from the ground up. In Nashville, planners are trying to get a head start.
- "It's not even the clients pushing us, it's the investment group bringing the dollars to the table for the project, and they're saying, 'We need you to take this into consideration,'" said Brian Wright, founding Principal of Town Planning & Urban Design Collaborative, the company handling the Nashville project. "It really is a paradigm shift."
- Autonomous cars bring the likelihood that drop-off zones will be needed for vehicle occupants at the front of the buildings. Once occupants exit cars at a designated area, the cars can park themselves. And if there's no need for humans to exit parked cars, they can fit into narrower berths that may eventually shrink from a traditional 9-foot width to perhaps 7- or even 6.5-feet wide. Squeezing vehicles into tighter spaces in turn saves millions in costs for builders, home buyers and consumers alike. But that's just the small stuff.
- Connected cars add another dimension to the autonomous capabilities. Whether they're privately owned or shared vehicles, the ability to summon a ride remotely means garages may not even need to be located smack-dab in the middle of shopping districts or close to city centers. The garages can potentially be moved out of areas where real estate is at a premium. Not only does this mean big changes for parking garages, but big changes for the areas around them. Build too much parking, you generate traffic that congests your roadways.

It's Time to Think About Living in Parking Garages

Aarian March | LMN Architects, *Wired* Magazine, November 2, 2016

- The proposed 4th and Columbia project will include four floors of aboveground parking that can be converted to homes. The tower at 4th and Columbia will be the tallest in Seattle, a 1,029-foot, $290 million monument to the city's recent, tech-flavored success. Residential units, a hotel, office space, retail, eight floors of underground parking. Standard, shiny city stuff. And, if the current plans are approved, the tower will include a quirky twist: four levels of above-grade parking, designed to someday take on new life as apartments and offices.
- LMN Architects, which designed the project, wants the tower to survive 50 to 100 years. "If that's the case, we do need to make sure—I feel we do have the responsibility—that if the parking uses do change, we design to be able to adapt to that change," says John Chau, a partner at the firm. (The project is still moving through the city approval process, and will not be completed for another two to four years.)
- The change he's talking about is the coming transformation to a car-free-ish future. With rideshare, bikeshare, carshare, increasing transit options, and fully automated vehicles on the horizon, cities are less eager to allocate precious space for empty, parked cars. Already, places like Seattle have adjusted parking minimums, ditching rules that force developers to include parking for new projects near public transportation nodes.
- "A lot of people will start seeing a lot of these different shared services and say, 'OK, I don't actually need to own a car,'" says Scott Kubly, director of Seattle's Department of Transportation. (His family has relied on shared mobility services and transit since their personal car was totaled 10 months ago.)
- For the folks designing buildings to last decades or centuries, one way to prepare for that future is to consider life in the parking garage, laying the groundwork now for a retrofit to come. And Seattle's not the only city getting ready.

The Future of Mobility

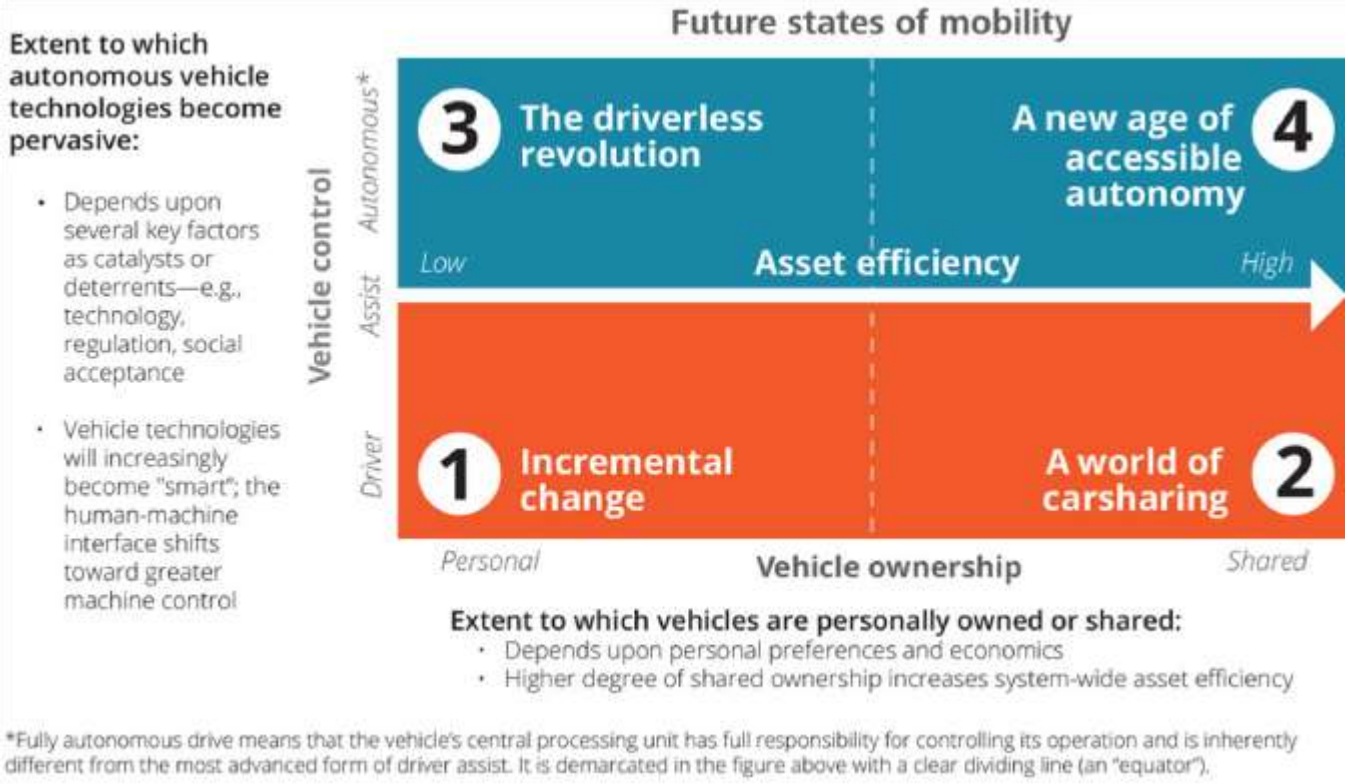
Deloitte Planning Series Article

- It is argued that four concurrent "future states" would emerge within the mobility ecosystem, emanating from the intersection of who owns the vehicle and who operates the vehicle: incremental change, a world of car sharing, the driverless revolution, and a new age of accessible autonomy (see illustration below).

    1. **Incremental Change:** This vision of the future sees private ownership remaining the norm as consumers opt for

    the forms of privacy, flexibility, security, and convenience that come with owning a vehicle. While incorporating driver-assist technologies, this future state assumes that fully autonomous drive doesn't completely displace driver-controlled vehicles anytime soon.

    2. **A World of Carsharing:** The second future state anticipates continued growth of shared access to vehicles through ridesharing and carsharing. Economic scale and increased competition drive the expansion of shared vehicle services into new geographic territories and more specialized customer segments. As shared mobility serves a greater proportion of local transportation needs, multi-vehicle households can begin reducing the number of cars they own, while others may eventually abandon ownership altogether.
    3. **The Driverless Revolution:** The third state is one in which autonomous drive technology* proves viable, safe, convenient, and economical, yet private ownership continues to prevail. Drivers still prefer owning their own vehicles but seek driverless functionality for its safety and convenience. This future will see a proliferation of highly customized, personalized vehicles catering to families or individuals with specific needs.
    4. **A New Age of Autonomy:** The fourth future state anticipates a convergence of both the autonomous and vehicle sharing trends. Mobility management companies and fleet operators offer a range of passenger experiences to meet widely varied needs at differentiated price points. Taking off first in urban areas but spreading to the suburbs, this future state provides seamless mobility.



Graphic courtesy of Deloitte University Press (DUPress.com)

**Definition: By autonomy and autonomous vehicles (AV), we refer to stage 4 of the NHTSA's scale of autonomy—i.e., full self-driving automation in which the passengers are not expected to take control for the entire duration of travel.*

- **An Impending Transformation.** Our analysis suggests these changes could occur more quickly and at greater scale than many are prepared for, especially in densely populated areas. If shared and autonomous vehicles are adopted as quickly as other technologies (like smartphones, cellphones, and the Internet), our modeling finds that significant change will begin within five years and that the market for personal mobility could transform dramatically over the next 25 years (see Appendix for additional details). Population growth and the extension of transportation to the previously immobile, such as adolescents, elderly, lower-income groups, and those with disabilities, could cause total miles driven to increase by as much as 25% by 2040. Of course, if these services and technologies are adopted at slower rates more akin to electricity, the radio, or the television, the speed and magnitude of the changes will lessen accordingly and potentially significantly.

Future-Proofing Cities over the Next Decade for Driverless Cars

Leslie Braunstein | Urban Land Institute, May 25, 2017

- Driverless cars could reduce the need for up to half the nation's billion or so parking spaces over the next half century, freeing 3 million acres—an area the size of Connecticut—for development or green space to help cool overheated cities, noted ULI Global CEO Patrick Phillips during the conference's luncheon session
- Revathi Greenwood, director of research and analysis for CBRE suggests a timeline that has four stages as driverless cars become more autonomous:

– Technology development stage (2016-2020): licensed drivers with full legal responsibility for the vehicle required.

– Partial driver substitution (2020-2025): requirements for legally responsible drivers relaxed.

– Complete self-driving (2025-2029): vehicles can drive and park themselves, but drivers can intervene.

– Widespread adoption (2029 and beyond): cars are completely self-driven, and drivers have limited to no control.
Car ownership will shift to a "pay-per-mile" approach, and the U.S. economy will be significantly altered.

Mary Berra | CEO, General Motors

"The auto industry is poised for more change in the next five to ten years than it has seen in the past 50."

Autonomous Vehicle Implementation Predictions

The following section quotes extensively from Todd Litman's May 2017 white paper on "**Autonomous Vehicle Implementation Predictions: Implications for Transport Planning**".

Autonomous (also called self-driving, driverless, or robotic) vehicles have long been predicted in science fiction and discussed in popular media. Recently, major corporations have announced plans to begin selling such vehicles, and some jurisdictions have passed legislation to allow such vehicles to operate legally on public roads (Wikipedia 2013).

Levels of Autonomous Vehicles (NHTSA 2013)
Level1—Function-specific Automation Automation of specific control functions, such as cruise control, lane guidance and automated parallel parking. Drivers are fully engaged and responsible for overall vehicle control (hands on the steering wheel and foot on the pedal at all times).
Level 2 — Combined Function Automation Automation of multiple and integrated control functions, such as adaptive cruise control with lane centering. Drivers are responsible for monitoring the roadway and are expected to be available for control at all times, but under certain conditions can disengage from vehicle operation (hands off the steering wheel and foot off pedal simultaneously).
Level 3 — Limited Self-Driving Automation Drivers can cede all safety-critical functions under certain conditions and rely on the vehicle to monitor when conditions require transition back to driver control.
Level 4—Self-driving Under Specified Conditions Vehicles can perform all driving functions under specified conditions.
Level 5 — Full Self-Driving Automation System performs all driving functions on normal road types, speed ranges, and environmental conditions.

Much speculation surrounds autonomous vehicle impacts. Advocates predict that affordable, self-driving vehicles will greatly reduce traffic and parking costs, accidents and pollution emissions, and chauffeur non-drivers, reducing roadway costs and eliminating the need for conventional public transit services. In this scenario, the resulting savings will be so great that such vehicles will soon be ubiquitous and everyone will benefit. However, it is possible that their benefits will be smaller and their costs greater than these optimist predictions assume. Only recently have transportation practitioners explored how autonomous vehicles will affect planning decisions such as roadway design, parking costs, and public transit demand.

Estimated Benefits and Costs

Potential Benefits

Advocates predict that autonomous vehicles will provide significant user convenience, safety, congestion reductions, fuel savings, and pollution reduction benefits. Such claims may be overstated. For example, advocates argue that because driver error contributes to more than 90% of traffic accidents, self-driving cars will reduce crashes by 90%. If they feel safer, vehicle occupants may reduce seatbelt use, other road users may become less cautious, vehicles may operate faster and closer together, and human drivers may be tempted to join autonomous vehicle platoons, which will introduce new risks and enforcement requirements.

Estimated congestion and parking cost reductions, energy savings and emission reductions are also uncertain due to interactive effects. For example, the ability to work and rest while traveling may induce some motorists to choose larger vehicles that can serve as mobile offices and bedrooms ("commuter sex" may be a marketing strategy) and drive more annual miles. Self-driving taxis and self-parking cars may increase empty vehicle travel. Although the additional vehicle travel provides user benefits (otherwise, users would not increase their mileage) it can increase external costs, including congestion, roadway and parking facility costs, accident risk imposed on other road users, and pollution emissions. Strategies, such as platooning, may be limited to grade-separated roadways, increasing congestion on surface streets by human-driven vehicles. Autonomous vehicles may also reduce public transit travel demand, leading to reduced service and stimulating more sprawled development patterns which reduce transport options and increase total vehicle travel.

Potential Costs

The incremental costs of producing autonomous vehicles are uncertain. AVs require a variety of special sensors, computers, and controls, which currently are expensive but likely to become cheaper with mass production. Because system failures could be fatal to both vehicle occupants and other road users, all critical components will need to meet high manufacturing, installation, repair, testing, and maintenance standards, similar to aircraft components, and so will probably be relatively expensive. Autonomous vehicle operation may require special navigation and mapping service subscriptions (which explains Google Corporation's interest in this technology). Simpler technologies still add hundreds of dollars to vehicle retail prices.

For example, GPS and telecommunications systems, review cameras, and automatic transmissions typically cost $500 to $2,000. Navigation and security services such as OnStar and TomTom have $200 to $350 annual fees. Autonomous vehicles require these plus other equipment and services (see box below).

Autonomous Vehicle Equipment and Service Requirements
Automatic transmissions.
Diverse and redundant sensors (optical, infrared, radar, ultrasonic and laser) capable of operating in diverse conditions (rain, snow, unpaved roads, tunnels, etc.).
Wireless networks. Short range systems for vehicle-to-vehicle communications, and long-range systems to access maps, software upgrades, road condition reports, and emergency messages.
Navigation, including GPS systems and special maps.
Automated controls (steering, braking, signals, etc.) Servers, software, and power supplies with high reliability standards.
Additional testing, maintenance, and repair costs for critical components, such as sensors and controls.

Manufacturers will need to recover costs for development, ongoing service (special mapping and software upgrades) and liability, while earning a profit. This suggests that when technology is mature, self-driving capability will probably add several thousand dollars to vehicle purchase prices, plus a few hundred dollars in annual service costs, adding $1,000 to $3,000 to annual vehicle costs. These incremental costs may be partly offset by fuel and insurance savings averaging approximately $2,000 for fuel and $1,000 for insurance per vehicle-year. If autonomous vehicles reduce fuel consumption by 10% and

insurance costs by 30%, the annual savings will total about $500, which will not fully offset predicted incremental annual costs.

Autonomous vehicles can be programmed to optimize occupant comfort. Some argue that because vehicle passengers tend to be more sensitive to acceleration than drivers, and occupants use travel time to work or rest (autonomous vehicle illustrations often show occupants playing cards or sleeping), it is plausible that users will program their vehicle for slower acceleration/deceleration characteristics than human powered vehicles, leading to reduced urban roadway capacity.

Shared Vehicles

Some advocates claim that self-driving capabilities will result in more vehicle sharing, including self-driving taxis and more private vehicle ridesharing. Estimates show that by allowing household vehicles to serve multiple residents, for example, taking a commuter to work and then transporting another household member for errands, vehicle ownership could be reduced by up to 43% and travel per vehicle increased by up to 75%, but these impacts are difficult to predict. There are many reasons that motorists may prefer a personal rather than shared vehicle—keeping tools or carrying dirty loads, because driving many annual miles, needing assistance provided by human drivers, or simply, for status. Autonomous taxis are likely to incur these additional costs:

- **Vehicle travel to trip origins.** This may be a modest cost in dense urban areas where taxis are widely distributed, but likely to add 10-20% to total vehicle travel in lower-density suburban and rural areas or for specialized vehicles, such as vans and trucks.
- **Cleaning and vandalism.** Taxis and public transit vehicles require frequent cleaning when passengers litter, smoke, or spill food and drinks, and repairs when vehicles are vandalized. To minimize these risks, self-driving taxis will need hardened surfaces, electronic surveillance, and aggressive enforcement. Assuming such vehicles make 200 weekly trips, 5-15% of passengers leave messes with $10-30 average cleanup costs, and 1-4% vandalize vehicles with $50-100 average repair costs, these costs would average between $200 and $1,700 per vehicle-week.
- **Reduced services.** Drivers often help passengers (particularly those with disabilities) in and out of taxis, carry luggage, ensure passengers safely reach destinations, and offer guidance to visitors.
- **Reduced comfort and privacy.** Vehicles designed to minimize cleaning and vandalism risks will probably have less comfort (no leather upholstery or carpeted floors), fewer accessories (limited sound systems), and less reliability (since vehicles will frequently need cleaning and repairs) than personal vehicles. Passengers will need to accept that their activities will be recorded.

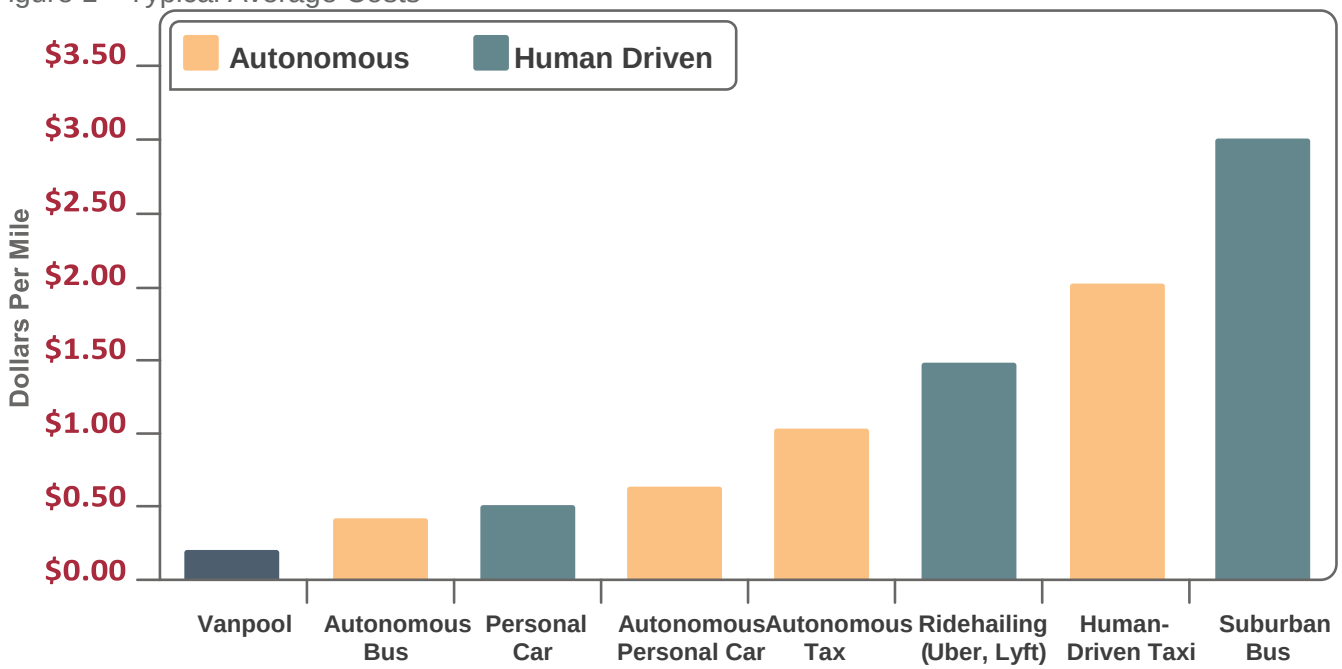
Personal automobiles typically cost about $4,000 annually in fixed expenses plus 20¢ per mile in operating costs. It is generally cheaper to use conventional taxis ($2-3 per mile) rather than own a personal vehicle driven less than about 2,500 annual miles, or rely on carsharing services ($60¢-$1 per mile) rather than own a vehicle driven less than about 6,000 annual miles. This suggests that autonomous vehicles will be a cost-effective alternative to owning a vehicle driving less than 2,500 to 6,000 annual miles, depending on cleaning and repair costs. **Table 1** summarizes trip types most suitable for self-driving taxis, a minority of total vehicle travel. Because of these additional costs, and reduced passenger comfort and privacy, it seems unlikely that most motorists will shift from owning vehicles to relying on self-driving taxis.

Table 1—Likely Uses of Self-Driving Taxis	
Suitable Uses	**Unsuited Uses**
Trips currently made by taxi or carshare vehicles. Utilitarian trips currently made by a private vehicle driven less than 6,000 annual miles.	Motorists who take pride in vehicles or value extra comfort. Motorists who drive more than 6,000 annual miles. Motorists who require special accessories in their vehicles. Motorists who often carry tools or dirty loads. Passengers who want assistance getting in and out of taxis. Passengers who place high values on privacy.

Self-driving taxis may allow some motorists to reduce their vehicle ownership, but impacts are likely to be modest and will depend on factors such as cleaning and vandalism costs, user comfort, and privacy.

Various studies have estimated that shared autonomous vehicles will cost $0.20-0.40 per passenger-mile (Bösch, et al. 2017), but these are mostly lower estimates that exclude some cost categories (such as vehicle cleaning, administration, and profits), use optimistic cost and occupancy assumptions, and ignore empty vehicle travel required for taxi services. A more realistic estimate for shared autonomous vehicle costs is likely to range from carsharing ($0.60- $1.00 per vehicle-mile, including ownership, operation and administrative costs) to human-operated taxis ($2.00-3.00 per vehicle-mile, including ownership, operation, administration and labor costs). Autonomous taxis will probably cost more per passenger-mile than transit bus service under urban conditions, but less than under suburban conditions.

Figure 1—Typical Average Costs



Vehicle costs vary depending on type, occupancy and travel conditions. Autonomous vehicles will cost somewhat more than human-powered cars, due to additional equipment and navigation systems required, but can offer somewhat cheaper taxi and bus services than those that are human-powered.

Impacts on Total Vehicle Travel

Table 2 lists various ways that autonomous vehicles can affect total vehicle travel (vehicle miles traveled or VMT). Although it is difficult to predict how these factors will interact, many studies suggest that by making vehicle travel more convenient, autonomous vehicles are likely to increase total vehicle travel unless specific demand management strategies are implemented, such as higher road user fees (Smith 2012). Trommer, et al. (2016) estimates that autonomous vehicles are likely to increase total vehicle travel 3-9% by 2035.

Table 2—Autonomous Vehicle Impacts on Total Vehicle Travel

Increases Vehicle Travel	Reduces Vehicle Travel
More convenient and productive travel (passengers can rest and work) will reduce travel time costs, stimulating more vehicle travel.	
Provides convenient vehicle travel to non-drivers (people too young, old, disabled, impaired, or otherwise lacking a drivers' license. Sivak and Schoettle (2015c) estimate that, accommodating non-drivers' latent travel demands could increase total vehicle by up to 11%.	More convenient shared vehicles allows households to reduce total vehicle ownership and use.
Self-driving taxis will travel more for empty back hauls.	Increases vehicle ownership and operating costs, further reducing private vehicle ownership.
Can make sprawled, automobile-dependent locations more attractive.	Self-driving transit vehicles improve transit services.
Reduces traffic congestion and vehicle operating costs, which induces additional vehicle travel.	Reduced pedestrian risks and parking demands makes urban living more attractive.
	Reduce some vehicle travel, such as cruising for parking spaces.

Self-driving vehicles can affect total vehicle travel (VTM) in various ways.

These scenarios illustrate how autonomous vehicles could impact various users travel patterns:

Jake is an affluent man with degenerating vision. In 2026, his doctor convinced him to give up driving. He purchases an autonomous vehicle instead of walking, transit, and taxis.

Impacts: An autonomous vehicle allows Jake to continue using a car, which increases his independent mobility, total vehicle ownership and travel, residential parking demand, and external costs (congestion, roadway costs, parking subsidies, and pollution emissions), compared with what would otherwise occur.

Bonnie lives and works in a suburb. She can bike to most destinations but occasionally needs to travel by car. In a city, she could rely on taxis and carsharing but such services are slow and expensive in suburbs. In 2030, a local company started offering fast and affordable automated taxi services.

Impacts: Autonomous vehicles allow Bonnie to rely on shared vehicles rather than purchase a car, which reduces her total vehicle travel, residential parking demand, and external costs.

Malisa and Johnny have two children. Malisa works at a downtown office. After their second child was born in 2035, they shopped for a larger home. With conventional cars, they would only consider houses within a 30-minute drive of the city. More affordable autonomous vehicles allowed them to consider more distant homes, with commutes up to 60-minutes, during which Malisa could rest and work.

Impacts: Affordable new autonomous vehicles allow Malisa and Johnny to choose an exurban home which increased their total vehicle travel and associated costs, plus other costs caused by sprawl.

Garry is hardworking and responsible when sober, but a dangerous driver when drunk. By 2040, he has accumulated several impaired citations and caused a few accidents. With conventional cars, Garry would continue driving impaired until he lost his drivers' license or caused a severe crash, but affordable used self-driving vehicles allow lower-income motorists like Garry to avoid such problems.

Impacts: Affordable used autonomous vehicles allow Garry to avoid impaired driving, accidents and revoked driving privileges, which reduces crash risks but increases his vehicle ownership and travel, and external costs compared with what would otherwise occur.

Table 3 summarizes the resulting impacts of these various scenarios. This suggests that in many cases autonomous vehicles will increase total vehicle mileage.

Table 3—Autonomous Vehicle Scenario Summary

	User Benefits	Travel Impacts	Infrastructure Impacts
Jake	Independent mobility for nondrivers	Increased vehicle travel and external costs	Increased residential parking and roadway costs
Bonnie	Vehicle cost savings	Reduced vehicle ownership and travel	Reduced residential parking and roadway costs
Malisa & Johnny	Improved home location options	Increased vehicle ownership and travel	Increased residential parking and roadway costs
Garry	Avoids driving drunk and associated consequences	Less high-risk driving, more total vehicle travel	Increased residential parking and roadway costs

Autonomous vehicle availability can have various direct and indirect impacts.

This analysis suggests that effects which increase motor vehicle travel are more numerous and significant than those that reduce vehicle travel. With that in mind, self-driving vehicles are likely to increase total vehicle travel, although these impacts are difficult to predict and will depend on specific autonomous vehicle implementation, such as their actual performance and user costs as well as other factors that affect vehicle travel such as fuel and road prices. Increases in total vehicle travel may be somewhat offset by reductions in per-mile costs of this incremental travel. For example, self-driving cars may impose less traffic congestion, parking costs, accident risk, and air pollution costs than human-operated vehicles per mile traveled which would counter the increased vehicle travel costs although the net effects are uncertain.

Summary of Benefits and Costs

Table 4 summarizes expected autonomous vehicle benefits and costs.

Table 4—Autonomous Vehicle Potential Benefits and Costs	
Benefits	**Costs/Problems**
Reduced driver stress. Reduce the stress of driving and allow motorists to rest and work while traveling. ***Reduced driver costs.*** Reduce costs of paid drivers for taxis and commercial transport. ***Mobility for non-drivers.*** Provide independent mobility for non-drivers, and therefore reduce the need for motorists to chauffeur non-drivers, and to subsidize public transit. ***Increased safety.*** May reduce many common accident risks and therefore crash costs and insurance premiums. May reduce high-risk driving, such as when impaired. ***Increased road capacity, reduced costs.*** May allow platooning (vehicle groups traveling close together), narrower lanes, and reduced intersection stops, reducing congestion and roadway costs. *More efficient parking, reduced costs*. Can drop off passengers and find a parking space, increasing motorist convenience and reducing total parking costs. *Increase fuel efficiency and reduce pollution.* May increase fuel efficiency and reduce pollution emissions. ***Supports shared vehicles.*** Could facilitate carsharing (vehicle rental services that substitute for personal vehicle ownership), which can provide various savings.	***Increases costs.*** Requires additional vehicle equipment, services and maintenance, and possibly roadway infrastructure. *Additional risks.* May introduce new risks, such as system failures, be less safe under certain conditions, and encourage road users to take additional risks (offsetting behavior). ***Security and Privacy concerns.*** May be used for criminal and terrorist activities (such as bomb delivery), vulnerable to information abuse (hacking), and features such as GPS tracking and data sharing may raise privacy concerns. ***Induced vehicle travel and increased external costs.*** By increasing travel convenience and affordability, autonomous vehicles may induce additional vehicle travel, increasing external costs of parking, crashes and pollution. ***Social equity concerns.*** May have unfair impacts, for example, by reducing other modes' convenience and safety. ***Reduced employment and business activity.*** Jobs for drivers should decline, and there may be less demand for vehicle repairs due to reduced crash rates. ***Misplaced planning emphasis***. Focusing on autonomous vehicle solutions may discourage communities from implementing more cost-effective transport solutions such as better walking and transit improvements, pricing reforms and other demand management strategies.

Autonomous vehicles can provide various benefits and impose various costs.

Some impacts, such as reduced driver stress and increased urban roadway capacity, can occur under level 2 or 3 implementation, which provides limited self-driving capability, but many benefits, such as significant crash reductions, road and parking cost savings and affordable mobility for non-drivers, require that level 4 vehicles become common and inexpensive.

Development and Deployment

Table 5 summarizes the likely stages of autonomous vehicle development and deployment.

Table 5—Autonomous Vehicle Implementation Stages
(Wikipedia 2013; NHTSA 2013)

Stage	Notes
Level 2—Limited automation (steering, braking and lane guidance)	Current state of art technology, available on some vehicles.
Coordinated platooning	Currently technically feasible but requires vehicle-to-vehicle communications capability, and dedicated lanes to maximize safety and mobility benefits.
Level 3—Restricted self-driving	Currently being tested. Google experimental cars have driven hundreds of thousands of miles in self-drive mode under restricted conditions.
Level 4—Self-driving in all conditions	Requires more technological development.
Regulatory approval for automated driving on public roadways.	Some states have started developing performance standards and regulations that autonomous vehicles must meet to legally operate on public roads.
Fully-autonomous vehicles available for sale.	Several companies predict commercial sales of “driverless cars” between 2018 and 2020, although their capabilities and prices are not specified.
Autonomous vehicles become a major portion of total vehicle sales.	Will depend on performance, prices and consumer acceptance. New technologies usually require several years to build market acceptance.
Autonomous vehicles become a major portion of vehicle fleets.	As the portion of new vehicles with autonomous driving capability increases, their portion of the total vehicle fleet will increase over a few decades.
Autonomous vehicles become a major portion of vehicle travel.	Newer vehicles tend to be driven more than average, so new technologies tend to represent a larger portion of vehicle travel then the vehicle fleet.
Market saturation.	Everybody who wants an autonomous vehicle has one.
Universal	All vehicles operate autonomously.

Autonomous vehicle implementation will involve several phases.

As of 2016, many new vehicles have some level 1 automation features, including cruise control, obstruction warning, and parallel parking. Some manufactures, such as Tesla, now offer level 2 features such as automated lane guidance, accident avoidance, and driver fatigue detection. Coordinated platooning is now technically feasible but not operational because many benefits require dedicated lanes. Google’s level 3 test vehicles have reportedly driven hundreds of thousands of miles under restricted conditions, including specially mapped routes, fair weather, and human drivers able to intervene when needed (Muller 2013). Some manufacturers aspire to sell level 4 automation vehicles within a few years but details are uncertain; early versions will probably be limited to controlled environments, such as freeways (Row 2013).

Despite this progress, significant technical improvement is needed to achieve unrestricted level 4 operation (Simonite 2016). Since a failure could be deadly to vehicle occupants and other road users, automated driving has high performance requirements. Sensors, computers, and software must be robust, redundant, and resistant to abuse.

Several more years of development and testing will be required before regulators and potential users gain confidence that level 4 vehicles can operate as expected under all conditions (Bilger 2013; Schoettle and Sivak 2015).

Implementation Projections

Autonomous vehicle implementation can be predicted based on the pattern of previous vehicle technologies, and vehicle fleet turnover rates.

- **Automatic Transmissions** (Healey 2012). First developed in the 1930s, automatic transmissions were not reliable and affordable until the 1980s. Now standard on most U.S. medium and high-priced vehicles, although some models have manual mode. When optional, they typically cost $1,000 to $2,000. Current vehicle market shares are about 90% in North America and 50% in Europe and Asia.
- **Air Bags** (Dirksen 1997). First introduced in 1973, this feature was initially an expensive and sometimes dangerous option (they could cause injuries and deaths). As air bags became cheaper and safer, they became standard on some models starting in 1988, and mandated by U.S. federal regulation in 1998.
- **Hybrid Vehicles** (Berman 2011). Commercially available in 1997, the prices of these vehicles were high and the performance was poor. Their performance and usability has improved but typically add about $5,000 to vehicle prices. In 2012, they represented about 3.3% of total vehicle sales.
- **Subscription Vehicle Services.** Navigation, remote lock/unlock, diagnostics, and emergency services. OnStar became available in 1997, TomTom in 2002. These systems typically cost $200-400 annually. About 2% of U.S. motorists subscribe to the largest service, OnStar.
- **Vehicle Navigation Systems** (Lendion 2012). Vehicle navigation systems became available as expensive accessories in the mid-1980s. In the mid-1990s, factory-installed systems became available on some models for about $2,000. Performance and usability have since improved, and prices have declined to about $500 for factory-installed systems and under $200 for portable systems. They are standard in many higher-priced models.

Table 6 summarizes the deployment cycles for these technologies—from first commercial availability to market saturation. Most technologies require decades of development and market growth to saturate their potential markets and, in many cases, never become universal. Airbags had the shortest cycle and the most complete market share due to federal mandates. Automatic transmissions required more than five decades for prices to decline and quality to improve, but are still not universal. Hybrid vehicles are still developing after 15 years on the market, have substantial price premiums, and modest market share. This suggests that new vehicle technologies generally require two to five decades from commercial availability to market saturation, and will not become universal without government mandates.

Table 6—Vehicle Technology Deployment Summary

Name	Deployment Cycle	Typical Cost Premium	Market Saturation Share
Air bags	25 years (1973-1998)	A few hundred dollars	100%, due to federal mandate
Automatic transmissions	50 years (1940s-1990s)	$1,500	90% U.S., 50% worldwide
Navigation systems	30+ years (1985-2015+)	$500 and rapidly declining	Uncertain; probably over 80%
Optional GPS services	15 years	$250 annual	2-5%
Hybrid vehicles	25+ years (1990s-2015+)	$5,000	Uncertain. Currently about 4%

New technologies usually require several decades between commercial availability to market saturation.

Modern vehicles are durable, resulting in slow fleet turnover. Median operating lives increased from 11.5 years for the 1970 model year, to 12.5 years for the 1980 model year, and 16.9 years for the 1990 model year (ORNL 2012, Table 3.12), suggesting that current vehicles may have 20-year or longer average lifespans. As a result, new vehicle technologies normally require three to five decades to be implemented in 90% of operating vehicles. Deployment may be faster in developing countries where fleets are expanding, and in areas with strict vehicle inspection requirements, such as Japan's shaken system. Annual mileage tends to decline as vehicles age. For example, 2001 vehicles averaged approximately 15,000 miles their first year, 10,000 miles their 10th year, and 5,000 miles their 15th year. Vehicles older than ten years represent about 50% of the vehicle fleet but only about 20% of vehicle mileage (ORNL 2012, Table 3.8).

As previously described, autonomous driving capability will probably increase vehicle purchase prices by thousands of dollars, and may require hundreds of dollars in annual subscription fees for special navigation and mapping services. Although self-driving vehicles may provide large benefits to some users (high-income non-drivers, long-distance automobile commuters, and commercial drivers), it is unclear what portion of motorists will consider the benefits worth the additional costs. A recent consumer survey found general support for the concept, but also significant concerns about privacy and safety, and relatively low willingness to pay extra for self-driving capability features (Schoettle and Sivak 2014).

Table 7 summarizes projected autonomous vehicle implementation rates based on previous vehicle technology deployment. This assumes that fully-autonomous vehicles are available for sale and legal to drive on public roads around 2020. As with previous vehicle technologies, these AVs will be imperfect initially (poor reliability and performance, and difficult to operate) and costly (tens of thousands of dollars in price premiums). As such, they will represent a small portion of total vehicle sales, with market share increasing during subsequent decades as their performance improves, prices decline, and benefits are demonstrated. Over time they will increase as a share of total vehicle fleets. Since newer vehicles are driven more than average annual miles, their share of vehicle travel is proportionately large. Without mandates, deployment will probably follow the pattern of automatic transmissions, which took nearly five decades to reach market saturation, and a portion of motorists continue to choose manual transmissions due to personal preferences and cost savings.

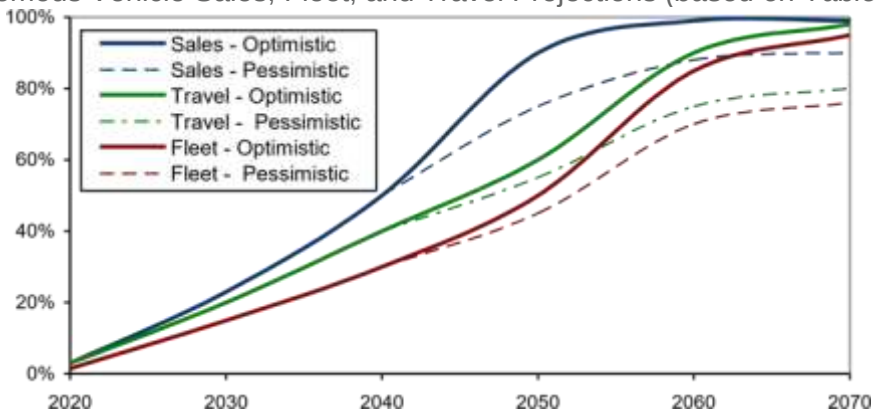
Table 7—Autonomous Vehicle Implementation Projections

Stage	Decade	Vehicle Sales	Vehicle Fleet	Vehicle Travel
Available with large price premium	2020s	2-5%	1-2%	1-4%
Available with moderate price premium	2030s	20-40%	10-20%	10-30%
Available with minimal price premium	2040s	40-60%	20-40%	30-50%
Standard feature included on most new vehicles	2050s	80-100%	40-60%	50-80%
Saturation (everybody who wants it has it)	2060s	?	?	?
Required for all new and operating vehicles	???	100%	100%	100%

Autonomous vehicle implementation will probably take several decades.

Figure 2 illustrates the deployment rates from Table 6. If accurate, in the 2040s autonomous vehicles will represent approximately 50% of vehicle sales, 30% of vehicles, and 40% of all vehicle travel in the 2040s. Only in the 2050s would most vehicles be capable of automated driving.

Figure 2—Autonomous Vehicle Sales, Fleet, and Travel Projections *(based on Table 6)*



If autonomous vehicle implementation follows the patterns of other vehicle technologies, it will take one to three decades to dominate vehicle sales, plus one or two more decades to dominate vehicle travel. Even at market saturation, it is possible that a significant portion of vehicles and vehicle travel will continue to be self-driven, indicated by the dashed lines.

Autonomous vehicle implementation could be even slower and less complete than these predictions. Technical challenges may be more difficult to solve than expected, so fully self-driving vehicles may not be commercially available until the 2030s or 2040s. They may have higher than expected production costs and retail prices, their benefits may be smaller and problems greater than predicted, and technical constraints, privacy concerns, and personal preference may reduce consumer acceptance, resulting in a significant portion of vehicle travel remaining human-driven even after market saturation.

Significantly faster implementation would require much faster development, deployment, and fleet turnover than previous vehicle technologies. For example, for the majority of vehicle travel to be autonomous by 2035, most new vehicles purchased after 2025 would need to be autonomous. New vehicle purchase rates would need to triple allowing the fleet turnover process that normally takes three decades to occur in one. This would require most low- and middle-income motorists, who normally purchase used vehicles or cheaper new models, to spend significantly more to purchase an automobile with self-driving capability. As a result, many otherwise functional vehicles be scrapped just because they lack self-driving capability.

Planning Implications

Autonomous vehicle implementation is just one of several factors likely to affect future transport demands and costs, as illustrated in Figure 3. Demographic trends, changing consumer preferences, price changes, improving transport options, improved user information, and other planning innovations will also influence how and how much people drive. These may have greater planning impacts than autonomous vehicles, at least until the 2040s.

Figure 3—Factors Affecting Transport Demands and Costs

Autonomous vehicles are one of many factors that will affect transport demands and costs in the next few decades, and not necessarily the most important.

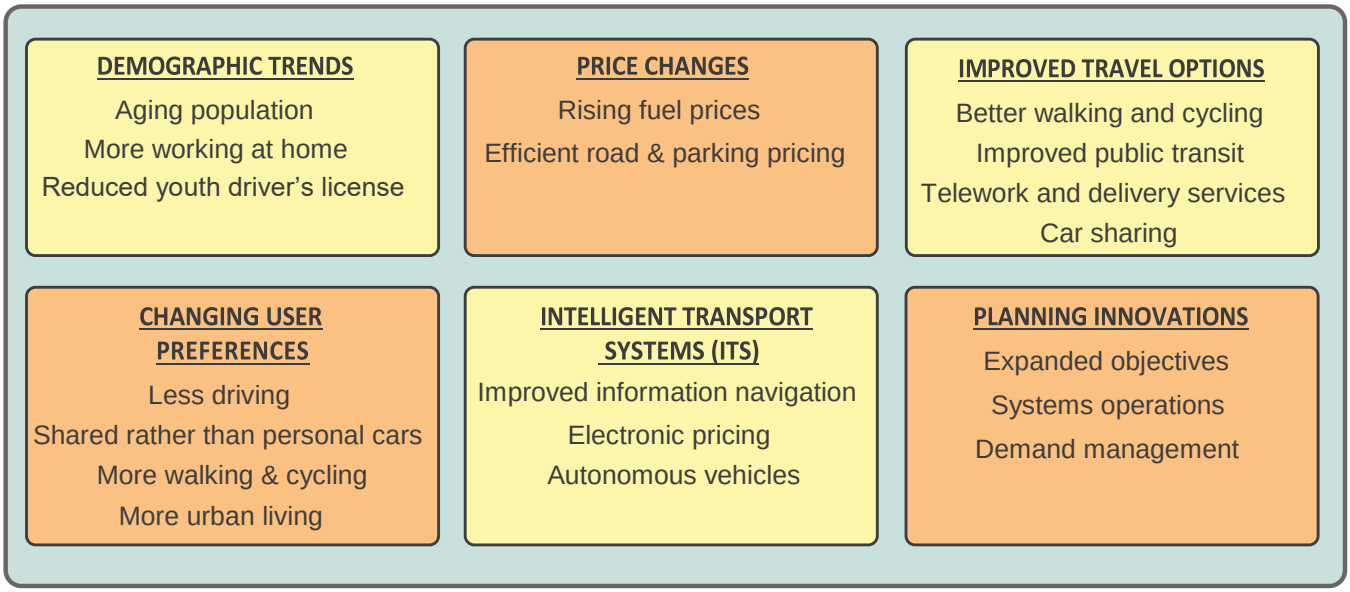


Table 8 summarizes the functional requirements and planning implications of various autonomous vehicle impacts and their expected time period based on Table 5 projections. This suggests that during the 2020s and 2030s, transport planners and engineers will be primarily concerned with defining autonomous vehicle performance, testing, and reporting requirements for operation on public roadways. If several years of testing demonstrate autonomous vehicle benefits, transport professionals may support policies that encourage or require self-driving capability in new vehicles.

Parking requirements may be reduced when AVs can provide convenient and inexpensive taxi and carsharing services, reduce the need for conventional public transit services, allow more households to rely on such services, and reduce vehicle ownership. However, modeling by the International Transport Forum indicates that self-driving taxis and public transit services are complements rather than substitutes. Transit is more efficient at serving many peak period urban trips which would significantly reduce the self-driving taxi fleet size and costs.

Some benefits (higher traffic speeds, reduced congestion, and automated intersections) require dedicated autonomous vehicle lanes. This will raise debates about fairness and cost efficiency, and human drivers may be tempted to use such lanes. For example, following a platoon of self-driving vehicles would introduce new risks, regulations, and enforcement requirements, probably starting in the 2030s.

Table 8—Autonomous Vehicle Planning Impacts By Time Period			
Impact	**Functional Requirements**	**Planning Impacts**	**Time Period**
Become legal	Demonstrated functionality and safety	Define performance, testing, and data collection requirements for automated driving on public roads.	2015-25
Increase traffic density by vehicle coordination	Road lanes dedicated to vehicles with coordinated platooning capability	Evaluate impacts. Define requirements. Identify lanes to be dedicated to vehicles capable of coordinated operation.	2020-40
Independent mobility for non-drivers	Fully autonomous vehicles available for sale	Allows affluent non-drivers to enjoy independent mobility.	2020-30s
Automated carsharing/taxi	Moderate price premium. Successful business model.	May provide demand response services in affluent areas. Supports carsharing.	2030-40s
Independent mobility for lower-income	Affordable autonomous vehicles for sale	Reduced need for conventional public transit services in some areas.	2040-50s
Reduced parking demand	Major share of vehicles are autonomous	Reduced parking requirements.	2040-50s
Reduced traffic congestion	Major share of urban peak vehicle travel is autonomous.	Reduced road supply.	2050-60s
Increased safety	Major share of vehicle travel is autonomous	Reduced traffic risk. Possibly increased walking and cycling activity.	2040-60s
Energy conservation and emission reductions	Major share of vehicle travel is autonomous. Walking and cycling become safer.	Supports energy conservation and emission reduction efforts.	2040-60s
Improved vehicle control	Most or all vehicles are autonomous	Allows narrower lanes and interactive traffic controls.	2050-70s
Need to plan for mixed traffic	Major share of vehicles are autonomous.	More complex traffic. May justify restrictions on human-driven vehicles.	2040-60s
Mandated	Most vehicles are autonomous and large benefits are proven.	Allows advanced traffic management.	2060-80s

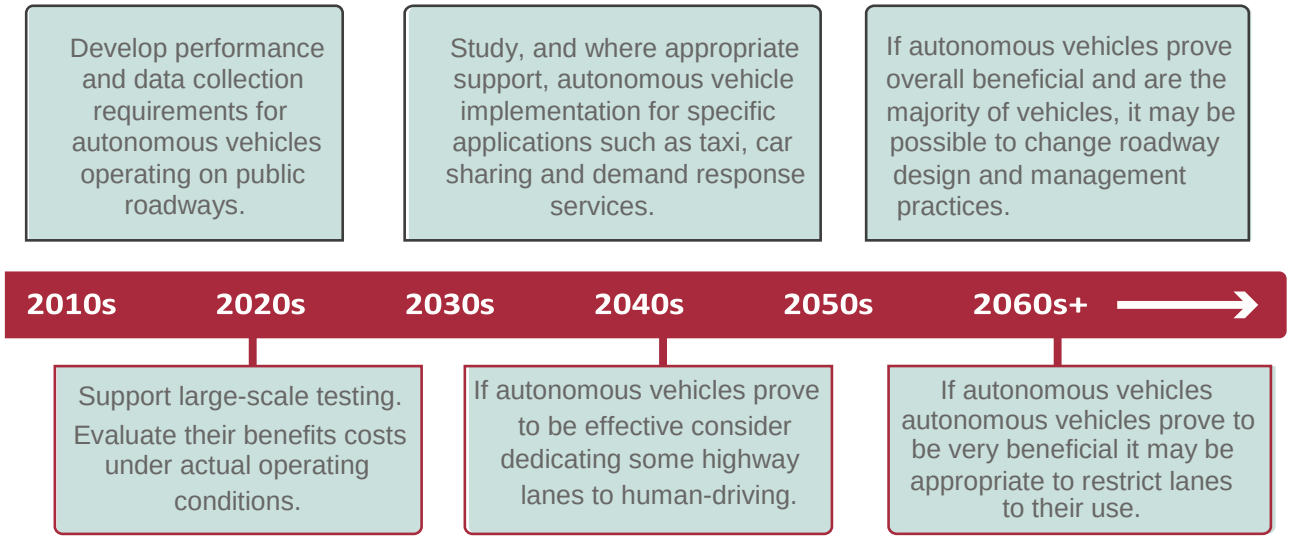
Autonomous vehicles will have various impacts on transportation planning.

When autonomous vehicles become a major share of total vehicle travel they may significantly reduce traffic risk and congestion, and parking problems, while providing some energy savings and emission reductions. Transportation professionals will be involved in technical analyses to determine their actual benefits and policy debates concerning whether public policies should encourage or require autonomous vehicles.

These impacts may vary geographically, with more rapid implementation in areas that are more affluent (residents can more quickly afford autonomous vehicles), more congested (potential benefits are greater), and have more public support.

The timeline in Figure 4 summarizes autonomous vehicle planning impact projections.

Figure 4—Autonomous Vehicle Planning Impacts Timeline



This timeline summarizes how autonomous vehicles are likely to impact transport planning.

An Analogy: Automated Banking Services

Personal computers first became available for purchase during the 1970s, the Internet went public in the 1980s, automated teller machines (ATMs) became common in the 1990s, most households were using the Internet for personal business activities by the 2000s. Similarly, banks have encouraged customers to use central call centers rather than local offices to answer questions for decades, yet these technologies have not eliminated the need for local banks with human tellers.

Automated banking can reduce the number of branch offices and employees, but customers often prefer to interact with human tellers because it can be faster and less frustrating, and therefore, more productive than automated, Internet, or telephone options. Automation has had evolutionary rather than revolutionary impacts on bank activities. Other trends—banking services, changing regulations, and management practices—have equal or greater impacts on bank infrastructure planning.

Autonomous vehicle implementation will probably follow similar patterns. Deployment will take several decades, is unlikely to totally displace current technology, will have costs as well as benefits, and will only marginally affect infrastructure planning for the foreseeable future. It is one of several current trends likely to affect road, parking, and transit demands, and these changes will probably occur gradually over several decades.

Conclusions

Recent announcements that autonomous vehicles have safely driven hundreds of thousands of miles and that major manufactures aspire to soon sell such vehicles coupled with optimistic predictions of their benefits, have raised hopes that this technology will soon be widely available and solve many transportation problems. However, there are good reasons to be cautious when predicting their future role.

There is considerable uncertainty concerning autonomous vehicle benefits, costs, and travel impacts. Advocates claim that they will provide large benefits that offset costs, but will require additional equipment, services, and maintenance costs that will likely total hundreds or thousands of dollars per vehicle-year. Moreover, many of their benefits are unproven.

Current automated vehicles can only self-drive under limited conditions. Significant technical and economic obstacles must be overcome before most households can rely on AVs for daily travel. Operating a vehicle on public roads is more complex than flying an airplane due to the frequency and proximity of interactions with often unpredictable objects, including other vehicles, pedestrians, animals, buildings, trash, and potholes. If AVs follow previous vehicle technology deployment patterns, autonomous vehicles will initially be costly and imperfect. During the 2020s and perhaps the 2030s, autonomous vehicles are likely to be expensive novelties with limited abilities, such as restrictions on the road conditions in which they may operate. It will probably be the 2040s or 2050s before middle-income families can afford to own self-driving vehicles that safely operate in all conditions, and even longer before used autonomous vehicles become affordable to lower-income households. A significant portion of motorists may resist such vehicles, just as some motorists prefer manual transmissions, resulting in mixed traffic that creates new roadway management problems.

Vehicle innovations tend to be implemented more slowly than other technological changes due to their high costs, slow fleet turnover, and strict safety requirements. Automobiles typically cost 50 times as much and last ten times as long as mobile phones and personal computers. As such, consumers seldom purchase new vehicles just to obtain a new technology. Autonomous vehicles will likely have relatively costly equipment and service standards, similar to airplanes, which may discourage some users. Large increases in new vehicle purchases and scrappage rates would be required for most vehicles to be autonomous before 2050.

Self-driving taxi costs are likely to range between carsharing ($0.60-1 per mile) and human driven taxis ($2-3 per mile), depending on factors, such as their cleaning costs. This will make them a cost-effective alternative to owning lower mileage (5,000 annual miles) vehicles. However, many motorists are likely to prefer owning personal vehicles for prestige and convenience sake. As a result, shared autonomous vehicles are likely to reduce vehicle ownership mostly in compact, multimodal urban areas, and will have little effect in suburban and rural areas.

Advocates may exaggerate net benefits by ignoring new costs and risks, offsetting behavior (the tendency of road users to take additional risks when they feel safer), rebound effects (increased vehicle travel caused by faster travel or reduced operating costs, which may increase external costs), and harms to people who do not to use the technology, such as reduced public transit service. Benefits are sometimes double-counted by summing increased safety, traffic speeds, and facility savings, although there are trade-offs between them.

Transportation professionals (planners, engineers, and policy analysts) have important roles in autonomous vehicle development and deployment. We can help support their development and testing, and establish performance standards to legally operate on public roads. If such vehicles perform successfully and become common, they may affect planning decisions, such as the supply, design, and operation of roadways, parking, and public transit. To be prudent, such infrastructure changes should only occur after autonomous vehicle benefits, affordability, and public acceptance are fully demonstrated. This may vary—autonomous vehicles may affect some roadways and communities more than others.

A critical question is whether autonomous vehicles increase or reduce total vehicle travel and associated external costs. It could go either way. By increasing travel convenience and comfort, and allowing vehicle travel by non-drivers, total vehicle mileage could be increased. Conversely, carsharing may also be facilitated, which allows households to reduce vehicle ownership and total driving. This review suggests that they will probably increase total vehicle travel unless implemented with offsetting policies, such as efficient road and parking pricing.

Another critical issue is the degree to which potential benefits can be achieved when only a portion of vehicle travel is autonomous. Some benefits, such as improved mobility for affluent non-drivers, may occur when autonomous vehicles are uncommon and costly, but many potential benefits require that most or all vehicles on the road operate autonomously. For example, it seems unlikely that traffic densities can significantly increase, traffic lanes be narrowed,

parking supply be significantly reduced, or traffic signals be eliminated until most vehicles on affected roads are capable of self-driving.

A key public policy issue is how much this technology may harm people who do not use such vehicles—for example, if traffic volumes increase, walking and cycling conditions are degraded, conventional public transit service declines, or human-driven vehicles are restricted. Some strategies, such as platooning, may require special autonomous vehicle lanes to achieve benefits. These issues will likely generate considerable debate over their merit and fairness.

Summary

The selected references and excerpts above were pulled from just a few of the research documents collected for this report (a full bibliography is provided at the end). However, several common themes emerged through these expert perspectives.

- The importance of adopting a multi-modal strategy.
- An assumption of significant parking demand reductions once AVs become common place.
- General agreement that full AV implementation (and the anticipated parking demand reductions) are 20-30 years away.
- An acknowledgment that parking structures are designed for 50-75 year lifecyles and that any parking structures being built should consider new design approaches that consider adaptive reuse.
- The importance of considering changes in the millennial generation's travel preferences.
- The importance and impact of shared-use mobility options to provide a full range of mobility options.
- The importance of effective parking management that leverages new technologies to create improved user experiences.

Shared Mobility and "Mobility as a Service"

Information and communication technologies, combined with smartphone applications and location data from global positioning systems, are making feasible transportation services that have long been imagined but never realized on a large scale. These innovations include: carsharing, bikesharing, microtransit services, and most notably, transportation network companies (TNCs), such as Uber and Lyft.

These services are being embraced by millions of travelers who are using their smartphones to arrange for trips by car, shuttle, and public transit, as well as for short-term rental of cars and bicycles. These new services epitomize today's sharing economy and allow an increasing number of people to enjoy the mobility benefits of an automobile without owning one. They may also encourage others to leave their personal vehicle at home for the day, reduce the number of vehicles in their household, or even forgo having one at all.

The Transportation Research Board (TRB) recently released *Special Report 319: Between Public and Private Mobility: Examining the Rise of Technology-Enabled Transportation Services*. This report was developed by a special task force of transportation experts from industry and academia, and identified a range of research needs.

A copy of the report can be downloaded at: http://onlinepubs.trb.org/onlinepubs/sr/sr319.pdf

In a separate but related publication, Xerox's Innovator's *Brief for the Transportation Industry* recently presented "A Three Point Plan to Improve Urban Mobility". This brief highlights the fact that cities are going to get a lot more crowded. Today, 54% of the world's population lives in urban areas. The United Nations estimates that an additional 2.5 billion people could be based in cities by 2050. As our world becomes more urbanized, the issues of traffic congestion, parking, and access management are amplified. Xerox's brief focuses on three key points that can empower cities to be more sustainable and improve the quality of life for residents and tourists.

1. **Improve the efficiency of existing mobility infrastructure.**

   Adding more infrastructure is simply not an option in many urban environments. Using technology, we can move people, vehicles, and goods more efficiently through the existing infrastructure.
2. **Increase the capacity of the existing mobility infrastructure.**

   The goal here is to move more people, vehicles, and goods through the existing infrastructure.
3. **Change the behaviors of urban travelers.**

   This is about influencing the choices that travelers make toward options that reduce congestion. Agencies that implement dynamic pricing can reduce traffic congestion in all electronic toll collection and/or on-street parking situations, using pricing as a mechanism to influence driver choices. Smart parking programs help to increase space availability and reduce pollution by helping drivers get to a parking spot at their desired price point sooner. Incorporating telecommuting into the office culture helps to keep people and vehicles off the roads during the day. Providing accessible multimodal options such as ridesharing, car sharing, and public transportation via mobility apps creates opportunities to make different choices that can result in less personal vehicle usage and less congestion.

Both of these publications reinforce the integration of parking and mobility management strategies into a more comprehensive and connected platform of transportation choices.

The following section illustrates how far we have come in the evolution of shared mobility resources and options. The following list was created for the Silicon Valley "Mobility as a Service" project, where mobility aggregators integrated various services. It maps out the ecosystem of shared mobility options using the following major categories. For each category of shared mobility elements, examples of software or programs are provided.

- Enterprise Commute Trip Reduction (e.g., Luum, Ride Amigos)
- Mobility Aggregators (e.g., Moovit, Moovel, Urban Engines)
- Public Transit (e.g., bus, subway)
- Private Sector Transit (e.g., Bridj, Chariot, Go Carma, Via)
- Rideshare w/in 10 min (e.g., Lyft Carpool, UberPool, Ford Dynamic Social Shuttle)
- Rideshare w/in 24 hours (e.g., Carma, HOVee Carzac)

- Taxi-like services (e.g., Lyft, Uber, Juno, Sidecar)
- Carshare (e.g., Car2Go, Zipcar, Enterprise Car Share)
- P2P Carshare (e.g., Getaround, RelayRides, Ford Car Swap)
- Bikeshare (e.g., Motivate, DecoBike, Bcycle, NextBike)
- Personal Electric Transport (e.g., Enzo foldable ebike, GenZe electric bikes, Scoot (heavy scooter rental)) • Vanpooling (e.g., Enterprise, Vride)
- Commute Mode Detection Technologies (e.g., Strava, MapMyRide, Moves)
- Smartphone Transit Payment (e.g., Passport, GlobeSherpa, Masabi)
- Smartphone Parking (e.g., ParkMe, Parkmobile, Pay-by-Phone)
- Miscellaneous Apps (e.g., City Mapper, Transitscreen, Modify—TDM Trip Planner)
- Commuter Benefits (e.g., Commuter Check Direct,Commuter Benefits, Wageworks)
- Robotaxi (e.g., Uber with Robot Driver)
- Personal Rapid Transit (e.g., 2getthere, Ultra Global (London Heathrow))
- Niche Ride Match (e.g., Zimride, Otto (eRide Share))
- SOV Apps (e.g., WAZE Social Traffic, Twist for Rendezvous)
- Niche Transport (Ee.g., Boost by Benz, Shuddle, Hop/Skip/Drive)

This document illustrates the scope, variety, and evolution of this emerging industry area called “shared mobility” as parking and TDM programs merge to offer more comprehensive tapestries of access management strategies. Looking at this document from a different perspective reveals another dimension. Beyond the specific practices, there are broader categories—such as mobile communications, data aggregation, commute mode detection, personal transport, active transportation, private sector transit, and commuter benefits—that are driving the innovation of new approaches. In some cases, the intersections of these broader categories are generating synergistic applications and approaches that will have the potential to be both transformative and disruptive to our industry.

The promise and potential of these evolving products, applications, and strategies on our ability to improve access and mobility while simultaneously addressing other important issues—such as congestion mitigation, greenhouse gas emission reduction, and the promotion of a more sustainable transportation network—is exciting. Kimley-Horn believes it will be the City’s best interest to assess these emerging transportation options and invest in a comprehensive access management program that can improve visitor, employee and staff experiences as an integrated downtown parking and access development strategy.

Parking and Mobility Management: Monitoring and Evaluation

Creating a baseline of parking and transportation utilization and tracking the subsequent changes will be critical to planning for future parking, especially when considering the uncertain future of the transportation sector and the potential for significantly reduced parking needs (due to autonomous vehicles and other transportation usage trends).

Following are Kimley-Horn's recommendations for implementation within the first six months of operations:

1. Develop an automated system of documenting the number of campus employees by:

    a. Number of employees by tenant/institution.

    b. Number of employees by tenant/institution/by shift.

2. On an annual basis, conduct a "cordon count" in conjunction with a parking utilization survey. Cordon counts are counts taken at each campus access point or peripheral campus intersection while documenting the types of vehicles and their respective volumes. Kimley-Horn has had recent success conducting "cordon counts" using video which allows the surveyor to obtain specific numbers by type for each access point (cars/buses/bikes/peds). This data can also be useful to assess traffic conditions.

3. Define specific modal split targets as parking demand reduction strategy and provide ongoing monitoring. The graphic below shows a potential application of various parking demand reduction strategies along with their estimated parking demand reduction goals.

By clearly stating your parking demand reduction goals and mapping out the intended strategies, a logical TDM implementation and monitoring process can be created. The keys to success in this process are:

- Assign anticipated percentages to meet the overall demand reduction goals.
- Gather valid baseline data for comparative analysis.
- Develop effective performance measures related to each TDM program element.
- Implement an ongoing tracking and reporting process to measure progress.

Designing for Flexibility and Adaptive Reuse

Given the uncertain future of transportation and parking discussed in the previous chapters (particularly the potential for dramatic parking demand reductions) the question of whether a parking structure be designed today and adapted into something different tomorrow takes on a new significance. Thinking critically from an operational and design perspective, two key concepts emerge related to forward-thinking parking planning—developing strategies that promote maximum operational flexibility in short- to mid-term time frame, and designing future parking infrastructure with the capability of being adaptively reused should projections related to reduced parking demand prove to be on-target.

Planning for the Adaptive Reuse of Parking Structures

This report section explores the technical issues associated with the concept of adaptive reuse parking facilities. Designs must consider future direction of the industry, including:

- Migration of suburbanites to urban centers
- Millennials driving less and forgoing car ownership
- Car sharing services (e.g., Uber, Lyft, Zipcar)
- Connected and autonomous vehicles
- The drive towards reducing vehicular traffic and making communities becoming more pedestrian-friendly and walkable

Many communities are taking measures to meet the evolving parking and transportation needs of communities of today and of the future. For example, forward-thinking administrators are revising their zoning codes and moving away from the minimum to maximum parking ratios for selected land uses. In addition, most are recognizing reduction in parking demand for transit-oriented development (TODs) and shared-use parking.

Most people would agree that the need for parking structures is not going to go away anytime soon, even as technology is rapidly changing. Parking may not be the most glamorous element of a development or community but many community planners and developers recognize that when done right, it is the key to realizing their vision for an active and vibrant community and a successful development.

The service life of many parking structures designed is 50-75 years. As such, these facilities are and will continue to be fixtures of our urban landscape. We realize that mobility options and preferences are going to change over time as are the needs of the community. The last thing anyone wants is to build a structure that will be obsolete or severely underutilized.

What if parking structures could be designed to not only handle the current need but also be adaptable to better meet the evolving parking and transportation needs of communities in the future? What if we could future-proof the parking structure of today and design them to be adaptable to become say a community mobility hub, a community event center, or other land use types (office, clinical space, residential, etc.). Can this be done physically and economically?

We believe it can. It may also be possible for an existing structure to be retrofitted to a degree. Some would argue that it would be simpler and less costly to demolish the existing parking structure and replace it with a new, more suitable building. In some circumstances, and for many owners considering the long-term, this may not be the most environmentally responsible or cost-effective choice.

How do we go about doing this in a creative and economical way?

What should we consider and do today to allow parking structures to be multi-functional and adaptable in the future?

First, let's define the design challenge. Parking structures are unique building types with the following typical features:

- Open to the environment
- Designed to be storage facilities (Group S Occupancy), not conditioned, occupied spaces
- More horizontal than vertical in configuration

The primary focus of parking structure design has been to efficiently move cars in, store them, then move them out. In contrast, buildings for non-parking uses focus on making the occupied space safe, habitable, appealing, and accessible. There are a number of parking structure design features that don't lend themselves to a non-parking use, including:

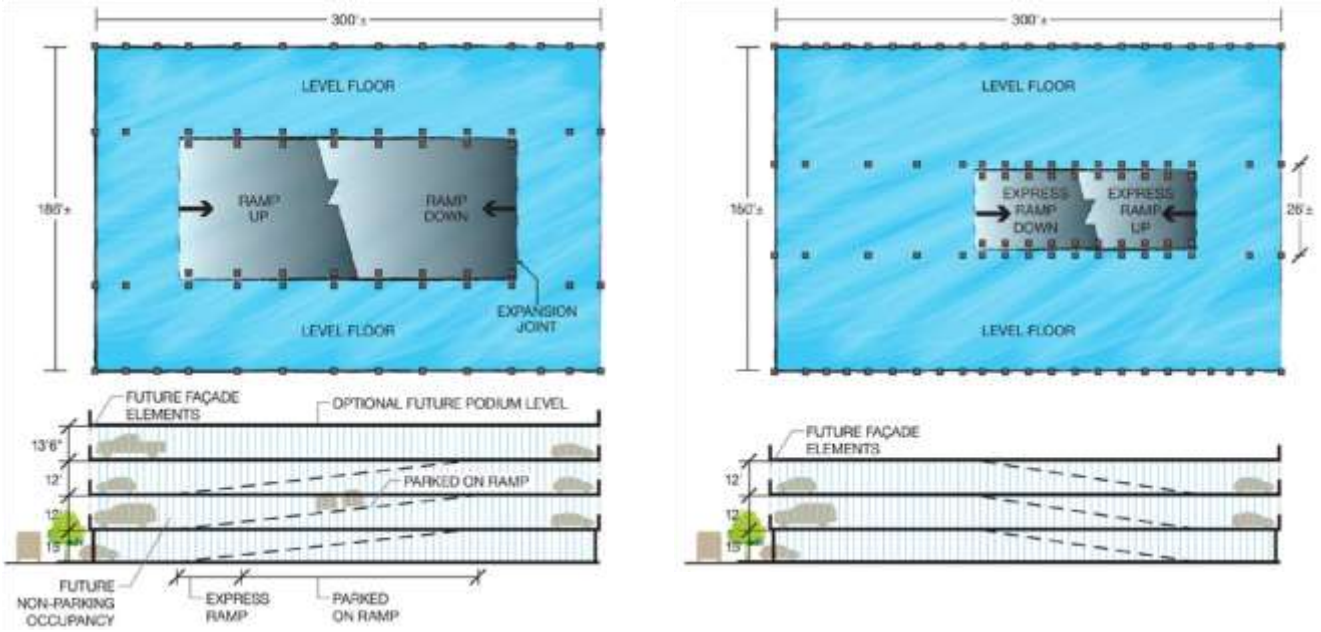
- Story (or floor-to-floor) heights. Parking structure story heights generally range between 10' 0" and 11' 6" which are not suitable for most commercial office/retail or residential use
- Sloped floors. Parking structures require sloped floors to facilitate self-parking vehicular circulation between parking levels and for drainage
- **Size, number, and layout of stairs and elevators.** Stairs are a means of egress for life safety and sized based on code prescribed occupant load factor associated with an occupancy use classification. For parking structures, the occupant load factor is 200 SF per person whereas office (Group B) and mercantile (Group M) occupancy at 100 and 60 SF person, respectively, resulting in the requirement for wider stair widths and/or additional stairs. These stairs and accompanying elevators are typically located along the perimeter of the parking structure whereas for non-parking use buildings they are typically located within the interior of the building footprint.
- **Lack of HVAC systems.** These systems are not provided for parking floor areas.
- Lack of fire protection. Many jurisdictions don't require parking structures to have fire sprinklers for fire protection whereas they are typically required for non-parking uses.
- **Lower live loading code.** The minimum code for live loading parking structures is 40 psf. For other uses such as office, retail, library reading rooms, public meeting spaces, and their corridors are between 50 and 100 psf.

Key Parking Structure Adaptive Reuse Strategies

What can be done differently when planning for and designing parking structures of the future to compensate for these conflicting design features?

- Increase floor-to-floor heights. By increasing the first story height minimum to 15 feet and the height of typical upper stories to 12 feet, the resulting first story height can be a minimum of 15 feet and the height of typical upper stories can be 12 feet. These heights are more suitable to provide higher clear heights of 12± feet for ground level commercial/retail use and 9± feet for office, community meeting, or possibly residential use. If sufficient site length is not available to provide a parked-on ramp with these story heights or more flat floor area is desired then non-parked on express ramps (with slope > 6.67%) can be provided for a portion or the entire length of ramp. These ramps can be situated near ends of the floor plate or along its sides to provide for more flat floor area.
- Design the floor framing to allow for the ramped parking bay to be more readily demolished. One way of accomplishing this is to provide double row of columns along the bay with the ramp and expansion/construction joints at the top and bottom of each floor-to-floor ramp segment. This would likely require additional framing elements for lateral load resistance and detailing to facilitate load transfer and accommodate building movement at the expansion/construction joints. While this would also add to the initial construction costs, it would provide an opportunity for modifying each floor to be a complete flat floor plate for future uses.
- Include 25-30-feet wide light-well between parking bays to provide space for construction of additional elevator and stair cores and flat floor construction for corridors within the interior of the building footprint. Foundations for these future pedestrian circulation elements could be constructed as part of the initial construction.
- The perimeter stair and elevator cores that serve the parking structure could be located outboard to the floor plate. This will allow for easier demolition of these elements if they don't adequately serve the alternate use.
- Design floor framing for additional load carrying capacity by including provision for adding columns and beams to reduce beam and slab spans or supplement conventional and post-tensioned slab and beam reinforcement to support additional floor loads. This additional load carrying capacity could accommodate a topping slab to level out the floor drainage slope.
- Impacts of floor cross slope for drainage can be reduced by providing additional floor drains.

- Building columns, walls, and foundations could be designed to accept vertical expansion and the addition of a podium level for a public plaza recreational space or a one- or two-story light-framed (Type 5 framed wood construction) building structure.
- Design for either the removal of perimeter vehicle and pedestrian guard rails or detail connections points to accept future installation of building facade elements (e.g., curtain wall/store front system, panelized EIFS, or stucco wall system), including doors and windows to fully enclose the perimeter of the structure.
- Provide additional capacity in the electrical service, sanitary sewer, and fire protection systems. Include provisions for electrical and mechanical chases to accommodate duct work and cabling, and additional space for mechanical and electrical service and fire protection equipment (e.g., fire pumps and emergency generators).



Additional structural and architectural consideration may need to be identified based on the whether the parking structure is cast-in-place concrete, precast concrete, or steel framed construction.

We recognize that not all projects will lend themselves for implementing design enhancement for facilitating future adaptive reuse but for some projects and owners, it may be beneficial to investigate the possibilities during project planning and design development. Parking structures designed to accommodate future conversion to a different use will cost more initially. The economic decision to proceed will need to be considered by community and institutional leaders and owners to determine the feasibility of such an investment.

Advancing the Concept of Parking Structure Adaptive Reuse

Given the potential of this concept and its specific relevance to the new Druid Hills healthcare campus we have attempted to advance this concept further by exploring the following key areas below:

- Preliminary Building Code Review (comparative analyses of different uses and occupancy classifications)
- The Development of Prototype Design Concepts
- Estimates of Probable Cost for Prototype Concept Designs

Preliminary Code Review

We conducted a preliminary code review of the 2012 International Building Code (2012 IBC) for the near term and potential building uses to identify the basic requirements that need to be addressed in our design concepts. Each building or portion of a building is assigned a single occupancy classification based on its intended use. Occupancy classifications reviewed include parking structure use (Group S occupancy), professional office use (Group B occupancy), mercantile use (Group M occupancy), and residential use (Group R occupancy). Tables 1, 2, and 3 present results of this code review.

TABLE 1—Preliminary Code Review
Comparison of Group S and Group M Occupancy Requirements

2012 IBC Code Section	Parking Structure Use: Group S-2 Occupancy	Retail Use: Group M Occupancy
Chap 4 – 406.4.1 Chap 12 – 1208.2	Minimum clear height is 7’-0”	Minimum ceiling height in habitable spaces and corridors is 7’-6”
Chap 4 – 406.4.3	Vehicle barriers minimum 2’-9” in height	
Chap 4 – 406.5 Chap 5 – 705.8	Openings for natural ventilation purposes: Uniformly distributed openings on two or more exterior sides. The area of such openings in exterior walls on a tier must be at least 20% of the total perimeter wall area of each tier. The aggregate length of the openings considered to be providing natural ventilation shall constitute a minimum of 40% of the perimeter of the tier.	Maximum allowable area of unprotected and protected opening is a function of the fire separation distance from property line. Refer to Table 705.8
Chap 5 – 508; 510 Chap 6 – 601; 602	Noncombustible Type 1 or Type 2	Noncombustible Type 1 or Type 2
Chap 4 – 406.5.5 Chap 5 – 503; 504.2; 506; 508.4	Maximum height allowable; area per tier; and maximum number of stories Type 1A – unlimited; unlimited; unlimited Type 1B – 160 feet; unlimited; 12 stories Type 2A – 85 feet; 78,000 SF; 6 stories Type 2B – 75 feet; 52,000 SF; 4 stories	Maximum height allowable; area per tier; and maximum number of stories Type 1A – unlimited; unlimited; unlimited Type 1B – 160 feet; unlimited; 12 stories Type 2A – 85 feet; 43,000 SF; 5 stories Type 2B – 75 feet; 25,000 SF; 3 stories
Chap 5 – 508.4, 510	Horizontal separation with assembly having fire-resistance rating of not less than 3 hours between separated occupancies	Horizontal separation with assembly having fire-resistance rating of not less than 3 hours between separated occupancies

Chap 7 – 706.4; 707; 708	Fire wall resistance rating – 2 hours Fire barrier assemblies – 2 hours Fire partition walls – 1 hour	Fire wall resistance rating – 3 hours Fire barrier assemblies – 2 hours Fire partition walls – 1 hour
Chap 9 – 903	Generally, not required in tiers classified as open for natural ventilation in mixed-use S-2 open parking structures unless required by local jurisdiction.	Required where one of the following conditions exists: Fire area > 12,000 SF fire area 3+ stories above-grade Total fire areas (all floors) > 24,000 SF Furniture/mattress sale area > 5,000 SF
Chap 9 – 905	Class I standpipes allowed with automatic sprinkler system	Class I standpipes allowed with automatic sprinkler system
Chap 9 – 907	Fire alarms and detection systems – not required	Manual fire alarm system required where one of the following conditions exists: Combined occupant load ≥ 500 Occupant load > 100 above or below the lowest level of exit discharge *Exception: When an automatic sprinkler system is installed and* occupant notification appliances activate upon sprinkler use.
Chap 10 – 1004	Occupant load = 200 SF gross per occupant	Occupant load = 60 SF gross per occupant. Basement and grade floor areas = 30 SF gross per occupant. Storage, stock, shipping areas = 300 SF per occupant
Chap 10 – 1005	Stair egress width [in.] = 0.2*occupant load (with automatic sprinkler system)	Stair egress width [in.] = 0.2*occupant load (with automatic sprinkler system)
Chap 10 – 1007	Area of refuge not required in stairways in open parking structures	Area of refuge not required at stairways in building with automatic sprinkler system
Chap 10 – 1016	Maximum travel distance to egress stair with sprinkler system = 400 feet	Maximum travel distance to egress stair with sprinkler system = 250 feet
Chap 16 – 1604	Risk Category II	Risk Category II

Chap 16 – 1607	Live load = 40 psf	Live load first/ground floor = 100 psf Live load upper floors = 75 psf
Chap 29 – 2902	Plumbing fixtures not required	Minimum # of plumbing fixtures: Water Closets: 1 per 500 occupants Lavatories: 1 per 750 occupants Drinking fountains: 1 per 1,000 occupants

TABLE 2—Preliminary Code Review Comparison of Group S and Group B Occupancy Requirements		
2012 IBC Code Section	**Parking Structure Use: Group S-2 Occupancy**	Professional Office Use: Group B Occupancy
Chap 4 – 406.4.1 Chap 12 – 1208.2	Minimum clear height is 7'-0"	Minimum ceiling height in habitable spaces and corridors is 7'-6"
Chap 4 – 406.4.3	Vehicle barriers minimum 2'-9" in height	
Chap 4 – 406.5 Chap 5 – 705.8	Openings for natural ventilation purposes: Uniformly distributed openings on two or more exterior sides. The area of such openings in exterior walls on a tier must be at least 20 % of the total perimeter wall area of each tier. The aggregate length of the openings considered to be providing natural ventilation shall constitute a minimum of 40 % of the perimeter of the tier.	Maximum allowable area of unprotected and protected opening is a function of the fire separation distance from property line. Refer to Table 705.8
Chap 5 – 508; 510 Chap 6 – 601; 602	Noncombustible Type 1 or Type 2	Noncombustible Type 1 or Type 2
Chap 4 – 406.5.5 Chap 5 – 503; 504.2; 506; 508.4	Maximum Height; Allowable area per tier; and maximum number of stories Type 1A – unlimited; unlimited; unlimited Type 1B – 160 feet; unlimited; 12 stories Type 2A – 85 feet; 78,000 SF; 6 stories Type 2B – 75 feet; 52,000 SF; 4 stories	Maximum Height; Allowable area per tier; and maximum number of stories Type 1A – unlimited; unlimited; unlimited Type 1B – 160 feet; unlimited; 12 stories Type 2A – 85 feet; 75,000 SF; 6 stories Type 2B – 75 feet; 46,000 SF; 4 stories
Chap 5 – 508.4, 510	Horizontal separation with assembly having fire-resistance rating of not less than 3 hours between separated occupancies.	Horizontal separation with assembly having fire-resistance rating of not less than 3 hours between separated occupancies
Chap 7 – 706.4; 707; 708	Fire wall resistance rating - 2hours Fire barrier assemblies – 2 hours Fire partition walls – 1 hour	Fire wall resistance rating – 3 hours Fire barrier assemblies – 2 hours Fire partition walls – 1 hour
Chap 9 – 903	Generally, not required in tiers classified as open for natural ventilation in mixed-use, S-2 open parking structures unless required by local jurisdiction.	Required when building height is greater than or equal to 55 feet
Chap 9 – 905	Class I standpipes allowed with automatic sprinkler system	Class I standpipes allowed with automatic sprinkler system
Chap 9 – 907	Fire alarms and detection systems – not required	Manual fire alarm system required where one of the following conditions exists: Combined occupant load ≥ 500 Occupant load > 100 above or below the lowest level of exit discharge *Exception: When an automatic sprinkler system is installed and* occupant notification appliances activate upon sprinkler use

Chap 10 – 1004	Occupant load = 200 SF gross per occupant	Occupant load = 100 SF gross per occupant
Chap 10 – 1005	Stair egress width [in.] = 0.2*occupant load (with automatic sprinkler system)	Stair egress width [in.] = 0.2*occupant load (with automatic sprinkler system)
Chap 10 – 1007	Area of refuge not required in stairways in open parking structures	Area of refuge not required at stairways in building with automatic sprinkler system
Chap 10 – 1016	Maximum travel distance to egress stair with sprinkler system = 400 feet	Maximum travel distance to egress stair with sprinkler system = 300 feet
Chap 16 – 1604	Risk Category II	Risk Category II
Chap 16 – 1607	Live load = 40 psf	Live load upper floors = 50 psf Live load for corridors above first floor = 80 psf Live load for lobbies and first-floor/ground floor corridors = 100 psf
Chap 29 – 2902	Plumbing fixtures not required	Minimum # of plumbing fixtures: Water closets: 1 per 25 for the first 50 occupants and 1 per 50 for the remainder exceeding 50 occupants Lavatories: 1 per 40 for the first 80 occupants and 1 per 80 for the remainder exceeding 80 occupants Drinking fountains: 1 per 100 occupants

TABLE 3—Preliminary Code Review Comparison of Group S and Group R Occupancy Requirements		
2012 IBC Code Section	**Parking Structure Use: Group S-2 Occupancy**	**Multifamily Residential Use: Group R-2 Occupancy**
Chap 4 – 406.4.1 Chap 12 – 1208.2	Minimum clear height is 7'-0"	Minimum ceiling height in habitable spaces and corridors is 7'-6"
Chap 4 – 406.4.1 Chap 12 – 1208.2	Minimum clear height is 7'-0"	Minimum ceiling height in habitable spaces and corridors is 7'-6"
Chap 4 – 406.4.3	Vehicle barriers minimum 2'-9" in height	
Chap 4 – 406.5 Chap 5 – 705.8	Openings for natural ventilation purposes: Uniformly distributed openings on two or more exterior sides. The area of such openings in exterior walls on a tier must be at least 20 % of the total perimeter wall area of each tier. The aggregate length of the openings considered to be providing natural ventilation shall constitute a minimum of 40 % of the perimeter of the tier.	Maximum allowable area of unprotected and protected opening is a function of the fire separation distance from property line. Refer to Table 705.8
Chap 5 – 508; 510 Chap 6 – 601; 602	Noncombustible Type 1 or Type 2	Noncombustible Type 1 or Type 2
Chap 4 – 406.5.5 Chap 5 – 503; 504.2; 506; 508.4	Maximum height; allowable area per tier; and maximum number of stories Type 1A – unlimited; unlimited; unlimited Type 1B – 160 feet; unlimited; 12 stories Type 2A – 85 feet; 78,000 SF; 6 stories Type 2B – 75 feet; 52,000 SF; 4 stories	Maximum height; allowable area per tier; and maximum number of stories Type 1A – unlimited; unlimited; unlimited Type 1B – 160 feet; unlimited; 12 stories Type 2A – 60 feet; 75,000 SF; 4 stories Type 2B – 60 feet; 46,000 SF; 4 stories
Chap 5 – 508.4, 510	Horizontal separation with assembly having fire-resistance rating of not less than 3 hours between separated occupancies	Horizontal separation with assembly having fire-resistance rating of not less than 3 hours between separated occupancies
Chap 7 – 706.4; 707; 708	Fire wall resistance rating – 2 hours Fire barrier assemblies – 2 hours Fire partition walls – 1 hour	Fire wall resistance rating – 3 hours Fire barrier assemblies – 2 hours Fire partition walls – 1 hour
Chap 9 – 903	Generally, not required in tiers classified as open for natural ventilation in mixed-use S-2 open parking structures unless required by local jurisdiction.	Required
Chap 9 – 905	Class I standpipes allowed with automatic sprinkler system.	Class I standpipes allowed with automatic sprinkler system.

Chap 9 – 907	Fire alarms and detection systems – not required	Manual fire alarm system required where one of the following conditions exists: Dwelling/sleeping unit is located 3+ stories above lowest level of discharge Building contains 16+ dwelling units *Exception: When an automatic sprinkler system is installed and* occupant notification appliances activate upon sprinkler use
Chap 10 – 1004	Occupant load = 200 SF gross per occupant	Occupant load = 100 SF gross per occupant
Chap 10 – 1005	Stair egress width [in.] = 0.2*occupant load (with automatic sprinkler system)	Stair egress width [in.] = 0.2*occupant load (with automatic sprinkler system)
Chap 10 – 1007	Area of refuge not required in stairways in open parking structures	Area of refuge not required at stairways in building with automatic sprinkler system
Chap 10 – 1016	Maximum travel distance to egress stair with sprinkler system = 400 feet	Maximum travel distance to egress stair with sprinkler system = 300 feet
Chap 16 – 1604	Risk Category II	Risk Category II
Chap 16 – 1607	Live load = 40 psf	Live load = 40 psf Live load for public rooms and corridors serving dwelling units = 100 psf
Chap 29 – 2902	Plumbing fixtures not required	Minimum # of plumbing fixtures: Water closets: 1 per dwelling unit Lavatories: 1 per dwelling unit Bathtubs or showers: I per dwelling unit Kitchen sink: 1 per dwelling unit Automatic clothes water connection: 1 per 20 dwelling units

Prototype Design Concepts

Concepts presented in this section have been developed under the assumption that in the near-term, this building will be a mixed-use parking structure with retail/commercial space at the street level and parking at all above-grade supported levels. In the future, portions of the building's above-grade levels would be converted to either general office or residential apartment use with the remainder of floor area used for parking.

These design concepts are not intended to address all design aspects related to future-proofing the parking structure but rather an attempt to address some key aspects to providing an adaptable parking structure. These concepts should only be considered as examples of what is possible. Additional structural, architectural, and MEP design consideration may need to be identified and addressed during design development of these concepts.

Concept 1

Concept 1 is depicted in Sheet 1A (near-term mixed-uses) and Sheet 1B (future mixed-uses) of the enclosed drawing exhibits. Key attributes of Concept 1 are summarized as follows:

CONCEPT 1A (NEAR-TERM MIXED-USES)

- Four-story building with footprint of 302 feet x 153 feet
- Total building floor area of approximately 223,260 SF which includes approximately 15,000 gross SF of ground level general retail space with a depth of approximately 60 feet
- First-story height of 15 feet and typical above-grade story height of 12 feet, building height to top of parapet of approximately 55 feet
- Single parking bay on ground level and two bays of parking on each of the above-grade levels providing approximately 431, 8.5 feet x 18 feet, 90-degree stalls. Note that this total does not account for loss of spaces due to ADA accommodations, motorcycle and bicycle parking, and utility and storage rooms.
- Single thread, non-parked on, express ramp provided along back side of building for vehicle circulation between parking levels. A single thread helix is a ramp orientation that circulates vertically one floor with each 360 degrees of revolution. This ramp has a double row of columns along its interior to allow for the ramped parking bay to be more readily demolished if it is not desired to include parking in the future mixed-use building scenario.
- Building footprint includes a 44 feet x 28 feet interior lightwell between parking bays to provide space for construction of an additional elevator and stair core, and flat floor construction for corridors within the interior of the office/residential use footprint.
- Average design parking efficiency provided is 483 SF per stall. This parking efficiency is considered poor relative to what can typically be provided (360-380 SF/per stall) with short span construction and parked on ramps. This poor parking efficiency is primarily attributed to having a non-parked on express ramp and lightwell.
- Building construction consists of conventionally reinforced (not post-tensioned) 10-inch thick cast-in-place concrete two-way flat slab with drop panels supported by reinforced concrete columns on shallow spread and wall footings. Floor framing, columns and footings are designed for increased live and dead floor loads associated with future office/ residential use on above-grade levels. Post-tensioned floor construction was not considered to allow for flexibility in the future for making penetrations to facilitate routing of MEP conduits and piping.
- Lateral loads are resisted by moment frames.
- The foundations are designed to support additional live and dead loads associated with future conversion of above-grade levels to office/residential uses.
- Catchment area per floor drain would be approximately 3,600 SF with drains located along Gridline 5. Spot floor elevation at drain locations would be on the order 8-10 inches below the floor elevation along floor exterior perimeter. This results in providing a minimum drainage cross slope of 1%.

Concept 1B (Future mix of uses)

Modifications to the near-term mixed-use concept:

- Total of approximately 48,600 gross SF of office/residential use within the upper three stories of building. The depth of office/residential space is approximately 60 feet.
- Single parking bay on ground level and the three above-grade levels and two parking bays on the top level providing approximately 293, 8.5 feet x 18 feet, 90-degree stalls. Note that this total does not account for loss of spaces due to ADA accommodations, motorcycle and bicycle parking, and utility and storage rooms. Average design parking efficiency provided is 525 SF per stall.
- An interior elevator and stair core constructed within the lightwell area providing two elevators and one stair.
- Removal of floor drains and addition of 2- to 4-inch thick lightweight concrete topping to level out the floor drainage slope on elevated levels.

- Addition of a 3-hour fire rated wall assembly along Gridline 5 to separate the parking use from the office/residential use.
- Construction of facade elements (e.g. curtain wall/store front system, panelized rainscreen, stucco wall system, etc.), including windows to fully enclose the exterior perimeter of the office/residential use floor area.
- HVAC and plumbing fixtures (water closets, lavatories, etc.) to condition and service the occupied office/residential uses.

Concept 2

Concept 2 is depicted in Sheet 2A (near-term mixed-uses) and Sheet 2B (future mixed-uses) of the enclosed drawing exhibits. Key attributes of Concept 2 as depicted are summarized as follows:

CONCEPT 2A (NEAR-TERM MIXED-USES)

- Four-story building with footprint of approximately 290 feet x 182 feet.
- Total building floor area of 254,700 SF which includes approximately 17,560 gross SF of ground level general retail space with a depth of approximately 60 feet.
- First-story height of 15 feet, typical above-grade story height of 12 feet, building height to top of parapet of 55 feet.
- Grade plus four supported levels with two bays of parking on ground level and three bays of parking on the four supported levels providing approximately 494, 8.5 feet x 18 feet, 90-degree stalls. Note that this total does not account for loss of spaces due to ADA accommodations, motorcycle and bicycle parking, and utility and storage rooms.
- Single thread, non-parked on, express ramp in switch back configuration provided along the side of building for vehicle circulation between parking levels. This ramp has a double row of columns along its interior to allow for the ramped parking bay to be more readily demolished if it is not desired to include parking in the future mixed-use building scenario.
- Building footprint includes a 28 feet x 28 feet interior lightwell between parking bays to provide space for construction of additional elevator and stair core and flat floor construction for corridors within the interior of the office/residential use footprint.
- Average design parking efficiency provided is 480 SF per stall. This parking efficiency is considered poor relative to what can typically be provided (360-380 SF/per stall) with short span construction and parked on ramps. This poor parking efficiency can primarily be attributed to having a non-parked on express ramp and a lightwell.
- Building construction consists of conventionally reinforced (not post-tensioned) 10-inch thick, cast-in-place concrete two-way flat slab with drop panels supported by reinforced concrete columns on shallow spread and wall footings. Floor framing, columns, and footings are designed for increased live and dead floor loads associated with future office/ residential use on above-grade levels. Post-tensioned floor construction was not considered to allow for flexibility in the future for making penetration to facilitate routing of MEP conduits and piping.
- Lateral loads are resisted by moment frames.
- The foundations are designed to support additional live and dead loads associated with future conversion of above-grade levels to office/residential uses.
- Catchment area of 2,700 and 3,600 SF per floor drain with drains located between Gridlines 3 and 4, and 5 and 6. Spot floor elevation at drain locations would be on the order 8- to 10-inches below the floor elevation along floor exterior perimeter. This results in providing a minimum drainage cross slope of 1%.

Concept 2B (Future mix of uses)

Modifications to the near-term mixed-use concept:

- Total of approximately 65,600 gross SF of office/residential use on the upper three stories of building. The depth of office/ residential space is approximately 120 feet.
- Two parking bays on ground level, one and one-half parking bays on three supported levels, and three parking bays on the top level provide approximately 302, 8.5 feet x 18 feet, 90-degree stalls. Note that this total does not account for loss of spaces due to ADA accommodations, motorcycle and bicycle parking, and utility and storage rooms. Average design parking efficiency provided is 560 SF per stall.
- An interior elevator and stair core constructed within the lightwell area providing two elevators and one stair.

- Removal of floor drains and addition of 2- to 4-inch thick lightweight concrete topping to level out the floor drainage slope on elevated levels.
- Addition of a 3-hour fire rated wall assembly to separate the parking use from the office/residential use.
- Construction of facade elements (e.g. curtain wall/store front system, panelized rainscreen, stucco wall system, etc.), including windows to fully enclose the exterior perimeter of the office/residential use floor area.
- HVAC and plumbing fixtures (water closets, lavatories, etc.) to condition and service the occupied office/residential uses.

Opinion of Probable Cost for Prototype Concept Designs

- Conceptual level opinions of probable cost were developed for each near-term and future mixed-use parking structure concept. The opinions of probable project costs are presented for comparative purposes in 2017 dollars for the Boise market. These costs do not include items such as land acquisition, project financing and site environmental evaluations, and owner soft costs such as site geotechnical investigations and recommendations and owner's administrative and legal costs. Escalation percentage should be established by the owner based on their assumptions as to the anticipated year of project bidding and construction.
- **Tables 4 and 5** provide an opinion of probable cost for a typical stand-alone, 4-story above-grade parking structure with long-span post-tensioned construction, 10 feet story heights, and typical facade treatments and features comparable in size to the Concept 1 and Concept 2.

TABLE 4—Typical Standalone 4-Story Above-grade Parking Structure
Concept 1

Item	Square Footage	Unit Price ($/SF)	Extension
Standalone Parking Structure	223,260	$50.00	$11,163,000
Construction Contingency (10%)			$1,116,300
Design Contingency (20%)			$2,232,600
Total	**223,600**	**$65.00**	**$14,511,900**

TABLE 5—Typical Stand-alone 4-Story Above-grade Parking Structure
Concept 2

Item	Square Footage	Unit Price ($/SF)	Extension
Standalone Parking Structure	254,700	$50.00	$12,735,000
Construction Contingency (10%)			$1,273,500
Design Contingency (20%)			$2,547,000
Total	**254,700**	**$65.00**	**$16,555,500**

Table 6 through 9 provide an opinion of probable cost for Concept 1 and Concept 2 for the near-term mixed-use and future mixed-uses concept scenarios.

TABLE 6—Concept 1A (Near-term Mixed-use) Opinion of Probable Cost			
Item	**Square Footage**	**Unit Price ($/SF)**	**Extension**
Parking Structure	208,260	$70.50	$14,682,000
Ground Level Retail Space Buildout	15,000	$65.50	$982,500
Subtotal	223,260	$70.16	$15,664,500
Construction Contingency (10%)			$1,566,450
Design Contingency (20%)			$3,132,900
Total	**223,260**	**$91.20**	**$20,363,850**

TABLE 7—Concept 1B (Future Mixed-uses) Opinion of Probable Costs			
Item	**Square Footage**	**Unit Price ($/SF)**	**Extension**
Parking Structure	208,260	$70.50	$14,682,000
Ground Level Retail	15,000	$65.50	$982,500
Build out Office/Residential Space	48,600	$104.00	$5,054,000
Subtotal	223,260	$92.80	$20,718,500
Construction Contingency (10%)			$2,071,850
Design Contingency (20%)			$4,143,700
Total	**223,260**	**$120.60**	**$26,934,050**

TABLE 8—Concept 2A (Near-term Mixed-use) Opinion of Probable Cost			
Item	**Square Footage**	**Unit Price ($/SF)**	**Extension**
Parking Structure	237,144	$70.00	$16,600,000
Ground Level Retail Space Buildout	17,560	$67.00	$1,176,500
Subtotal	254,700	$69.80	$17,776,500
Construction Contingency (10%)			$1,777,650
Design Contingency (20%)			$3,555,300
Total	**254,700**	**$90.70**	**$23,109,450**

TABLE 9—Concept 2B (Future Mixed-uses) Opinion of Probable Cost			
Item	**Square Footage**	**Unit Price ($/SF)**	**Extension**
Parking Structure	237,144	$70.00	$16,600,000
Ground Level Retail	17,560	$67.00	$1,176,500
Build out Office/Residential Space	65,560	$103.00	$6,753,000
Subtotal	254,700	$96.30	$24,529,500
Construction Contingency (10%)			$2,452,950
Design Contingency (20%)			$4,905,900
Total	**254,700**	**$125.20**	**$31,888,350**

Opinions rendered as to costs, including but not limited to, opinions as to the costs of construction and materials, are made based on RS Means square foot unit pricing and our experience, and represent our judgment as an experienced and qualified professional firm that is familiar with the industry. No solicitation or information from contractors was gathered.

Phased Parking Development Options

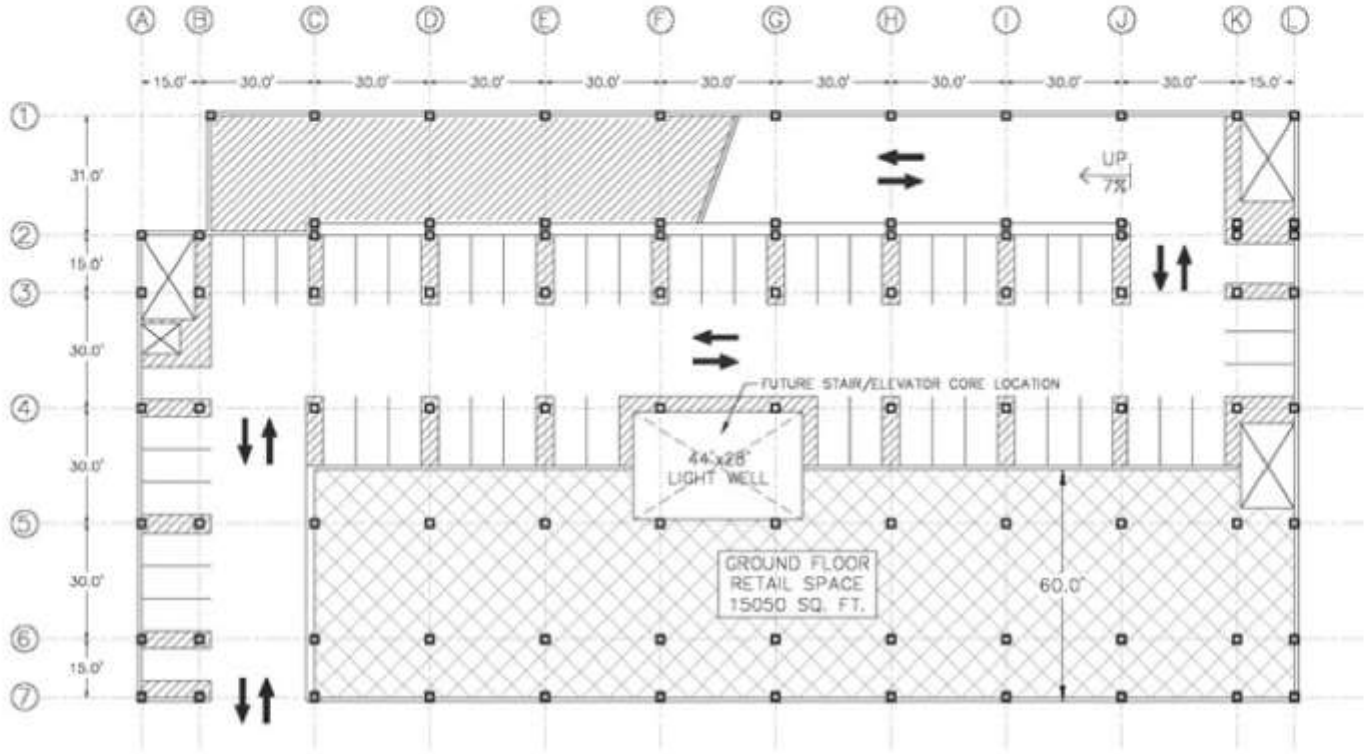
Based on the projected timeline related to the potential disruption of the current parking and transportation paradigm (e.g., autonomous vehicles, *see Chapter 4.0*), we do not anticipate a major reduction in parking demand within the Phase One development period. As such, we are recommending a phased approach to parking infrastructure development. As any new parking structure will have a design life of 50-75 years, adopting some of the strategies listed in the previous chapter could provide value even in Phase One parking development.

For parking infrastructure in the initial phases, we also recommend that these structures be designed to exceed minimum standards for ease of use. We also recommend incorporating a range of parking management best practices that will allow higher levels of service, especially for visitor and patient parking areas. This would include amenities such as:

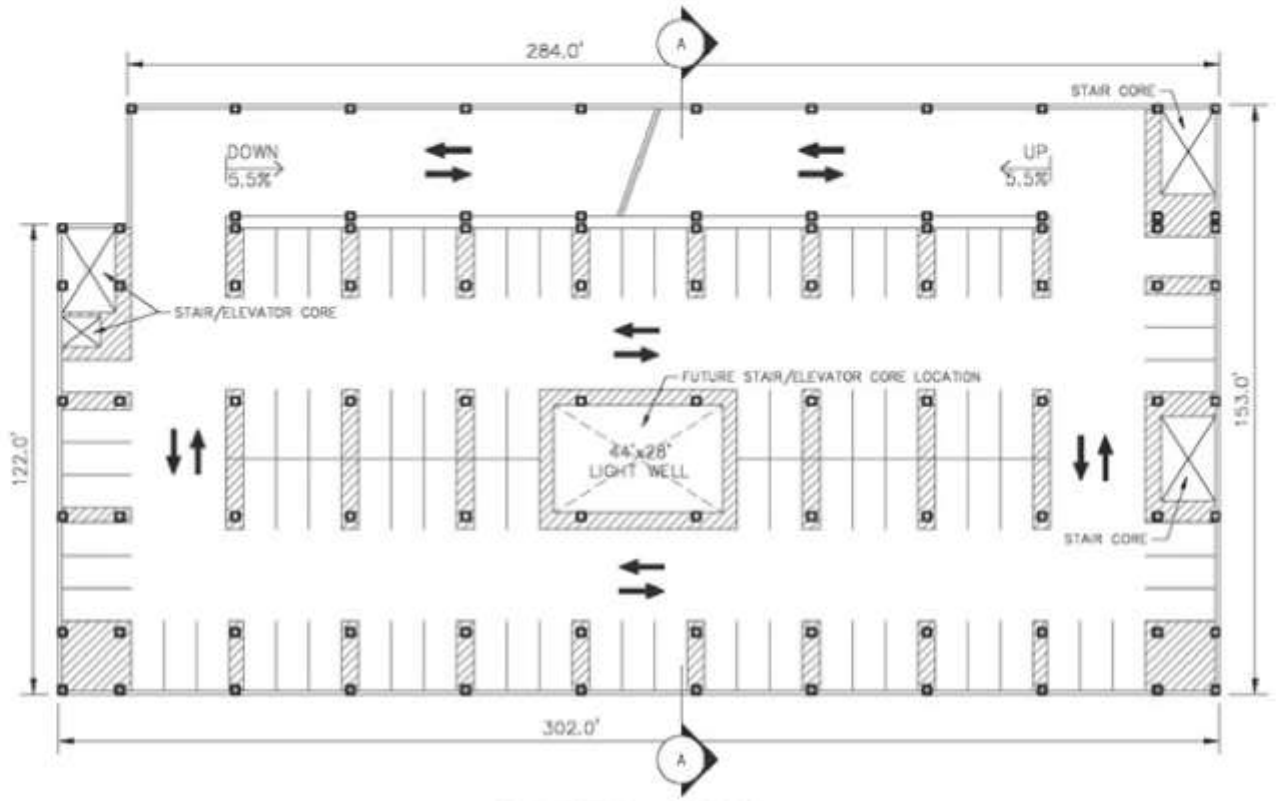
- Higher floor-to-floor heights
- White interiors
- Lighting levels that exceed IES minimums
- Glass-backed elevators
- Enhanced graphics/level theming and wayfinding

For future parking infrastructure (beyond the initial Phase of development), we recommend that CCDC develop an aggressive parking and modal split monitoring program designed to track parking demand (as well as progress on the evolution and impacts of autonomous vehicle and shared mobility). Depending on these results, the design of any additional parking structures should strongly consider parking design options that will allow future adaptive reuse (see the previous chapter for details).

CONCEPT 1: NEAR-TERM USES



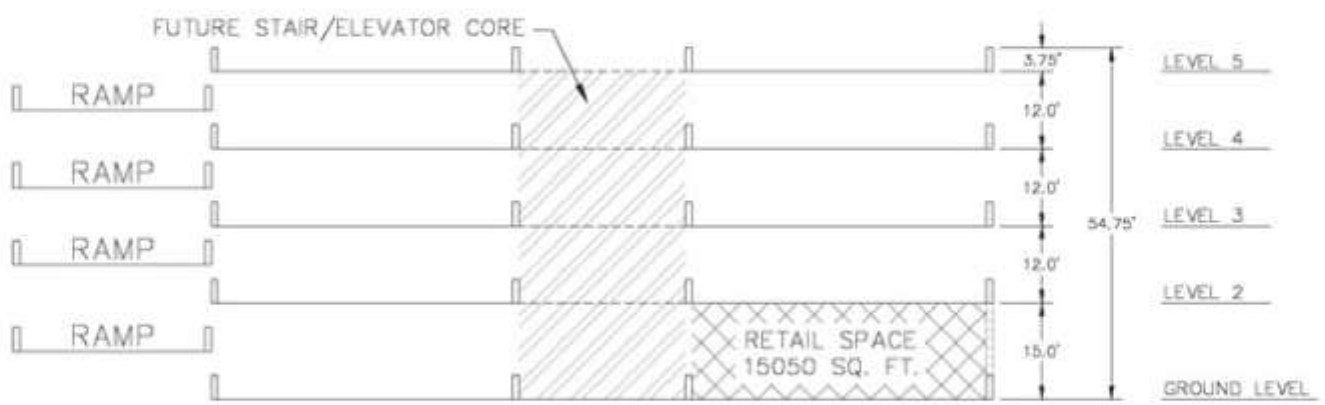
GROUND LEVEL



TYPICAL LEVEL

PARKING STALL COUNT SUMMARY				
LEVEL	SPACES (8.5'x18')	AREA (SF)	PARKING EFFICIENCY	RETAIL AREA (SF)
GROUND LEVEL	55	25615	466	15050
LEVEL 2	94	45648	486	–
LEVEL 3	94	45648	486	–
LEVEL 4	94	45648	486	–
LEVEL 5	94	45648	486	–
TOTAL	431 *	208207	483	15050

* THE TOTAL NUMBER OF SPACES HAS NOT BEEN REDUCED TO ACCOUNT FOR LOSS OF SPACES DUE TO ADA ACCOMMODATION, MOTORCYCLE PARKING, AND UTILITY AND STORAGE ROOMS.



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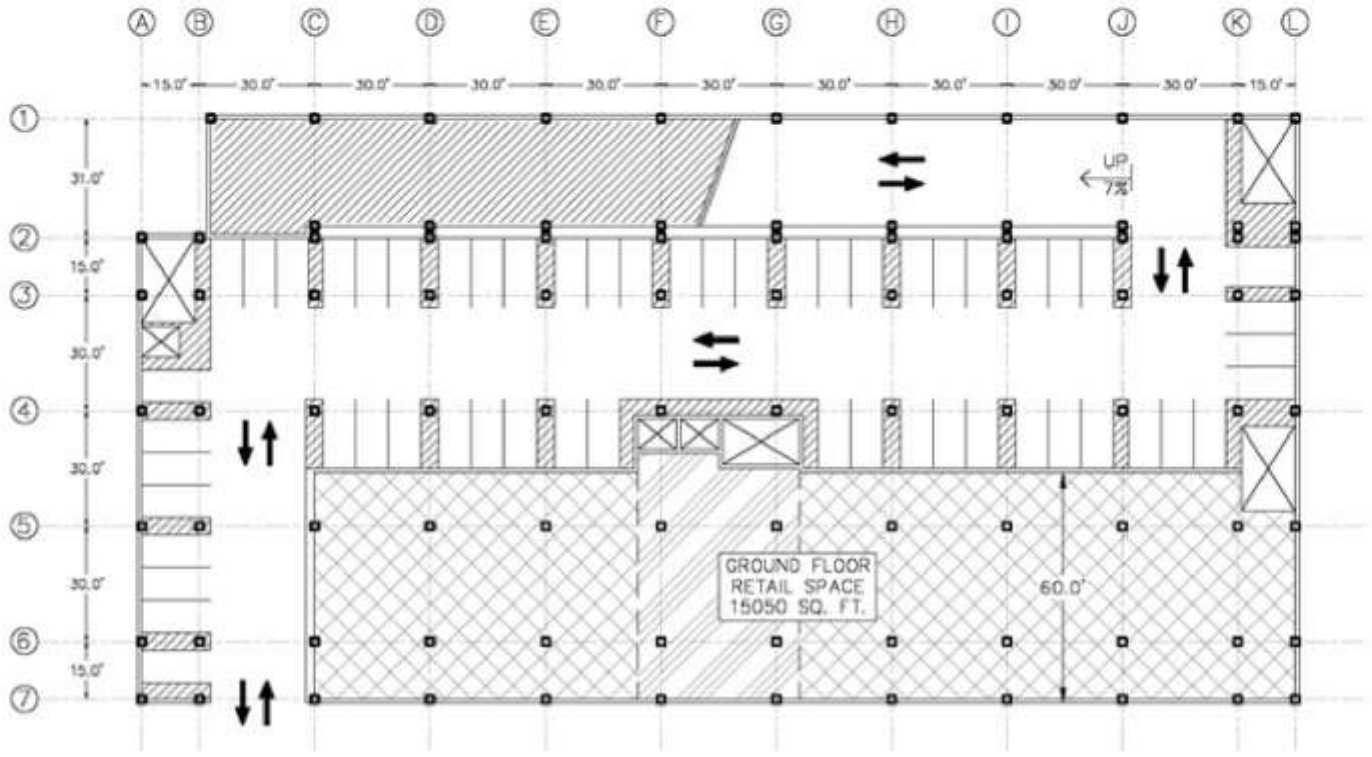
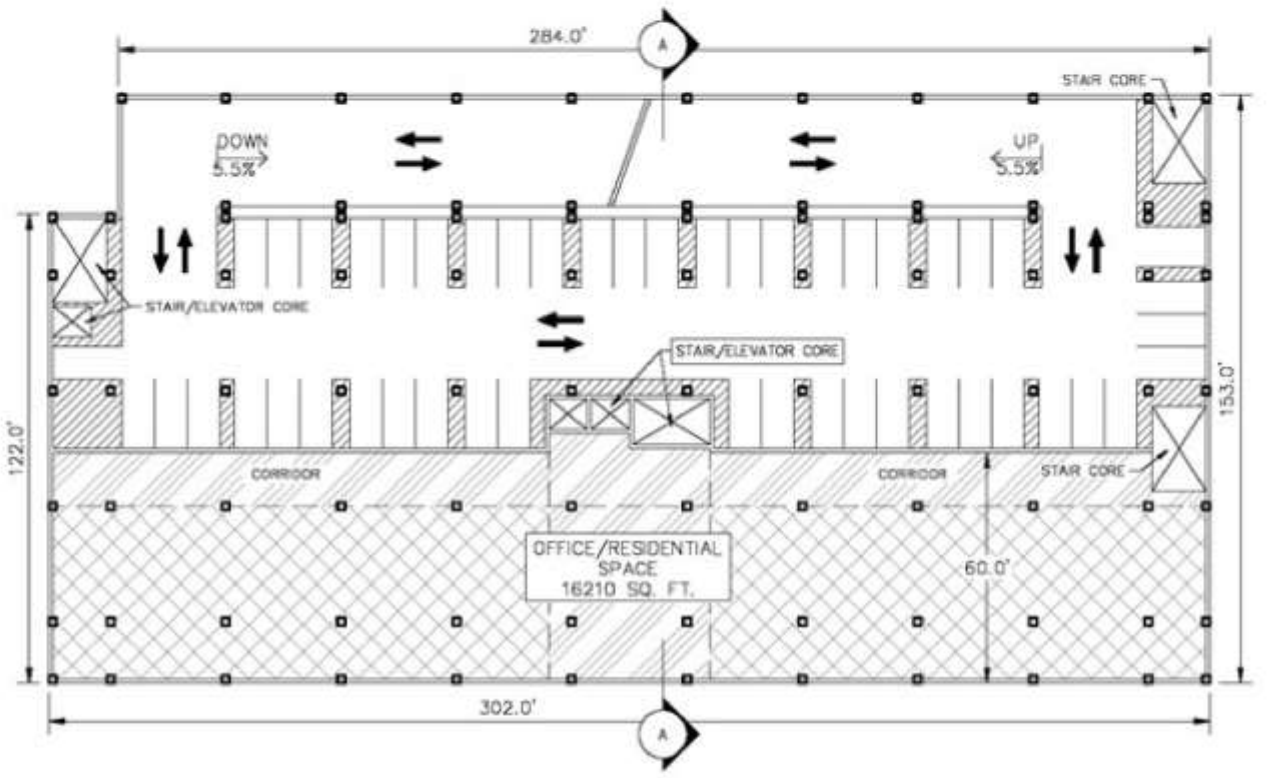
CONCEPT 1: FUTURE BUILDING USES



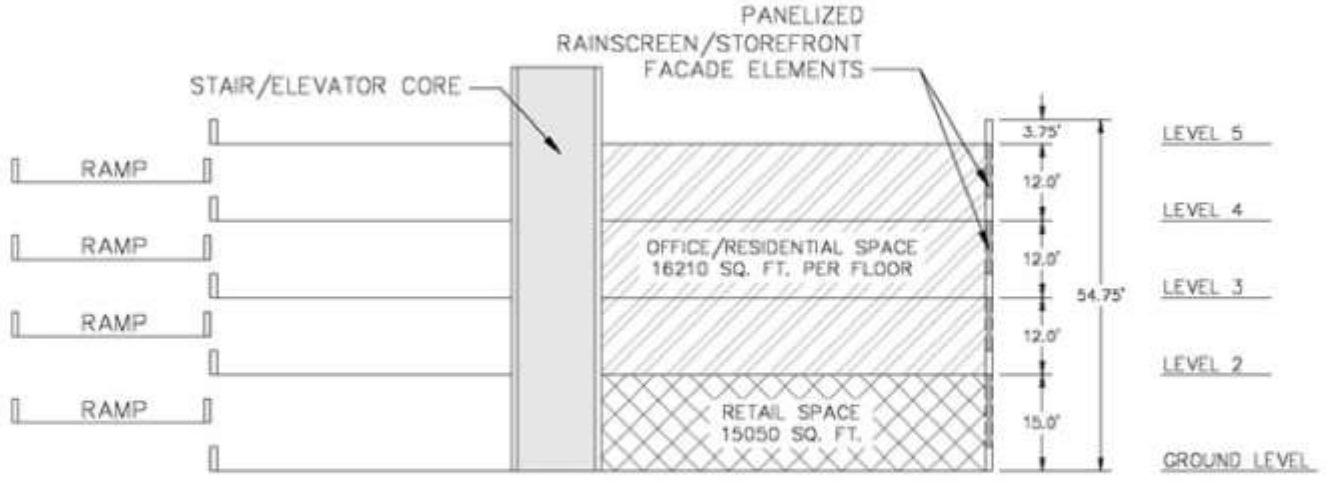
GROUND LEVEL



TYPICAL LEVEL

PARKING STALL COUNT SUMMARY					
LEVEL	SPACES (8.5'x18')	AREA (SF)	PARKING EFFICIENCY	RETAIL AREA (SF)	OFFICE/RESIDENTIAL AREA (SF)
GROUND LEVEL	55	25615	466	15050	–
LEVEL 2	48	27530	574	–	16210
LEVEL 3	48	27530	574	–	16210
LEVEL 4	48	27530	574	–	16210
LEVEL 5	94	45648	486	–	–
TOTAL	293 *	153853	525	15050	48630

* THE TOTAL NUMBER OF SPACES HAS NOT BEEN REDUCED TO ACCOUNT FOR LOSS OF SPACES DUE TO ADA ACCOMMODATION, MOTORCYCLE PARKING, AND UTILITY AND STORAGE ROOMS.



SECTION A–A

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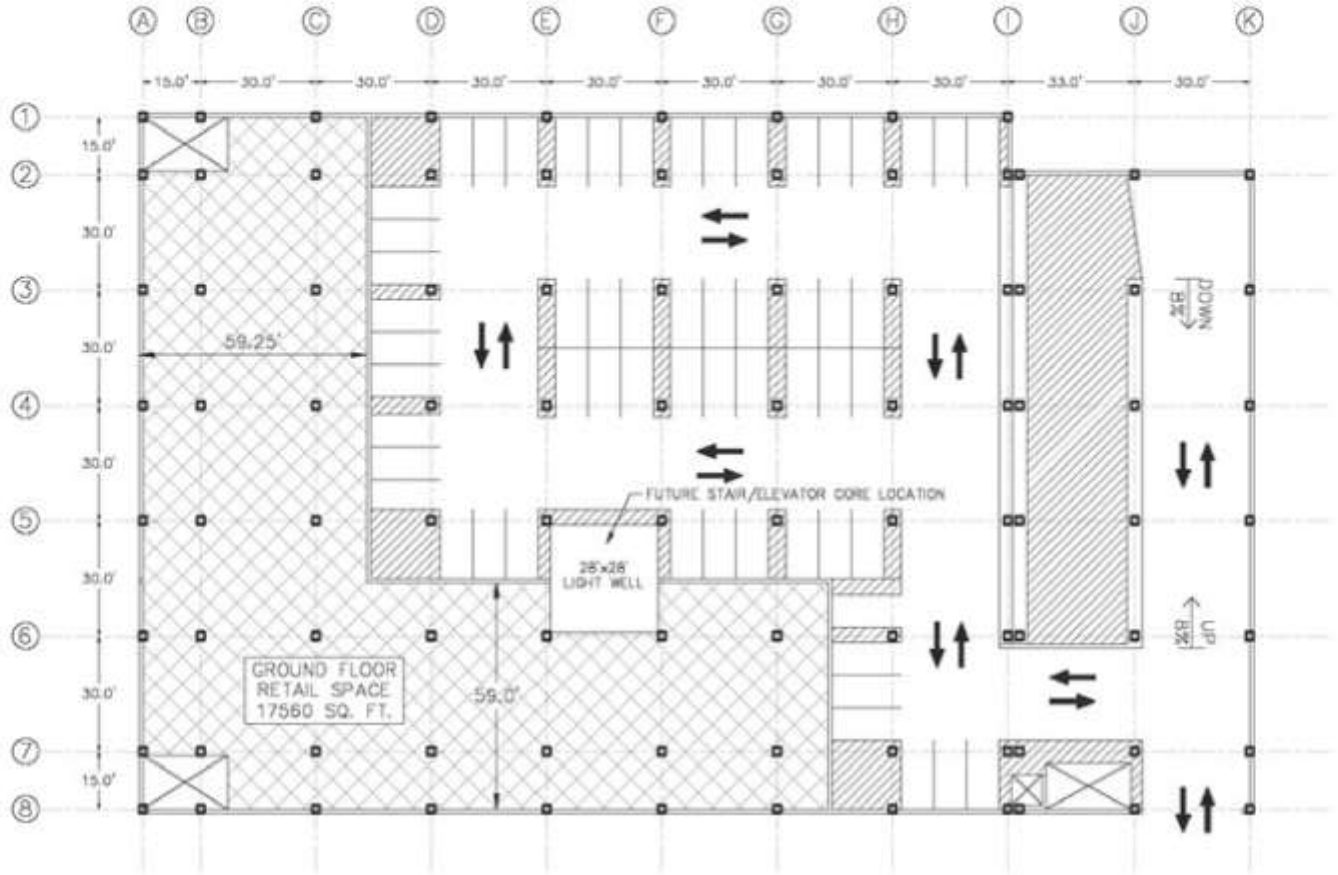
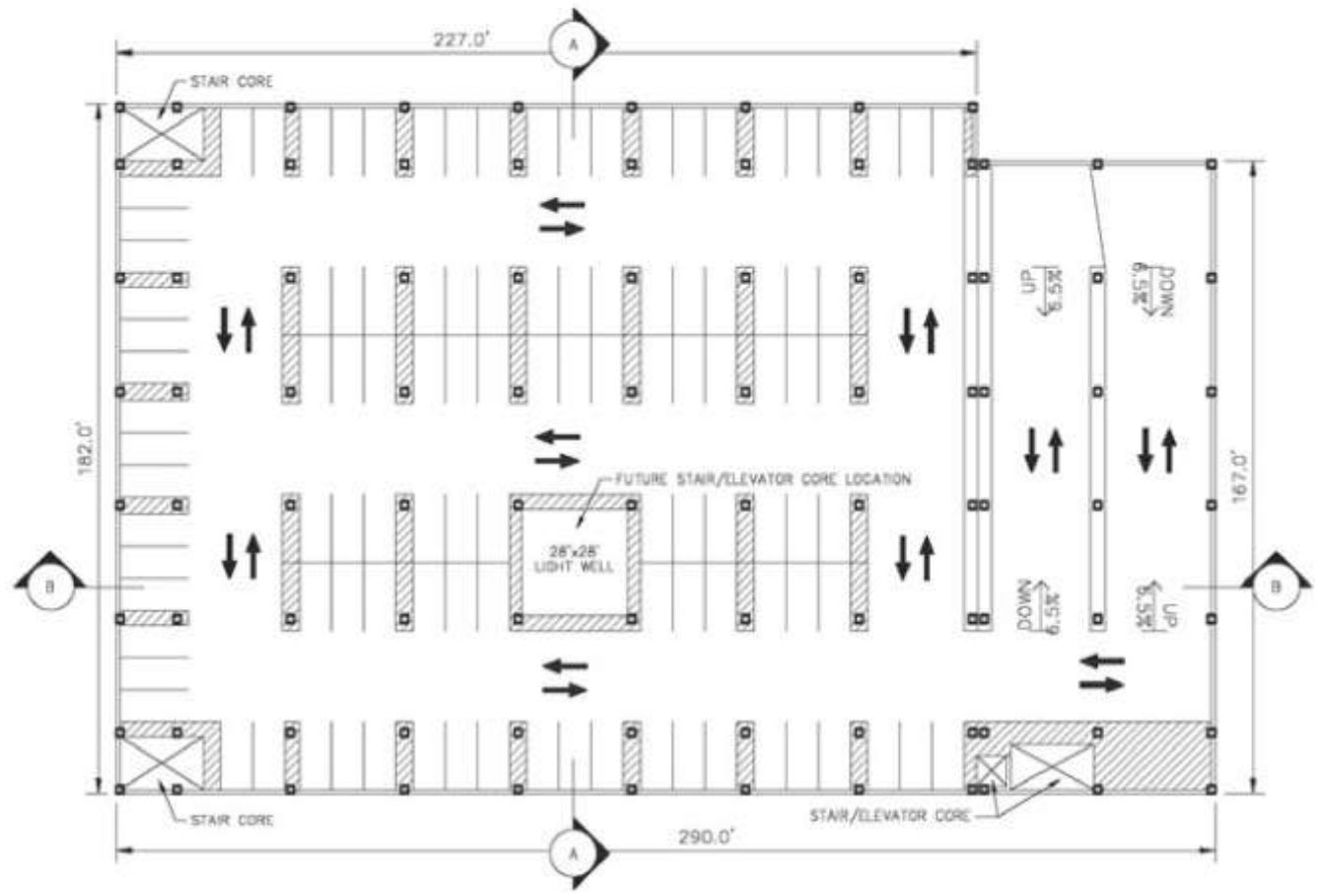
CONCEPT 2: NEAR-TERM USES



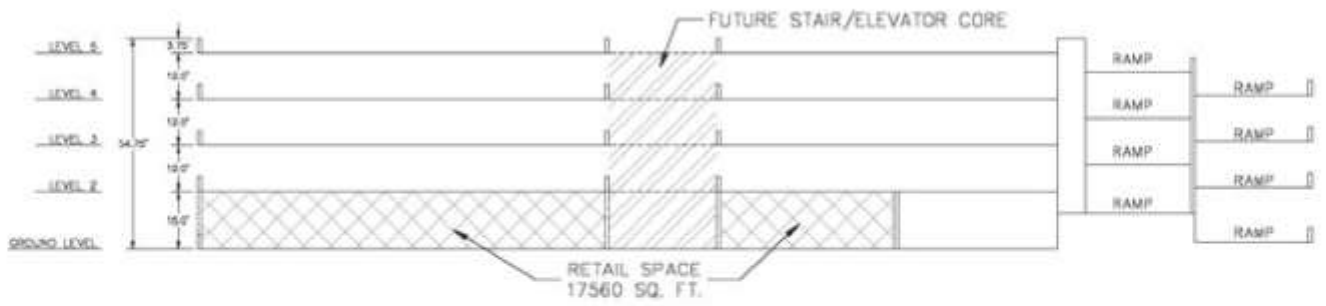
GROUND LEVEL



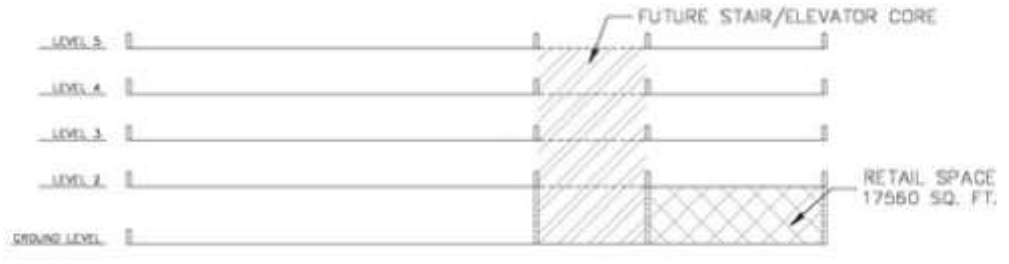
TYPICAL LEVEL

PARKING STALL COUNT SUMMARY				
LEVEL	SPACES	AREA (SF)	PARKING EFFICIENCY	RETAIL AREA (SF)
GROUND LEVEL	58	29804	514	17560
LEVEL 2	109	51835	476	–
LEVEL 3	109	51835	476	–
LEVEL 4	109	51835	476	–
LEVEL 5	109	51835	476	–
TOTAL	494 *	237144	480	17560

* THE TOTAL NUMBER OF SPACES HAS NOT BEEN REDUCED TO ACCOUNT FOR LOSS OF SPACES DUE TO ADA ACCOMMODATION, MOTORCYCLE PARKING, AND UTILITY AND STORAGE ROOMS.



SECTION A-A



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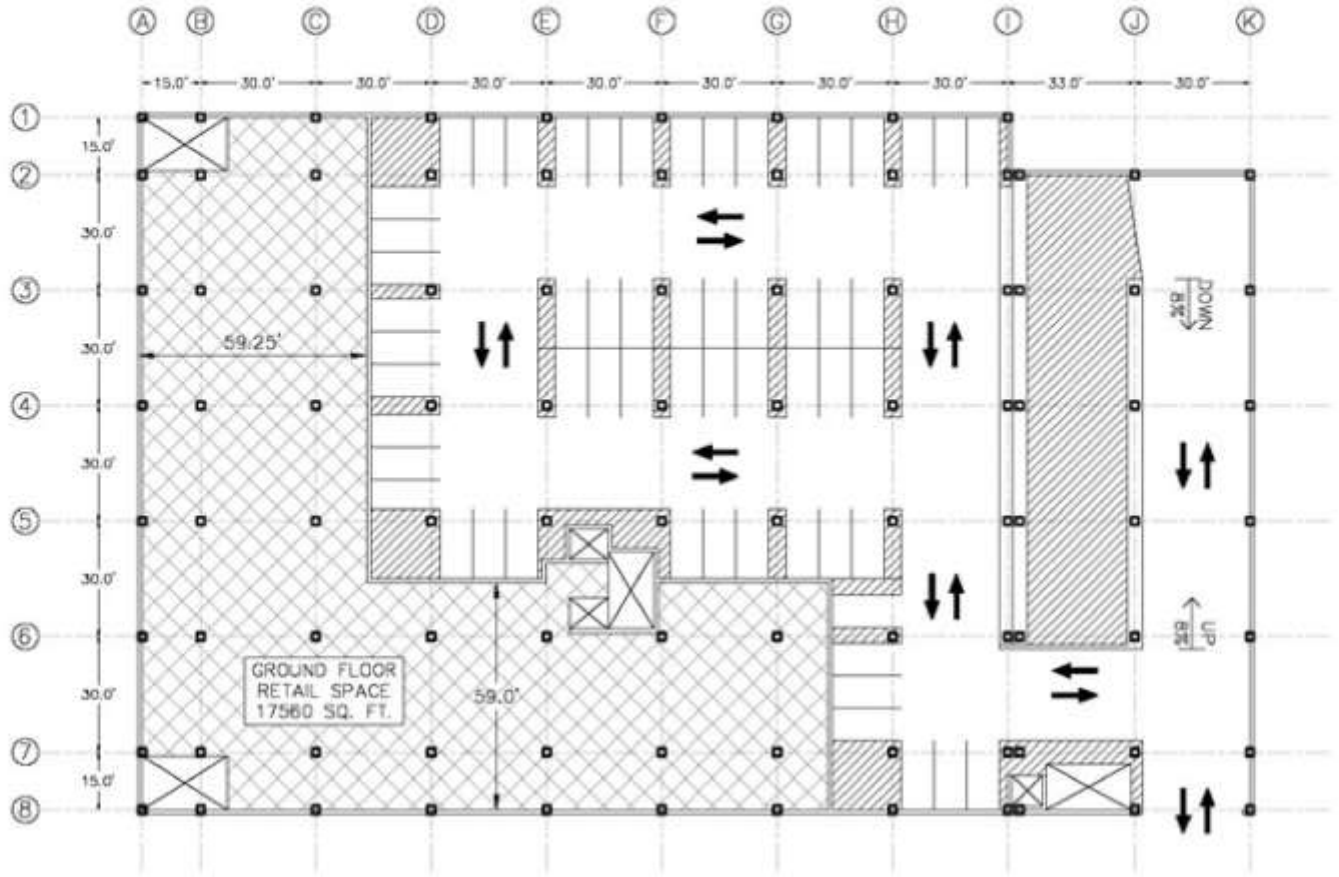
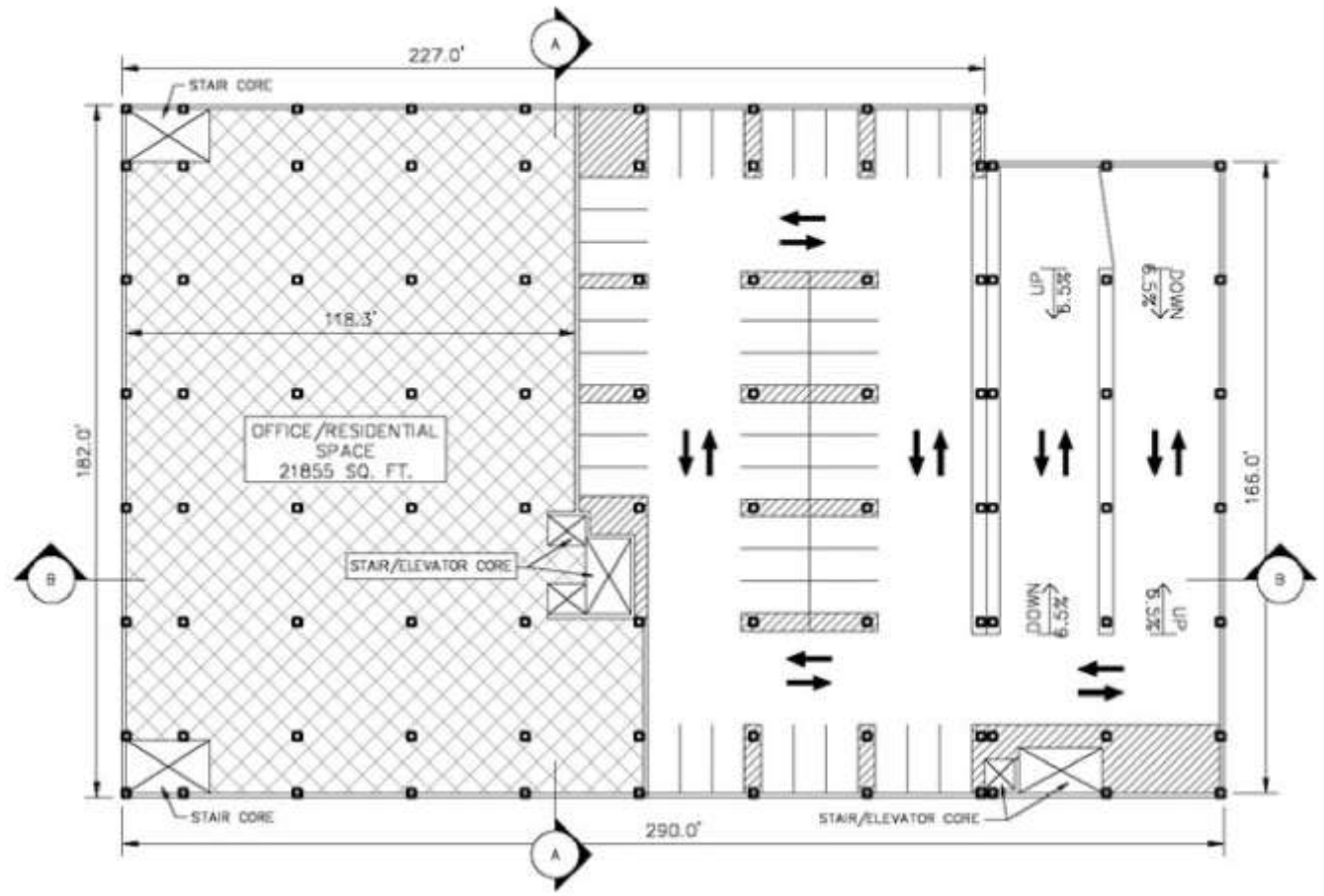
CONCEPT 2: FUTURE BUILDING USES



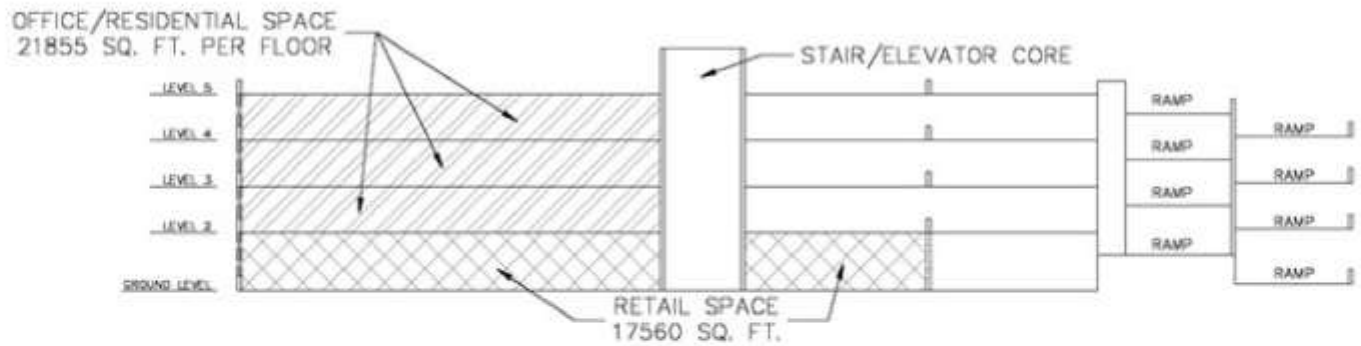
GROUND LEVEL



TYPICAL LEVEL

PARKING STALL COUNT SUMMARY					
LEVEL	SPACES (8.5'x18')	AREA (SF)	PARKING EFFICIENCY	RETAIL AREA (SF)	OFFICE/RESIDENTIAL AREA (SF)
GROUND LEVEL	58	29804	514	17560	–
LEVEL 2	45	29120	647	–	21855
LEVEL 3	45	29120	647	–	21855
LEVEL 4	45	29120	647	–	21855
LEVEL 5	109	51835	476	–	–
TOTAL	302 *	168999	560	17560	65565

* THE TOTAL NUMBER OF SPACES HAS NOT BEEN REDUCED TO ACCOUNT FOR LOSS OF SPACES DUE TO ADA ACCOMMODATION, MOTORCYCLE PARKING, AND UTILITY AND STORAGE ROOMS.



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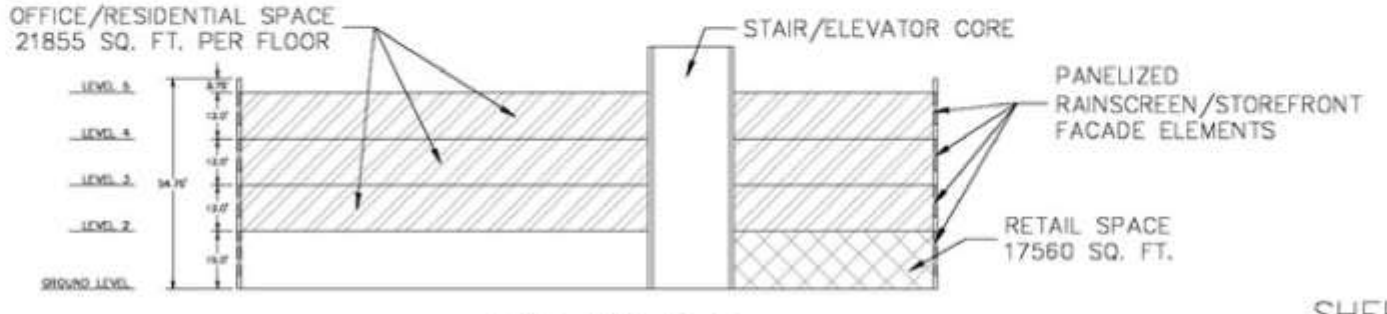

SECTION B–B

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KIMLEY-HORN AND ASSOCIATES, INC.

Parking Planning White Paper Series

Parking AS AN Economic DEVELOPMENT STRATEGY

Kimley»Horn

Parking AS AN Economic DEVELOPMENT STRATEGY

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Acknowledgements

This research began with requests from several clients that desired more information on the topic of "Parking as an Economic Development Strategy".

A series of initial research questions was developed and refined internally and then an email was sent out to respected industry experts and economic development practitioners.

We would like to acknowledge several individuals that made special contributions to the production of this "white paper".

- **Mr. Phillip K. Kushlan**
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  Toronto Parking Authority

Introduction

Parking as an Economic Development Strategy?

The idea that parking can be an effective economic development strategy has gained greater and greater acceptance as innovative programs from around the country have proven this concept with many successful examples. We have documented several of these case studies in this white paper.

However, as the principles have become more accepted many clients are asking us how they can take this concept to the next level.

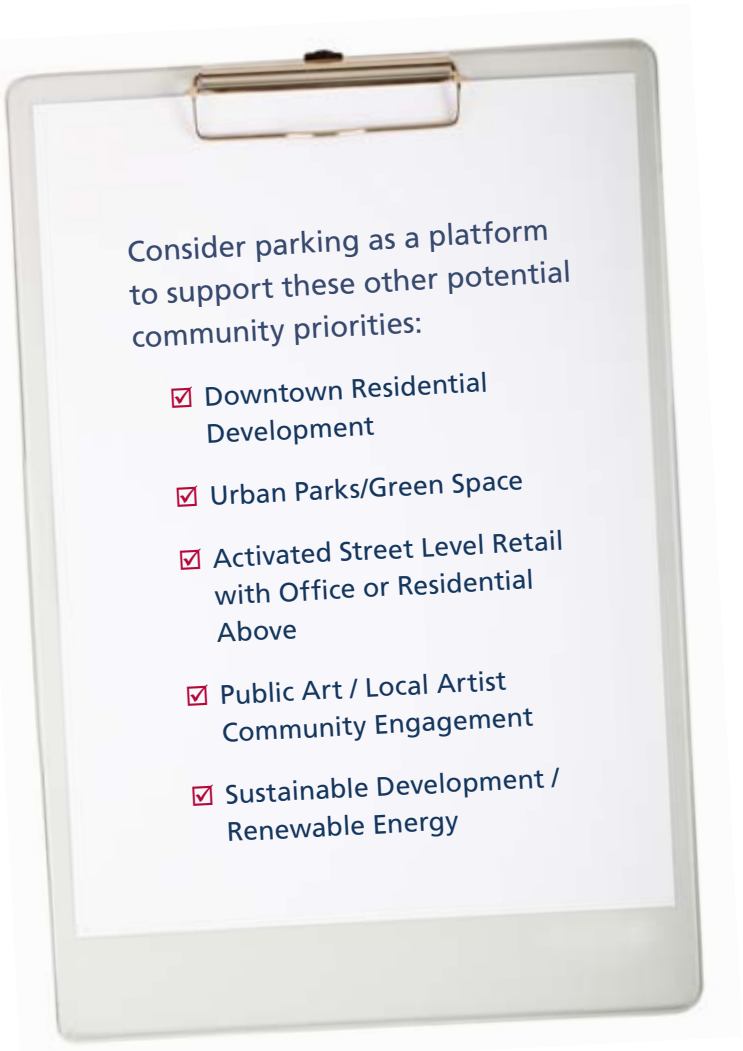
- What new trends are emerging?
- What are the specifics strategies that have proven to be most successful?
- What are realistic 'return on investment' ratios?

In this White Paper we will evaluate these questions and many more.

Leverage parking development to catalyze additional community development.

Having a well-defined and shared vision relative to preferred or targeted types of development is a key first step in the process.

Parking can also be used as a "platform" to achieve a variety of other community goals, beyond parking infrastructure.



Overview

Several maturing parking programs across the US want to move into a new phase for their organizations. They are looking for ways to improve their communities and stimulate additional community and economic development opportunities by leveraging strategic parking and mixed-use facility development.

These programs have developed more advanced and sophisticated planning capabilities in recent years. They have well defined ”parking analysis zones” and actively monitor changes to parking supply and demand. They measure and track changes to on-street utilization. Using pricing and regulation (time-limits, special permitting strategies, etc.) they are managing their limited on-street resources to maximize their value by promoting turn-over. Price is being used, as recommended by the noted UCLA economist Dr. Donald Shoup, to achieve a targeted on-street vacancy rate of 15%.

New technologies are emerging that will greatly change the parking management landscape in ways that would have been hard to image even a few years ago. The impact of “smart meters”, wireless sensors, web-based parking availability data, on-line parking reservation systems and even satellite-based mechanisms that employ GPS and GIS “geo-fencing” technologies will combine to create “smart parking systems” that will help reduce green house gas emission, improve parking availability and make paying for parking easier and more customer friendly. All of this is even more powerful when combined with sophisticated new mobile devices such as the I-Phone. Indeed, at last count there were already 60+ “apps” designed just for parking related uses. It is hoped that this new data rich world of “smart parking” will allow us to better utilize existing parking resources (and recapture some the value inherent in the “over-built” parking supply of the past decades) as well as to begin providing better designed parking facilities that are integrated with a variety of mixed-uses and that better complement the urban fabric in which they exist.

Mixed-Use Parking as an Economic Development Catalyst

There are many variations on the theme of parking as an integrated use in a mixed-use development project. There is little doubt that parking is an essential element in the success of these projects. In many cases, it is often the parking dimension that, from a developers perspective, makes the project “not pencil”. Parking facility design and management have dramatically improved in recent years. We no longer “deaden an entire block or half block in a downtown for a “vehicle warehouse”. We now see parking facilities more as the “interface between the vehicular and pedestrian experience”. Parking facilities are being designed more as “people places” than simply as dull, grey, utilitarian storage facilities.

Mixed-Use Parking Design Advances

Architecturally, parking is being developed to better blend into and even contribute positively to the "urban form". Several successful design approaches for integrating parking in urban environments with other uses are becoming well accepted. These models include:

Parking Design Approach

Parking facilities **book-ended** with other uses

Design Approach Example

City of Greenville, SC **Spring Street Garage**

Description: This 912 space, 3 bay parking facility is located at 316 S. Spring Street, Greenville, SC. This multi-level parking garage, located adjacent to the Wachovia Building and the Bookends development, provides monthly, daily and event parking in downtown Greenville.

Parking Design Approach

Parking facilities **wrapped** with other uses

Design Approach Example

City of Boulder, CO **15th & Pearl Street Garage**

Description: This 686 space, 2 bay parking facility is located at 15th Street and Pearl Street in downtown Boulder is conveniently located near the Pearl Street Mall. This multi-level parking garage is wrapped with retail uses on the street level and office space above.

The facility provided monthly and hourly parking.

Parking Design Approach

Parking facilities **stacked** between other uses

Design Approach Example

LoDo District Downtown Denver, CO **Wynkoop Garage**

Description: The Wynkoop garage in the LoDo District of downtown Denver is an example of a "stack" garage design with 2 levels of below grade parking, a destination restaurant at grade, 4 levels of above grade parking below 4 floors of residential development.

Parking Design Approach

Parking facilities **'below'** with other uses

Design Approach Example

The City of Greenville, SC **Terrace at Riverplace**

Description: The Terrace at Riverplace is located just off of Main Street and across from the $13.5 million River Falls Park on the Reedy River in downtown Greenville, SC. The Terrace is part of the $65 million RiverPlace mixed use development which includes 155 RiverPlace, RiverHouse, The Terrace, and The Hampton Inn and Suites. The project includes office space, retail space, restaurants, and condos. RiverPlace also offers underground secured parking with card access.

Parking as an Economic Development Strategy?

Best Practices Research

Innovative municipal parking programs, urban redevelopment agencies, business improvement districts and downtown development authorities have led the charge as it relates to leveraging investments in strategic parking and mixed-use facility development as a key strategy to improve their communities and stimulate additional economic development opportunities.

One key trend we have identified is that many of these parking programs have developed more advanced and sophisticated planning capabilities in recent years. They have well defined ”parking analysis zones” within their downtowns and actively monitor changes to off-street parking supply and demand. They also have begun measuring and tracking changes to on-street utilization. Using demand-based pricing and other creative parking management strategies such as extended time-limits combined with progressive on-street parking pricing, pay-by-cell phone options, special permitting strategies, etc., they are beginning to manage their limited on-street resources to maximize their value by more effectively promoting turnover and also providing enhanced customer services and more flexible parking options. Price is being used to achieve the goal of a 15% on-street vacancy rate. This has had the related effect of improving access to businesses, reducing traffic congestion, lowering fuel consumption and lessening greenhouse gas emissions.

These advances in planning and management are being combined with another, and perhaps more important trend – a philosophy that aims at making parking more visitor friendly (and thereby positively impacting the “overall downtown experience”). It is important to note however, that “friendly” does not equal “free”. Parking is never free, even when there is no direct charge to the customer – someone somewhere is paying the price for providing not only the space, but the utility costs, the maintenance, the management, etc.

As part of the research effort for this project we focussed on identifying new or creative approaches to using parking as a tool for economic development.

Following are a series of interview questions and responses from several respected industry professionals.

Research Interviews

1. What are the current industry best practices and successful strategies related to parking facility development? How are these development deals structured?
    a. "Generally public/private deals are not unlike pure private deals insofar as each side has assets to bring to the table to leverage the assets of their partner. The primary negotiation revolves around how much each side is willing to offer to get what the partner can provide. Thus it is very important on the private side to understand what the public interest is for any given project, and tailor a response to that. Usually it is clearly articulated in a plan (a downtown plan for example) or in a series of goals in the community's comprehensive plan.
    b. From the public side, it is important to understand how the developer is structuring a proforma…what market they are trying to land and where their cost centers and risk centers are. For example, if a major tenant is insisting on available parking while the lender is insisting on a certain return ratio, the ability of the public to bring the parking availability to bear to remove the cost and risk of building and operating parking from the developer's proforma, while addressing the tenant's demand, can make the difference as to whether a project gets the necessary bank funding to get off the ground. Understand, however, that unlike private / private agreements, the public side is heavily wrapped in legal limitations, public process and transparency. This comes with the territory, so any time a private developer wants to leverage their idea by working with a public entity, they need to build in sufficient time and resources to work through a lot of the necessary "fairness" limitations the public side has to work with, and be ready for the "sunshine" laws to come to bear…so lots of documentation will be necessary.
    c. Consider the concept of a "Bridge Investment" rather than a full subsidy as in the example below. From the public entity perspective, understanding the "real needs" of the private sector partner can mean the difference between a project moving forward or not. Our agency was in discussions with a partner to redevelop a surface parking lot into a 600,000 square foot mixed-use project. Originally the developer asked the agency to build them a $12,000,000 parking structure. Ultimately it was determined that the there was financing gap of $180,000 per year for five years. Rather than a cash incentive, the agency ultimately agreed to lease the developer 200 parking spaces/year (which it had available in a nearby parking facility) for five years

at no charge (an in-kind contribution of approximately $1,000,000 in value). This essentially equated to a "bridge Investment" by the agency that allowed the deal to move forward.

2. What is the best way to interest potential development partners?

   a. Transformational investments. If an existing property or area has inherent value that is not being tapped, the market will already have responded to that and you will be fending off development proposals. Usually the case is that the public is trying to interest developers in property that really does not appear to have inherent value beyond its current use. The way to change that is for the community to decide on what can be done on the public side to inject value where there was none before.

   For example, before our Fayetteville Street Renaissance project was funded and under construction, nobody would take a risk on downtown Raleigh. After…suddenly a lot of properties were being acquired, new buildings built and everything seems to have taken on new value and a transformed market image that generated a lot of tax base. Deciding what that transformational investment or investments are is the key. You need LOTS of private sector, market savvy input before pulling the trigger on expensive public projects to ensure that there will be a fish on the end of the hook when you cast it.

   b. Boise essentially created a parking district that over-built supply in strategic locations and then worked on multiple tracks to stimulate community development to "grow into it". We approached parking as a utility to support long-term growth. Under this approach it is perfectly logical to build capacity ahead of immediate demand needs.

   c. Our approach also considered the "idealized build out" of the downtown based on our downtown master plan. We developed our parking development plan to support the desired build out. We were guided by two major principles – first, we desired to keep the public parking supply between 30 – 40% of the total parking supply. This approach provides us flexibility relative to attracting new development and allows us the capacity to address uses in the realm of the "public good". Second, we understood that we would have to make more of our parking investment on the front end of the process.

   d. Boise made it to the top of the Forbe's "Best Places to Do Business" list by "creating places where people want to

The Cube is a unique and innovative landmark tower that will occupy a prime location within Dubai Sports City. Parking condos are available in the basement level.

be". The combination of integrated parking (all of our parking is in convenient, mixed-use facilities with activated street-level uses) and a concentrated effort on "place making" and public realm improvements.

e. We embraced the idea of an "E Zone" or "Energy Zone" in the downtown core. The synergies created by the downtown environment is large part of our success. Parking, and specifically parking facility design, is an important component because it contributes to our compact urban form and the reduction of surface parking lots.

3. What combinations of financing options are most popular and most successful?

   a. One successful strategy is "Certificates of Participation". They offer several benefits. First, they are mortgage-backed, essentially, because City assets are put up as collateral, thus making them low risk and thereby low cost investment vehicles. We have found them equivalent to General Obligation financing in terms of cost, without the necessity of any kind of taxpayer referendum on their use.

   b. When putting together public / private partnerships, one of the benefits of working with the public is that public sector entities are often more tolerant of longer-term payback schemes where an asset is provided by the public to leverage private development, much more so than equity partners or banks, so this ability to be around long enough to tolerate a longer horizon is a potential "asset" that public entities bring to the table.

   c. Another option to consider is the "condominiumization of parking". Under this scenario the land doesn't have to be purchased by either party. The condominium association owns the land and manages the property including shared expenses and taxes.

4. What combinations of incentives are currently being offered?

   a. Right now (due to the economic downturn) we are not offering a lot of direct incentives, but generally when it comes to land development, the cost of land is one of the first things the developer goes after. If the public can acquire land and then re-sell it at favorable terms, this helps leverage a private proforma.

   b. Many communities provide cash incentives based on jobs or total investment. Some believe that this rarely determines whether the project gets built, particularly in a downtown. Usually after the private side team has already determined where it wants to build, then it goes after as much cash as it can leverage out of the elected officials.

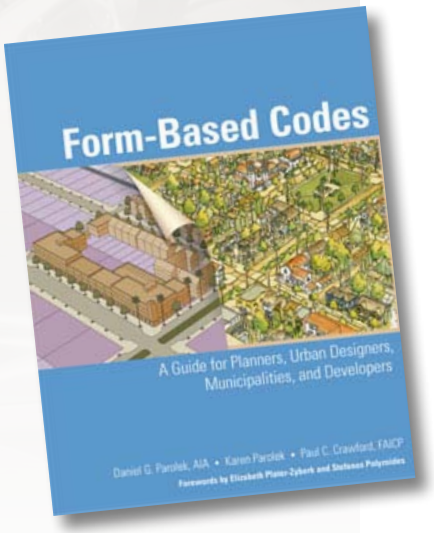
   c. Parking is a favorite downtown leverage tool, as it is a business the public is often already in and it is usually (unless you are in a REALLY big or very enlightened mar-

With capital funds in short supply, public investment can sometimes make the difference with "projects on the bubble". The key is often understanding the real estate equation. The agency needs to understand where to draw the line. Sometimes, the fact that an incentive is offered at all is as important as the amount.

ket) a key factor for lenders as to whether they will finance a project. Co-development with transit stations for those communities with a fixed-guideway transit system is also a huge incentive to partner with the public.

5. What specific options are seen as producing "win - win" scenarios for different communities?
    a. Deals that are structured where there are documented returns to the public are often easiest to justify…a cash flow that can be documented such as specific tax base enhancement commitments, creation of permanent jobs if a major employer is involved, etc.
    b. On the other side, developers need to see both a short term (this current project is profitable in the short run) and a longer term (this deal will potentially spin off more deals with the same public entity) benefit from playing ball with the public sector. This is often why working with local developers with more of a stake in the success of the local market sometimes works better than going after the big, national development entity who may flee the market if times turn bad.
6. What are the common obstacles that tend to sour these public-private partnerships?
    a. Unrealistic expectations…on both sides. Also an unwillingness to trust. There is no way you can write down every last contingency in a deal. All deals involve some level of trust on both sides. This has to be clear up front, and a commitment made to work through things in the middle when something unexpected comes up. The best thing to do is to talk clearly about how to deal with unexpected issues, not to try to anticipate all of them and write them all into an agreement up front.
    b. The public sector is all about process and fairness. There will be multiple committee meetings. The design will likely be micromanaged to some degree. It is very important for private side entities to build this extra time into the project schedule and make sure somebody on their team is good at navigating the public process.
7. What types of deals should public agencies avoid? Why?
    a. Avoid anything that involves putting the public in the role of primary risk-taker. Risk analysis in land development is not something public sector agencies do particularly well, and in a public/private deal it should be made clear up front that the public is not in the entrepreneur role in a typical deal. That should be the private sector entity's role, and the public risk ought to be clear, simple, and limited…the major financial benefits may need to go to the private side but the primary risk should be there also.

And if you are really creative, your parking garage can compliment your new library very nicely (Kansas City Public Library Parking Garage)



b. Public entities also ought not to make their decisions based on a glorious vision of a very cool development. Instead, the decision should be made looking at a spreadsheet and a balance sheet. The key success factors on public / private developments revolve around the strength of the private side financing package and the predictability of behavior of the public side partner. To the extent these can be maximized, the likelihood of the project being a success is enhanced.

8. What creative combinations of land uses have produced special benefits for their communities?

   a. Projects that attract the young as well as the working age public. Kids bring parents. Parents bring money and come back on the weekend if they like what they see. Youth brings energy.
   b. Libraries are excellent tools for attracting kids, as are museums. Places to have big outdoor parties that generate lots of press (New Year celebrations, food celebrations, concerts, etc.) are great compliments to retail and office as well as urban residential. In Boise, housing projects have generated the greatest amount of "spin off" benefits.
   c. Sports venues bring lots of people but beware…they also tend to spawn lots of surface parking that kills life around it when an event is not taking place. The best public investments we have made in Raleigh have SYMBOLIC value! The reconnection of iconic architectural views between the state capitol and the performing arts center. A major artwork that can be seen on the skyline, creating a postcard view. These things change the way people think about a place, and lift everyone's boats.

9. From a planning perspective, are there new concepts or specific development code approaches that encourage creative urban designs and special partnership opportunities?

   a. "Form-based" codes often work well in dense urban areas, by creating an emphasis less on land use and more on form, relationship of the building to the street, density and amenity access. Having a rehabilitation code option that applies realistic building code standards to old buildings means more investment in historic buildings that bring character and interest to a city.
   b. Most of the incentives that might encourage more public-private arrangements would happen on the state level in states that govern the activities of cities. The ability of public entities to engage in private projects is often limited by "no-competition" limitations or by restrictions on the ability of the community to provide tax or fee incentives for projects with a public benefit.

Case Studies

Case Study #1

The Ashley Mews Project

ANN ARBOR, MICHIGAN

Ashley Mews was one of the first downtown developments since the early 1980's. The city owned a piece of land at the intersection of Main/Packard and wanted to sell it for redevelopment with the goal of seeing at least some affordable housing units (80% of AMI) included as part of the project.

The Ann Arbor Downtown Development Authority (DDA) helped facilitate the conversation between the City & the developer (Syndeco is the real estate arm of Detroit Edison). Final arrangement had a 9 story office building with first floor retail and penthouses on the top, and approx. 50 stacked townhouses of which 8 are permanently affordable.

The developer brought 120 of their own underground parking spaces, but needed 100 more parking spaces plus some gap financing. The DDA provided some funds toward the affordable housing units and additional funds toward the project's pedestrian improvements to make the numbers work.

We gained a wonderful mixed use project that made it possible for Detroit Edison to bring 400-500 high paying jobs (the building houses all the energy company's subsidiaries such as Detroit Edison Nuclear, Detroit Edison Wind, etc.) plus more than 50 new downtown residents (the penthouses were a slower sale because the space wasn't built out and residents clearly had trouble understanding what $1 million was buying them).

Lesson Learned:

1. The City must know what it wants up front in a development deal like this so we can understand if it's worth providing a limited public asset (lots of public parking spaces) to accomplish their goal.
2. If possible, use these public/private arrangements to clean up previous mistakes (before the DDA took over parking, the City had given away parking permits in a contract for 3 renewable 20 year terms at the cost of operations plus bond payments. The bond payments were ending/if we hadn't revised the agreement the developer would have been paying $10-20/month for permits that cost other downtown users $100/month).
3. Consider all the elements that can make a project work, not just the parking elements.

4. Supporting Documents:
    a. Ashely Mews Development Agreement
    b. Ashely Mews Parking Agreement
    c. Ashely Mews Planned Unit Development (PUD) Agreement

Case Study #2

"BoDo" Development
Capital City Development Corporation, Boise, Idaho

The Capital City Development Corporation (CCDC) is the urban renewal agency in Boise, Idaho. The CCDC manages three separate districts in the downtown area as well as managing the off-street public parking system.

CCDC has a stated goal of a 5 to 1 return on infrastructure investments. With the recent completion of the so called "BoDo" (Boise Downtown) project, they leveraged $15.5 million dollars in public infrastructure investment (The Civic Center parking garage [$8,000,000], the Myrtle street garage [$6,000,000] and a $1,500,000 investment in streetscapes) in return for $87,000,000 in private development – a 5.61 return on investment!

Beyond this initial success, the "BoDo" project also generated another $650,000 in tax increment financing revenues that the CCDC will reinvest in downtown and the project is generating an additional 1,000 parkers per day for an estimated $800,000 in additional parking revenue per year. It is also worth noting that the "BoDo" project brought several targeted types of development to the downtown including a 17 story residential development, a multi-plex cinema and a new hotel.

Lessons Learned:

1. CCDC has successfully used "parking development as a catalyst for other development"
2. They have a defined expectation (5 to 1) relative to parking and other infrastructure investments.
3. Their standard agreement is a "blank page". Be flexible. Consider all options,
4. Housing/Residential development projects have more spin-off benefits.
5. Their parking strategy was based on an "idealized build out" of the downtown based on the downtown master plan. Their parking development plan is designed to support the desired build out.
6. Goals: Keep the public parking supply between 30 – 40% of the total parking supply & realize that more parking investment is needed on the front end of the process.

Case Study #3

Village Green
Ann Arbor, Michigan

Village Green is the Ann Arbor DDA's most recent development project. The City distributed an RFP to sell/redevelop the site of our oldest parking structure. The Village Green project was selected and plans include a multi-story apartment building with an underground public parking structure.

The development agreement was much simpler than the Ashley Mews Project discussed above. The DDA formulated early what it was willing to provide to make this deal work ($100K per unit for up to 4 units of affordable housing to 60% AMI = $400,000 and exact dollar amounts for what it would pay to have the underground parking structure constructed ($35,000/above ground space + $45,000/below ground space). This eliminated negotiations later on, as the developer bids on the property were made knowing that these were the only two sources of local funds for the project.

Currently the DDA has no developers on its board so knowing the cost up front made sense for us. Since we no longer had folks on the board with real estate experience to negotiate for us.

Lessons Learned:

1. If the developer is building a public parking structure as part of this public/private development, come to an agreement up front on what the DDA or City is willing to pay per parking space since it is virtually impossible to delineate what is/isn't part of an underground parking structure (earlier developers wanted to charge the DDA for their construction crane costs, all costs to bring utilities to the site, etc.) Once this price is established, it makes it easier to sort between various bids for the site since the variables are reduced.
2. The DDA /Village Green parking agreement has us providing 73 spaces for monthly parking + 73 flex parking spaces, leaving some number for public parking. The flex parking numbers made the banks happier about providing financing since the project has more parking spaces per unit - even though the flex spaces can only be used at night.

Supporting Documents

1. Village Green Parking Agreement

TRANSPORTATION DEMAND MANAGEMENT QUICK GUIDE:

An Introduction to Transportation Demand Management (TDM) Strategies and Plan Development

Appendix 33

Kimley»Horn

Expect More. Experience Better.

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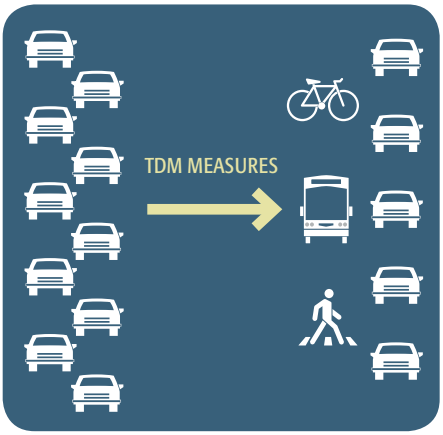
This Quick Guide is intended to help organizations with the following:

- Understand the definition of Transportation Demand Management (TDM)
- Determine if and why they should be interested in managing travel demand
- Explaining why changing travel behavior is so challenging and understanding the major factors affecting their ability to change behavior
- Provide a broad range of TDM strategies to test in order to develop or enhance their TDM program
- Understand the benefits to reducing travel demand
- Lay the framework for developing a TDM program
- Provide resources for more detailed research and explanation of TDM related measures and their outcomes

WHAT IS TDM?



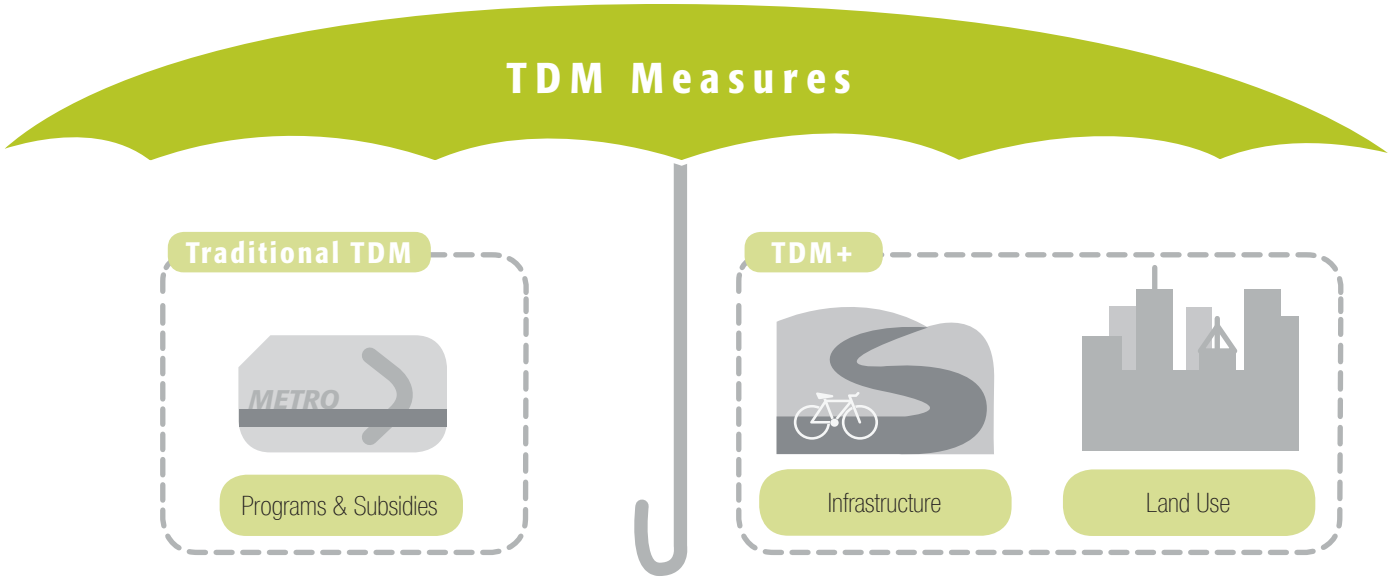
Transportation Demand Management (TDM), sometimes referred to as Travel Demand Management, is a transportation industry standard term that refers to a body of actions that seek "to manage the demand for travel by drive-alone private car, rather than catering for that demand, or managing the road system." In simple terms, TDM provides people with a variety of mobility options (other than driving alone) to reduce vehicle miles traveled (VMT) and gain environmental, conservation, and sustainability benefits – generally without large infrastructure investments. Measures are directed at increasing vehicle occupancy, shifting travel mode or time of travel, or reducing the need for travel. Much of the time, the focus is to reduce vehicular demand during peak morning and afternoon commute periods, but TDM measures have benefits that extend to off peak and special event travel times as well.

TDM actions, or measures, come in many shapes and forms, but are primarily broken out into the following categories:

- **Employer or Institutional Support Actions**
- **Financial Incentives or Disincentives**
- **Alternative Work Arrangements**
- **Local and Regional Infrastructure and Policy**

Advances in technology and mobile applications have rapidly been occurring over recent years. These technologies have improved information distribution and access to alternative forms of transportation through the ability to use algorithms to match riders with each other, communicate real time location of transportation modes and provide comprehensive travel information in one place. This is an aspect of the TDM industry that is rapidly evolving and will undoubtedly continue to enhance and integrate TDM measures into the way we all move around. Additionally, the advent of what is being referred to as "Mobility as a Service" concepts incorporate commute trip reduction, mobility data aggregation, private transit, taxi-like services (Uber/Lyft), ridesharing, car sharing, bike sharing, personal rapid transit and more are advancing rapidly.

TDM methods have traditionally emphasized program information, encouragement and incentives provided by local or regional organizations and have extended to the private sector; however, as congestion increases throughout the U.S., a stronger focus on infrastructure is entering the conversation. This focus on infrastructure (e.g. bike and pedestrian paths, transit enhancements, and even a stronger mix of land use types and densities), referred to loosely as TDM+ is gaining steam as being a critical element to influence travel behavior and provide people with realistic alternatives to driving alone.



WHO SHOULD BE INTERESTED IN MANAGING TRAVEL DEMAND?

TDM measures can be implemented and managed by many different types of organizations, from state, regional, and local agencies, to Universities, to independent office buildings. In most places across the country, the local Metropolitan Planning Organization (MPO) provides subsidies and support services for local communities through funding from the Federal Government. There are; however, many other groups and organizations that play a role in creating travel demand, therefore, having an inherent interest in managing our transportation infrastructure efficiently. Organizations chose to implement TDM measures for various reasons. If your organization deals with any of the following, you may be interested in exploring developing or expanding your TDM offerings:

- Concern of parking infrastructure costs (capital and long-term maintenance)
- Concern of your carbon footprint
- Limited parking supply and rising parking costs
- Need for future expansion with limited space
- Traffic congestion

While most organizations can participate in the TDM conversation, the following groups are typically those with the largest ability to distribute and coordinate TDM offerings and have a well-defined TDM program:

Governmental Agencies (States, Metropolitan Planning Organizations (MPOs), Cities and Counties)

Quasi-Public/Private Governmental Agencies (Community Improvement Districts [CIDs], Business Improvement Districts [BIDs], Downtown Development Authorities [DDAs] and Transportation Management Associations [TMAs]

Colleges and Universities

Healthcare Systems

Business Parks and Corporate Campuses

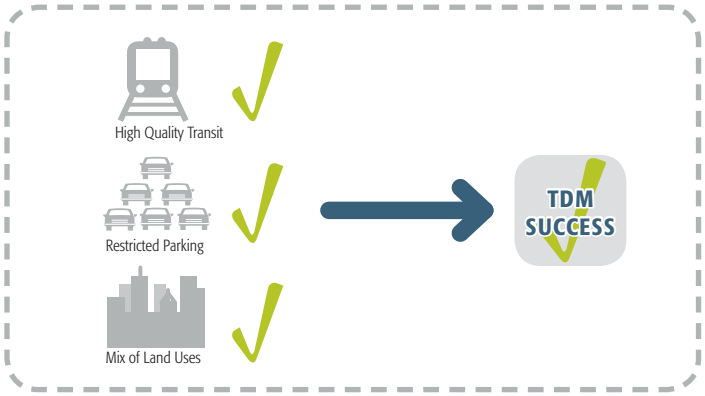
Special Districts or Areas with Concentrated Employment and Communications (Sports Districts, Resort Areas, Airports, etc.)

CHANGING TRAVEL BEHAVIOR AND FACTORS AFFECTING TDM MEASURE EFFECTIVENESS

There are several factors that inherently predetermine how much success an organization can have when it comes to shifting the travel behaviors of its employees, students, or other constituents. These primarily are:

- Local and Regional Transit Availability
- Presence of Restricted Parking
- Adjacent land uses on-site or within ¼ mile
  - Shopping
  - Restaurants
  - Banks
  - Childcare

A site located in an area with convenient transit, restricted parking and a mix of land uses will most likely have lower single-occupant-vehicle travel than a site without; likely without even extending additional TDM offerings to employees or students. While this is the case, there are a multitude of strategies with various investment requirements that can be deployed, to affect travel behaviors. The list of TDM strategies provided in the following section provides a range of options. for creating a package of measures customized for the local context of the site.



BENEFITS OF REDUCING TRAVEL DEMAND

The benefits of reducing dependence on the automobile are extensive, not only to an organization, but for the larger community as a whole. They can be described in the following categories.

Transportation System Benefits

- Reduced traffic congestion, resulting in time savings
- Multiple transportation options, enhancing overall access, convenience and mobility equity

Social Benefits

- Improved quality of life in communities with transportation options (walkable and bikeable)More opportunities for spontaneous social interactions and connectedness to community
- Reduced community fragmentation and safety issues caused by wide, high-speed roads
- Allowing aging population to remain in community and retain independence

Environmental Benefits

- Reduced dependence on fossil fuels and reductions in greenhouse gas emissions
- Improved air quality
- Reduced congestion and energy consumption
- Improved water quality (reduced polluting emissions and fluid leaks)
- Reduced heat dome effect (reduced need for paved surfaces)

Health and Safety Benefits

- Fitness benefits of active transportation (biking and walking)
- Health benefits of improved air quality
- Stress reduction

Economic and Financial Benefits

- Reduced costs of car ownership and maintenance
- Reduced cost of parking
- Reduced cost of expensive regional vehicular infrastructure that yield lower return on investment than transit investments
- Attracting individuals that value a multi-modal environment, individuals that represent much of the work force
- Reduced cost of healthcare (over the long-term)

TDM STRATEGIES, EFFECTIVENESS AND RELATIVE COSTS

The following table provides a list of actions aimed to impact traveler behavior by reducing the number of single-occupant vehicle trips. The table also provides guidance on each strategy's ability to influence behavior (a factor known as the Employee Vehicle Trip Reduction (VTR) Impact), as well as relative cost.

TDM STRATEGY	DESCRIPTION	PROPENSITY TO AFFECT BEHAVIOR	RELATIVE COST TO IMPLEMENT
EMPLOYER OR INSTITUTIONAL SUPPORT ACTIONS			
Transportation Coordinator	Professional located at Transportation Management Association (TMA), employment site, or university campus that provides personalized trip planning and assistance to commuters.	High	Moderate
On-Site Services/Amenities	Provided on-site or within convenient walking distance Childcare, Gym/Recreational Facilities, Dining/Food Service, Grocery, Post Office, etc.	High	High
Employer-Assisted Transit Service			
Peak Period Shuttles	Shuttle operations during peak commute periods, typically connecting the site with regional transit or off-site parking. Typically contracted to a transit/shuttle provider, depending on available resources.	High	High
Mid-Day Shuttles	Shuttles operating during mid-day periods in order to provide mid-day transportation for individuals that do not drive to work/school. Typically contracted to a transit/shuttle provider, depending on available resources.	High	High
Car Sharing	Providing company/Institutional vehicles or car rentals on site to facilitate primarily mid-day travel for individuals that do not drive to work/school.	High	Moderate
On-Site Mobility Concierge (Commuter Info Center)	Conveniently located and visible professional(s) and/or kiosk(s) providing and/or educating on traveler information tools, including intelligent transportation systems, mobile and social applications, wayfinding tools, and other methods for promoting non-SOV modes.	Moderate	Moderate
TDM Branding and Marketing	A well-known and recognized brand and outreach program, particularly if TDM strategies and programs are housed under the same institution or as part of a collaborative, heightening awareness and providing opportunities to educate residents and commuters about travel options.	Moderate	Low
New Hire Orientation	Orientation to take place prior to hiring or starting school (if possible) to educate new employee or student of alternative transportation options and costs. Aimed to influence decision on where to live, how to travel to school or work, or make other decisions regarding travel options.	Moderate	Low
Multi-Modal Navigation Tools	Mobile apps allowing users access to wayfinding resources and other multi-modal navigation tools.	Moderate	Moderate
Address Security Concerns	Improve security by investing in strategically located cameras, security guards and other measures.	Moderate	Moderate
Rideshare Matching Services – Carpool	Puts compatible commuters in touch with one another to enable commute-related ridesharing. Employers/institutions are at a particular advantage to encourage and match commuter carpools and vanpools, since the work destination is a commonality.	Moderate	Low
Rideshare Matching Services – Vanpool		Low	Low
Fairs/Promotions	Periodic events held in public spaces to highlight TDM offerings.	Low	Low
Guaranteed Ride Home	Backup ride home to employees/students who do not drive alone to work/school that have a sudden need to return home or work late. Typically provided through vouchers and/or reimbursement up to a designated number of times per period.	Low	Low
Preferential Parking	Premier parking designated to rideshare users (carpool or vanpool), particularly in areas where parking is limited, or where having a reserved spot close to the entrance can be a great advantage over other available parking.	Low	Low
Bicycle Storage, Lockers, Changing Facilities and Showers	Conveniently located, covered and secure facilities.	Low	Moderate
Lobby Amenities	Umbrellas, rain jackets and other items to facilitate midday walking trips during inclement weather.	Low	Low
Bicycle Loan Programs	Locating bicycles conveniently on site to allow employees/students to reduce the need for certain mid-day trips via vehicle. Easy access to a bicycle can aid trip making to other on-site locations or nearby commercial/retail opportunities by alternative mode.	Low	Moderate
Site Design			
Alternative mode options visibility	Site design that focuses visibility and convenience of using alternative modes of travel by showcasing options in easily accessible and high volume areas.	Low	Moderate
Passenger loading areas	Sites that accommodate passenger loading zones, such as taxi and Uber, increasing in importance due to the popularity of app based on-demand ride share.	Low	Moderate
ALTERNATIVE WORK ARRANGEMENTS			
Telecommuting	Arrangement for employees to work at remote locations one or more days per week rather than commuting to the work site. Technology plays an important role in telecommuting, since many employees will need to maintain a virtual connection with the worksite in order to access necessary information and/or people.	High	Moderate
Flexible Work Hours	Allow employees a degree of freedom to choose their clock-in/clock-out times. Core hours can be required in order to maintain a certain amount of the work-day when face-to-face interactions, collaborations, and meetings can be scheduled without conflicting with flexible start and end times.	Moderate	Low
Staggered Work Hours	Good for large facilities, where work schedules are otherwise very regular, and can cause long lines to arrive and depart from the facility. Individual groups may be assigned to fixed times that they arrive and depart, typically over a 1-3 hour period	Moderate	Low
Compressed Work Week	Allow employees to work fewer days per week, or over a two-week period, by increasing the number of hours worked per day. Common schedules are 9/80, where employees work 9 hours per day, and get the 10th day off, and 10/80, where employees work 10 hours per day and get the 5th day off.	Moderate	Low

TDM STRATEGY	DESCRIPTION	PROPENSITY TO AFFECT BEHAVIOR	RELATIVE COST TO IMPLEMENT
FINANCIAL INCENTIVES OF DISINCENTIVE			
Transit Subsidies	Reduced cost of transit by offering prepaid or discounted transit passes to employees/students who agree to commute primarily by transit. Cost sharing can be done in various ways including employer/university subsidized, transit agency subsidized, shared cost partnerships or variations of each. Federal tax law allows employees to receive a transit subsidy without incurring tax liability for the benefit and some states also offer the employer a tax credit	High	Moderate
Parking Supply and Pricing			
Restricted Parking	The use of restricting certain users from using parking in order to reduce the amount of parking needed. For example, Freshmen at a university or new hires at an employment site.	High	High Cost Savings (doesn't cost employer/ university)
Parking Fees	Charging for parking. This is one of the most effective ways at affecting travel behavior. The financial cost of providing parking is very high, and often not known by users. Passing along the cost of parking can both educate users of the true cost of driving and impact their decisions .	High	High Revenue
Unbundled parking	Requiring users of parking to pay the costs directly, as opposed to sharing the costs indirectly with others through increased rents and tax subsidies.	High	Moderate Revenue
HOV Parking Discounts	Reduced or free parking for carpool or vanpoolers.	Moderate	Low
Parking Cash Out	Provide an option for employees and/or students to exchange the privilege of a free parking space for the cash equivalent, which they may then be used flexibly to defray the cost of other transportation options including transit, walking or biking.	Moderate	Moderate
Time off with Pay	Offer additional paid time off for participating in an alternative commute program.	Moderate	Moderate
Reduced Healthcare Premiums	Employer/institute subsidized healthcare premiums for those that take transit, walk or bike to work.	Moderate	Moderate
Living Allowances	Housing vouchers for those choosing to live within transit accessible/walking/biking distance to work/school, and chose not to drive.	Moderate	High
Vanpool Program/ Subsidies	Employers/universities can consider a start-up (empty seat) subsidy to support a vanpool during its formative stage to keep costs down for initial riders. They can additionally offer short-term promotional or long-term fare subsidies, as well as driver subsidies to help promote ridership	Low	Low
Carpool Incentives/ Subsidies	Offering subsidies (either employer/university or MPO rewards pass-throughs) to riders who chose to carpool. Coupling this with ridematching services and preferred parking can be an attractive option for individuals.	Low	Low
Bike/Walk Subsidy	Subsidies such as a show allowance can provide an added incentive to walk for individuals living within walking proximity to work/university.	Low	Low
In-Kind Incentives (in lieu of cash)	Free or discounted products or services may be given in lieu of cash. For example, carpoolers and vanpoolers might receive gas or oil changes, transit riders might receive transit passes, walkers could be provided with shoes, and bicyclists might receive bicycle accessories. etc.	Low	Low
Transportation Allowances	Provide a sum of money that can be used at the employee's discretion toward the cost of his/her chosen commute option. The amount is not necessarily related to the employer's cost for parking.	Low	Moderate
Company Recognition (Gaming Theory)	Non-financial based rewards programs that promote alternative transportation options through public announcement of individual performance.	Low	Low
LOCAL AND REGIONAL INFRASTRUCTURE AND POLICY			
Local Land Use Changes	Requiring a mix of complementary land uses near employment centers and universities in order to allow for needed commerce to occur via transit, bicycle and pedestrian related trips. Emphasis of available/affordable housing near employment sites.	High	High
Public transportation improvements	Improving public transportation infrastructure, such as subway entrances, bus stops and routes.	High	High
Transportation Management Association (TMA)	Associations of public and private entities concerned with traffic congestion and transportation issues in specific geographic areas. TMAs use funds collected to increase the use of ridesharing and other commuting options that reduce traffic congestion and improve air quality. TMAs may also advocate with local governments on behalf of membership.	High	High
Road Pricing/Tolls/ Congestion Pricing	Road pricing tolls during peak hours. Usually done by regional and state agencies to manage large transportation systems during peak congested times.	High	High
Road Space Rationing	Road space rationing by restricting travel based on license plate number, at certain times and places. Rarely done in the U.S., but experimented with in places like Europe.	High	High
Time, Distance and Place Pricing (TDP)	Road users are charged based on when, where and how much they drive. Some transportation experts believe TDP pricing is an integral part of the next generation in transportation demand management.	High	High
Carbon Taxes	Special taxes based on fuel carbon content intended to encourage energy conservation and climate change emission reductions.	High	Low
Fuel Taxes	Increasing fuel taxes to achieve TDM objectives.	Moderate	Low
Pay-As-You-Drive Insurance	Converting vehicle insurance premiums into distance-based fees.	Moderate	Low
Community Bicycle and pedestrian infrastructure	Providing active transportation facilities including bike lanes and multi-use trails to connect employment centers/universities with housing and commercial land uses.	Moderate	High
Traffic Calming	Implement traffic calming measures throughout community to reduced vehicular speeds and encourage safe travel by bicycle and walking.	Moderate	High
On-Demand Ridesharing	Is growing through the use of social networking and telecommunications. Mobile apps such as Zimride, Lyft and Uber provide platforms for drivers to connect with people who need a ride.	Moderate	Low

PUTTING TOGETHER A PROGRAM

TDM programs vary in all sizes, shapes and forms; from a robust statewide program, to a few incentives provided by an individual property owner. All programs do, however, share commonalities regarding the thought process used to develop the program.

Step 1: Determine a Management Structure

- Define and organizational structure with committed leadership
- Develop a staffing plan to administer the TDM strategies to be deployed
- Define key stakeholders to periodically engage in overall direction of program

Step 2: Identify a Budget

- Determine funding sources and outline how monies can be spent
- Develop a budget with flexibility to increase over time as measures prove to be effective

Step 3: Develop Goals and Objectives

- Identify current challenges and issues that need to be addressed
- Determine objectives of the program, who will be targeted and what outcomes are expected

Step 4: Set Performance Metrics

- Set metrics that will be evaluated on an ongoing basis (e.g. number of people enrolled in program, reduction in parking pass sales, etc.)

Step 5: Develop a Brand and Marketing Protocol

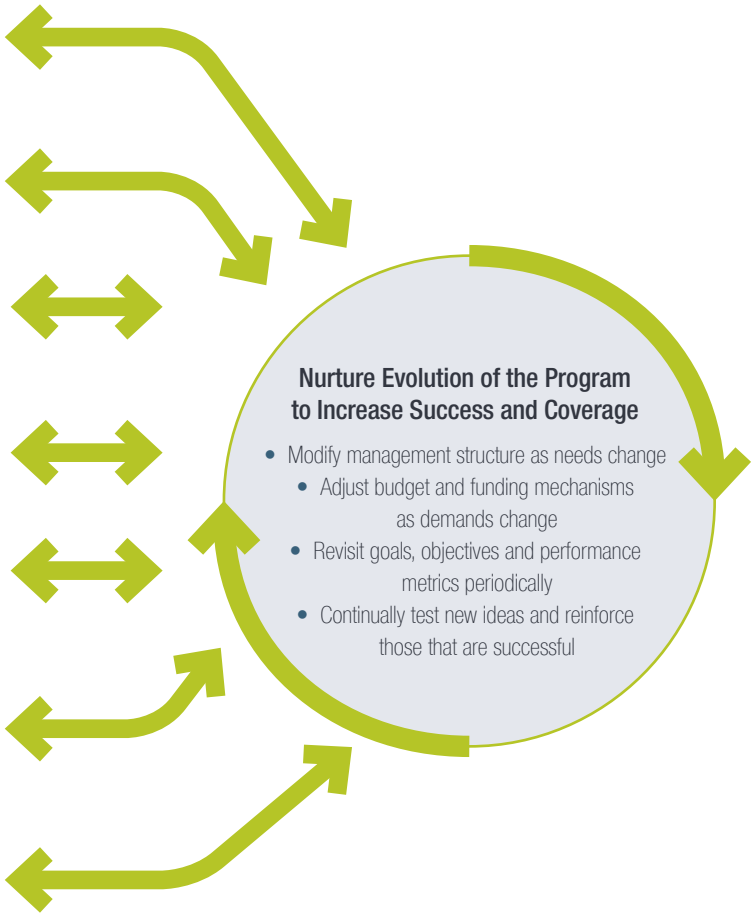
- Develop a brand that represents the goals and objectives of the plan
- Develop marketing and PR protocols that advertise the program on an ongoing basis
- Develop a website to serve as the central location for information regarding the program

Step 6: Develop and Implement TDM Strategies

- Develop a series of phased strategies gathered from ideas presented in this Quick Guide
- TDM program are ever evolving, develop a list of strategies that enhance each other and can be phased in and out based on their level of success

Step 7: Create an Annual Monitoring Program

- Conduct a yearly survey (at a minimum) to poll attitudes from program users of program offerings and new ideas
- Document program performance against performance metrics
- Define strategies to enhance the program based on feedback and data



ADDITIONAL RESOURCES AND RELEVANT ORGANIZATIONS

The information presented in this Quick Guide was compiled from multiple sources, primarily taken from TCRP Report 95: Chapter 19 "Employer and Institutional TDM Strategies: Traveler Response to Transportation System Changes" (Transportation Research Board, 2010). There are many other organizations that provide extensive resources, documentation and tools to evaluate TDM measures, including the following:

- Association for Commuter Transportation (http://actweb.org/)
- Center for Urban Transportation Research (CUTR) at the University of South Florida (http://www.cutr.usf.edu/)
- Mobility Lab, Arlington, VA (http://mobilitylab.org/)
- U.S. DOT Federal Highway Administration (http://www.fhwa.dot.gov/)
- Victoria Transport Policy Institute (http://www.vtpi.org/)
- Wikipedia (https://en.wikipedia.org/wiki/Transportation_demand_management)

LET US HELP

Putting together a TDM program can seem daunting. Let us help you develop a plan tailored to your organization.

Contact Jeffrey Smith at **jeffrey.smith@kimley-horn.com** to get started.

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TRANSPORTATION DEMAND MANAGEMENT QUICK GUIDE

Appendix 34

Developing a Retail Parking Support Strategy

Appendix 34

Developing a Retail Parking Support Strategy

The provision of short-term, retail supportive parking is a key issue to encourage and strengthen the resurgence of downtown Norman. Specific strategies and approaches are outlined below.

Characteristics of Effective Retail Parking

Revitalizing retail in a downtown setting is one of the most difficult elements of downtown revitalization to get right. Convenient, plentiful and easily accessible parking is especially critical to the success of retail in a downtown area.

What is often overlooked or underestimated in retail revitalization projects is a comprehensive "retail parking strategy". In many cases this will involve significant investment in new parking infrastructure or at least a restructuring or reallocation of existing parking resources. Once the parking supply issues have been addressed, a wide range of parking management strategies should also be considered.

Taking a comprehensive approach to downtown retail parking is important because of the significant differences in the downtown environment compared to "the competition" i.e., suburban malls or the big box store approach. The suburban malls and big box stores have several obvious advantages over downtowns.

- Plentiful land on which to provide cheap (perceived as free) surface parking
- Simple, easily understood access characterized by direct line of sight from the parking lot to the store(s)
- Generally high levels of service as expressed through short walking distances, more generous parking stall widths, etc.
- Single ownership/control and dedicated parking resources
- More ability to control employee parking behaviors through direct management

Downtowns have, in recent years, seen unparalleled success in their revitalization efforts. It is interesting to note that this success has not gone unnoticed by the shopping center industry. They have adapted their strategies to stay competitive. There is only one enclosed (now considered "old style") mall under construction in the US this year. The new trend for shopping centers is "Life Style Centers". These new shopping destinations emulate the character and features of "genuine downtowns" or "main streets". They often have all the amenities of downtowns and few of the "warts". The worst that can be said of them is that they lack that ineffable quality that comes with time, history and the diversity of a real downtown. They may feel inauthentic and "cookie cutterish". However, they usually have plentiful, well located and (very often) free parking.

While we can rarely start with a "clean slate" in downtown environments when it comes to parking, there are some basic principles relative to effective retail parking strategies that can be employed to give retail a fighting chance in the downtown. The key elements of a downtown retail parking strategy are outlined below:

I. **On-street Parking** – As the most conveniently located parking assets (and therefore the most valuable), effective management of on-street parking is critical. This generally includes:

- On-street parking being prioritized for short-term, visitor parking.
- On-street parking being priced higher than off-street parking.
- Having an effective and consistent parking enforcement function – the primary goal of which is to enforce the rules designed to promote on-street space turnover.
- Having an effective combination of time-limits to support the specific uses on downtown retailers. For example, coffee shops and dry cleaners have different needs than restaurants and clothing stores.
- The use of easy to read/color-coded time-limit stickers on meters is a simple but important tool that lets drivers know the time-limit of an on-street space before pulling in to park.
- Having an effective downtown loading zone plan to support retail deliveries.
- Implementing a fine structure for on-street parking that is more forgiving to the occasional violator and more aggressive toward the real problem – repeat long-term parkers taking up what should be short-term parking.
- Defining a well-developed legislative framework that supports enforcement practices (such as having a local ordinance that requires vehicles to move more than 1 block face after moving from one time-limited space to another.)
- The use of new parking enforcement technologies to improve the efficiency and effectiveness of enforcement efforts, such as computerized parking enforcement hardware and software programs and mobile license plate recognition systems with GPS capability.
- Consistent but unpredictable parking enforcement routes.
- A combination of on-street parking rates, fines and enforcement that ultimately promotes a consistent 15% vacancy rate for on-street spaces. Having a 15% on-street vacancy rate is considered important because it makes the downtown area appear to be more accessible and encourages potential customers to stop and shop if they see a well-designed storefront that appeals to them.
- In combination with the strategy above, providing signage about the availability of off-street retail parking is also important so that customers feel they have choices.
- The use of new on-street parking meter technologies that provide more customer-friendly payment options (this can either be multi-space meter or new single space meters that accept credit or debit cards) is becoming a primary strategy for downtowns. This has been aided by technological advances that incorporate wireless communications and solar power to reduce system installation costs.

II. **Off-street Parking** – In a downtown environment the primary issues related to retail parking are to provide large, easy-to-find reservoirs of parking within close proximity to the retail cores or corridors. Small pockets of off-street parking may be useful for those who frequent the downtown area, but these resources are not adequate to effectively support a successful retail “hot spot”. Specific issues for retail parking include:

- As much as practical, retail parking reservoirs should be located within line-of-sight of the retail anchors and very convenient to the contiguous retail corridors.
- The street level of retail parking structures should be designed to maintain the street-level activation of the area by incorporation retail into the at-grade level. To support this primary design criterion, higher first floor heights should be planned.
- To the greatest degree practical, designing for a higher parking facility level of service of "user comfort factor" is recommended. Creation of a defined set of parking garage design criteria with higher levels of service for short-term retail is recommended. These design criteria include such items as more generous parking bay and stall width dimensions, end-bay turn radii, floor-to-floor heights, enhanced lighting, etc.
- For a parking facility that is specifically designed to support a retail patronage, "user comfort factors" of A or B are recommended (high ease of use standards).
- Direct connections from the retail parking structure to a retail anchor (via sky bridge, for example) are desirable features.
- The perception of safety and security is critically important for a retail parking facility. Recommended design strategies for improving parking facility security include: glass-backed stair and elevator towers, adopting enhanced lighting levels (in excess of IES minimum requirements), painting interiors white to improve lighting reflectivity and enhancing the feeling of openness, securing the areas beneath stairwells, etc.
- Effective wayfinding and facility signage is essential. Parking signage should be a significant element of a comprehensive wayfinding program. As we do a better job of architecturally incorporating parking into mixed-use facilities, sometimes we "hide the parking" too well. Because of this, enhanced parking facility entrance signage is also very important.
- Other interior facility enhancements such as creative level-theming concepts, interior wayfinding and level identification signage can also help make garages more colorful, visually interesting and aid patrons by making it easier to remember where they parked. This approach can also be used to connect with other community groups – for example some communities engage local artists by using garage level theming projects as art competitions. Similar projects include turning bike racks and bus stops into opportunities for community art.

III. **Overall Parking Management** - From a management and operations perspective, there are many effective strategies that downtown parking programs can employ to better support the larger community's strategic goals. Parking programs too often become focused on parking facility revenues or enforcement quotas to justify their programs. The best programs are those with a broader perspective and that align their policies to help the communities they serve achieve success. Often, by doing this, they achieve an even higher level of success themselves – both in terms of stimulating additional traffic (and therefore parking revenue) and also by becoming a valued and integral partner in the success of the downtown. The following is a short-list of strategies to frame the possibilities:

- Programs such as a "First Hour Free" for off-street public parking facilities can make downtown appear more visitor friendly while providing both a more equitable program and simplifying the administration of traditional parking validation programs. While we support programs such as "First Hour Free" as an element of a larger downtown revitalization initiative, we recognize that paid parking in a downtown environment is a basic economic reality. We support the philosophy that "Parking should be friendly – not free". In one community where the "First Hour Free" program was enacted, parking rates were reassessed after four years. The downtown stakeholders were given a choice of no rate increase, but elimination of the "First Hour Free" program and they unequivocally wanted to keep the "First Hour Free". This intrigued us enough to do some more research. It turned out that in the four years the "First Hour Free" had been in effect, downtown sale tax revenues had doubled and the average parking transient length of stay had grown from 2.11 hours to 3.56 hours. Not all of this is direct attributable to the "First Hour Free" program, but the downtown merchants credited the program as one of the key elements to the revitalization of the downtown.
- Another positive trend in the industry is the reinvestment of a portion of on-street and enforcement parking revenues back into the districts from which they were generated. This reinvestment can take the form of financial contributions to downtown organizations to promote the marketing of the district, investment in specific district projects such as wayfinding projects, area wide Wi-Fi, flower basket programs, pop jet fountains, banner programs, etc. This reinvestment makes the districts more attractive and customer friendly and therefore more successful. It also makes the local merchants more tolerant of needed paid parking and enforcement programs, because they see the benefits of not only the increased on-street space turnover, but also tangible downtown improvements that their customers appreciate.
- In off-street retail parking facilities, the lower levels (or more accurately, the most convenient parking areas) should be reserved for retail customer use. Employees or other groups should be assigned to park in other areas of the facility. Depending on the facility design, enforcement of these allocation strategies can often be enhanced through the use of what is termed "nested parking areas" using access control gates and card readers.
- Improving the training and customer service of frontline parking employees can have a huge effect because of all the individual "touches" parking staff make with the public on a daily basis. Training parking staff (cashiers, maintenance and enforcement staff) to adopt the role of "downtown ambassadors" rather than just parking attendants is a key attitude shift that should be actively promoted.
- Painting the interior of parking facilities and adding color (either through level theming graphics or even advertisements) can enhance parking facility interior environments and make facilities feel brighter and safer. Generally speaking, parking facilities have been treated as very utilitarian structures – at best they were dull, grey and functional. At worst, they were dark, scary and dangerous. Investment in parking facility interior facility enhancements is part of making downtowns a more interesting and attractive destination.

- The use of newer technologies and more customer friendly parking access and revenue control systems can reduce wait times upon exiting and improve customer service by providing more convenient customer payment options.
- These days there is a both a “real world” and a “virtual program identity” on-line. Enhancing parking websites with effective tools such as interactive parking maps, on-line payment options, parking rate, special events and other information is expected these days. An important “best practice” in this area is a website that provides a comprehensive overview of downtown including retail and restaurant offering, cultural and special event venues and of course parking and transportation info. The best websites have an overall map of the downtown with the ability to turn on each of the elements above as a “map overlay”.
- Leveraging all of these program enhancements into a recognizable parking “Program Brand” can make people associate all the program enhancements with the public parking facilities and therefore they are more comfortable with downtown parking. Some communities even have radio ads promoting their parking system. In some communities, the public parking programs have made such noticeable strides forward that all the private parking operations were forced to also raise the standards of their operations. We call this the “high tide raises all boats” phenomenon.

Appendix 35

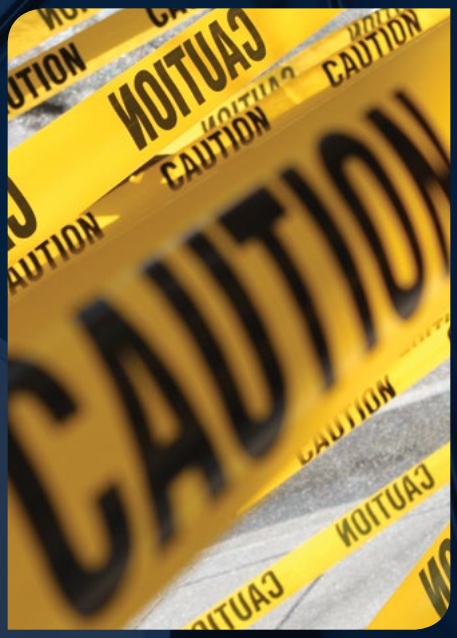
IPI Emergency Preparedness Manual

An often-overlooked element of parking system management is the development of an Emergency Preparedness Manual.

IPI recently published an excellent template for such a manual. Appendix 35 provides a copy for the County/City's team to review and use as a guide for developing a manual customized to their needs.

INTERNATIONAL PARKING INSTITUTE™

EMERGENCY PREPAREDNESS MANUAL



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PREFACE

Photo: Elvert Barnes Photography

Parking and transportation professionals go to work every day knowing in any given moment an emergency could turn things upside-down.

A vehicle fire could require rapid evacuation of an underground parking garage. Mother Nature could decide to throw an earthquake, tornado, flash flood, or other unexpected natural event near a facility. Then, there are the emergencies we usually get a little warning about — hurricanes, tornadoes, and blizzards.

We all live with heightened awareness that a terrorist could wreak havoc without warning. Images from such attacks are indelibly marked into our collective memory: from Oklahoma City to the Boston Marathon in 2013.

As parking and transportation professionals charged with the safety and welfare of our customers and stakeholders, we have only one responsible choice: prepare and plan.

This Emergency Preparedness Manual is a great example of how IPI's committees work to anticipate members' needs. The IPI Safety & Security Committee created a parking and transportation-specific reference tool that will directly benefit you in your operations.

There's no question we in parking touch lives: those of our employees, our parking customers, our transportation system users, and many others. Parking and mobility management play an important role in every community, and our professionals stand front and center when emergencies arise.

Let's make sure we do the best we can to be prepared. And on behalf of IPI, my thanks to the Safety & Security Committee for its valuable work toward that goal.

Shawn Conrad, CAE
IPI Executive Director

FOREWORD

As co-chairs of the IPI Safety & Security Committee, we are proud to have been involved in the development of this Emergency Preparedness Manual. Emergency planning is vital for all segments of the parking industry. The development and subsequent implementation of a sound emergency plan is critical to the successful response and mitigation of an event.

As parking and transportation professionals, both of us arrived at an intimate understanding of the role emergency planning and management plays through different — but equally consequential — paths in our careers. We present to you the following insights gleaned from our own experiences.

Bruce Barclay, CAPP, *Operations Manager, Salt Lake City Department of Airports*

Geary L. Robinson, PhD, CAPP, *Director, Parking & Transportation Services, University of North Texas*

INTRO LETTERS

The need for a solid emergency plan did not hit home for me until a day that changed my life and the lives of many other Americans: the tragedy of Sept. 11, 2001. I had been in the parking profession for about eight years at the time and didn't realize the effect an emergency situation could have on a city/airport/university until then.

On Sept. 11, 2001, I was general manager for the parking contract at Newark International Airport. My client was the Port Authority of New York and New Jersey. I attended regular meetings at 1 World Trade Center — known then as the North Tower, the first building hit by the hijackers, at 8:46 a.m. Eastern time. The South Tower was hit at 9:03 a.m. and burned until it collapsed at 9:59 a.m. The North Tower was in flames until 10:26 a.m. — 102 minutes. Then it collapsed.

Ironically, the North Tower's collapse severely damaged World Trade Center Building 7, one of whose tenants was the New York City Office of Emergency Management. Imagine living through the onset of the world's largest human disaster and not having the technical infrastructure required to coordinate rescue and recovery efforts.

When events unfolded in Lower Manhattan, we experienced major disruptions at Newark International. After the planes hit the towers, reports came in about bombs set to explode in one of Newark's terminals. The terminals were evacuated. People fled to their parked cars and scrambled to leave, but the exit plaza was clogged with vehicles queued well back into the parking lots. In the interest of public safety, we opened the gates and allowed everyone to exit without charge. (Port Authority staff was tied up with immediate events but later concurred with our decision.) At 9:40 a.m., the Federal Aviation Administration grounded all U.S. aircraft, which precipitated another mass exodus of passengers, many of whom were in a state of panic and shock.

Rumors spread like wildfire that morning. No one knew what was truth and what were rumors surrounding the attacks or the events unfolding at Newark. One rumor claimed that flights were grounded because there were bombs on additional planes at Newark International. Indeed, many assumed that the massive fireballs generated during the crashes into the Twin Towers came from explosives on those aircraft. This fed the rumors of other planes with bombs.

Two memories from that day will stay with me forever: first, the crystal-clear blue sky and the smoke rising from the towers to the east. Second, the eerie silence of no planes taking off and landing as the day wore on.

Bruce Barclay, CAPP, *Operations Manager, Salt Lake City Department of Airports*

Photo: Penn State

Photo: Michael B.

As I wrote in the opening paragraphs of my doctoral dissertation (*Disaster Preparedness For University/Community Transit Systems, Clemson University, May 2011*), public transportation, along with parking assets and their open access, creates an opportunity for masses of people to be hurt during human-made or natural disasters.

My doctoral research focused on two questions:

1. How are universities/communities planning on using and protecting transit systems in a disaster event?
2. How are universities/communities planning on using and protecting transit assets in a disaster event?

My hypothesis at the outset of that research was that university/community transit systems do have appropriately prepared emergency operating plans. The research I conducted, however, did not support my hypothesis.

During my dissertation research, my analysis of survey results showed that university/community transit systems do not comply with the National Incident Management System (NIMS) and do not have appropriately prepared emergency operating plans. All institutions of higher education, other post-secondary educational institutions, transit and parking organizations, as well as private/public and non-governmental/governmental organizations, should develop comprehensive and holistic emergency operations.

Public and private transportation assets have been designated as a part of the nation's critical infrastructure and key resources (CIKR), which includes university and community transit systems owned by or used to provide transit services to post- secondary institutions of higher education. The transit industry's lack of involvement with emergency management agencies and the lack of disaster/emergency experience within the transportation community have caused some of the nation's most knowledgeable and useful resources for information regarding the use of transportation resources for emergency conditions to be underutilized (Wolshon 2009).

Additionally, Directive 8 of the Homeland Security Act of 2002 (6 U.S.C. 101) mandates the use of NIMS for all local, state, or federal agencies receiving federal funding, while the Federal Transit Administration (FTA) only provides recommendations in the form of a technical resource for its grantee transit agencies. This FTA assistance may also be used by non-federally funded transit systems.

This manual includes an overview of NIMS and provides references so readers can avail themselves of further information resources provided by the U.S. Department of Homeland Security and others.

As I concluded from my research, the following key issues need to be kept in mind when developing or revising a university/community transit system emergency operating plan:

1. Senior management of all participating organizations must not only be committed to the effort but also dedicate the needed resources, including funding.
2. Those involved with the implementation of the plan, including the transit system's director or designee, must be part of the planning process.
3. The plan must incorporate the university/community transit system(s).
4. Training in various forms (tabletop exercises, drills, etc.) needs to be part of the plan.
5. A comprehensive assessment process must be included as an essential part of the plan.

This emergency preparedness manual includes as one of its appendices an outline (i.e., the table of contents) of the emergency operations plan I drafted as part of my dissertation. I hope it serves as a useful guide to the many elements such a plan may contain as you explore an appropriate emergency planning process for your institutions of higher education, other post-secondary educational institutions, transit and parking organizations, as well as private/public and non-governmental/governmental organizations.

Geary L. Robinson, PhD, CAPP, *Director, Parking & Transportation Services, University of North Texas*

INTRODUCTION

Who Needs this Manual?

The U.S. Department of Homeland Security (DHS) and Federal Emergency Management Agency (FEMA) define preparedness as "a continuous cycle of planning, organizing, training, equipping, exercising, evaluating, and taking corrective action in an effort to ensure effective coordination during incident response. This cycle is one element of a broader National Preparedness System to prevent, respond to, and recover from natural disasters, acts of terrorism, and other disasters." (Source: dhs.gov/topic/plan-and-prepare-disasters)

FEMA released its National Preparedness Goal in September 2011 to define what it means for the whole community to be prepared for all types of disasters and emergencies.

The National Preparedness Goal (included in the appendix of this manual) identified five mission areas and 31 core capabilities, defined as the distinct critical elements needed to achieve the goal.

This manual was developed as a hands-on preparedness tool for parking and transportation professionals. Regardless of your title or experience level, you have organizational and individual responsibilities to fulfill during an emergency.

Organizationally, professionals own specific functions and tasks during an emergency event. A department director will need to do x, y, and z, while a shuttle bus driver will attend to a, b, and c. Job-specific tasks ensure that the entire parking and transportation operation functions appropriately and effectively in an emergency.

Individually, emergency situations require quick action. For example, the first person on-scene at a garage fire needs to know what to do — and then do it — when someone stumbles out of the smoke and collapses.

Being prepared for an emergency requires having the knowledge, skills, policies, and procedures in place to not only fulfill departmental roles but also function professionally and sensibly in unexpected scenarios.

The parking industry is ever-changing and subject to ongoing changes (e.g., building relocations, new construction, etc.), it is recommended that you reevaluate your plan on an annual or regular basis with those who are directly involved or affected.

IPI adopted a broad approach in developing this manual. This is a tool intended to emphasize practical and actionable steps, rather than theory. Moreover, IPI recognizes that planning specifics will

Photo: Jeremy Brooks

vary depending on the differing environments and roles of parking and transportation departments. Responses to emergencies affecting freestanding garages, for example, will vary from responses to emergencies affecting underground garages.

An emergency preparedness plan should be part of an institution's larger safety and security plan. This manual is best used as a resource for making your own plan. It might also spark other conversations about overall safety, security, and continuity of operations..

Here are 10 suggestions for making the most of this manual:

1. Review it thoroughly, considering your operation.
2. Identify the elements that apply to your operation.
3. Share those elements with your colleagues and your organization's Emergency Management Team.
4. Compare the sector-specific sample plan with the roles and people in your own operation.
5. Establish a schedule to develop your own plan.
6. Arrange for your team to own specific preparedness planning tasks.
7. Involve other internal and external stakeholders in the plan's development and review.
8. Implement the plan.
9. Practice the plan and evaluate practice sessions after they occur.
10. Update the plan annually.

Your Feedback Requested

This is the first emergency preparedness manual published by IPI. While the manual's content is intended to be as "evergreen" as possible, your comments to IPI's Safety & Security Committee will help inform any future updates. For more information about the committee, visit parking.org/about-ipi/committees/ipi-safety-and-security-committee.aspx.

Learning about the National Incident Management System (NIMS)

As you begin to think about emergency preparedness planning for your parking and transportation operation, the IPI Safety & Security Committee recommends becoming familiar with the National Incident Management System (NIMS).

Created by DHS and FEMA, NIMS is, in FEMA's words, "a comprehensive, national approach to incident management. NIMS provides the template for incident management, regardless of cause, size, location, or complexity. NIMS is applicable at all jurisdictional levels and across functional disciplines."

According to FEMA, the benefits of NIMS include:

- Standardized approach to incident management that is scalable and flexible.
- Enhanced cooperation and interoperability among responders.
- Comprehensive all-hazards preparedness.
- Efficient resource coordination among jurisdictions or organizations.
- Reflects best practices and lessons learned.

NIMS focuses on five key components:

- Preparedness.
- Communications and information management.
- Resource management.
- Command and management.
- Ongoing management and maintenance.

The NIMS Resource Center (fema.gov/national-incident-management-system) offers online resources to implement and maintain NIMS concepts and principles. Coordinating with other NIMS stakeholders is imperative for proper preparedness. A parking and transportation department at a university, for example, will need to coordinate with campus security or its police department and the emergency management team, as well as specific administrators who have public safety and public communication responsibilities, along with off-campus stakeholders such as fire/EMS and transit. A municipal parking department would need to coordinate with police, fire/EMS, transit, and likely the municipality's public information officer at a minimum.

Each region handles emergency operations and incident management in its own way, in coordination with state and federal stakeholders, depending on the nature and scope of the emergency. Your parking and transportation operation might also factor into those plans, depending on the scenario.

At the heart of NIMS is communication and adaptability. If you haven't already, you will need to assert your voice, provide your expertise, and candidly discuss your available assets and level of readiness with NIMS stakeholders — preferably before any emergency scenario arises.

Parking Facility Roles during Emergencies

While parking facilities can be the focus of specific emergencies, lots and garages can also serve as vital assets and resources for first responders and others:

Staging Area

An open parking lot can be a critical asset for firefighters, police, and/or National Guard units while responding to a large event that requires staging of personnel, materials, and vehicles. Knowing and communicating the availability of and access to parking areas during different times of the day or night can help on-site incident commanders make quick decisions about storing and deploying resources.

Temporary Shelter

A parking garage can serve as an effective temporary shelter in the event of certain forms of inclement weather. A basement garage could prove to be a lifesaver during a tornado or violent wind event. Certain floors of an above-ground garage could provide refuge during a severe thunderstorm, hail storm, or flash flood. Law enforcement officials may decide that a garage is a suitable impromptu holding area to isolate the public from an active shooter situation or other public safety hazard in which quick access to cover could save lives and prevent injury.

Anticipating and planning for the potential use of parking areas as temporary shelter will position your operation to better serve the public and first responders.

EMERGENCY PREPAREDNESS PLAN ELEMENTS

Identifying Applicable Vulnerabilities and Scenarios

One of the first steps in preparing your plan will be identifying the likely — and even not-so-likely — events that could affect your parking operation, either directly or indirectly. What threats do you face? What threats do your institution, your community, your region, and your state face? While your planning will focus primarily on your own operation, that operation exists in a larger context, and it's important to consider how you might figure into someone else's larger plan.

The main task of your plan is answering this question: What must be done, when, and by whom, if this particular event occurs?

Natural Risks

Examples of natural risks include (but are not limited to):

- Earthquake
- Extreme cold weather
- Fire
- Flood
- Lightning
- Mudslide
- Sinkhole
- Snow/ice
- Solar flares/electrical disruption
- Tornado
- Tsunami/storm surge
- Wind

Photo: /dave/null

Man-made Risks

Examples of man-made risks include (but are not limited to):

- Active shooter
- Biological attack
- Bomb threats/explosions
- Broken pipe (water, gas, fuel, oil, etc.)
- Building condemnation/collapse
- Chemical attack
- Combustible gas leak
- Computer virus/DDoS attack
- Crowd stampede
- Employee actions (labor strikes, etc.)
- Environmental failure (frozen pipes, HVAC issues, etc.)
- External accidents (plane crash, train derailment, etc.)
- External actions (civil unrest, terrorism)
- Fire
- Hazardous material spills
- Hijacking
- Internal accidents
- Nuclear material/facility accident
- Nuclear device/bomb attack
- Plane crash
- Sabotage/vandalism
- Security breach evacuation
- Service failure (electrical, phones, Internet)
- Theft/fraud/embezzlement

Other Risks

Other risks that necessitate preparation include:

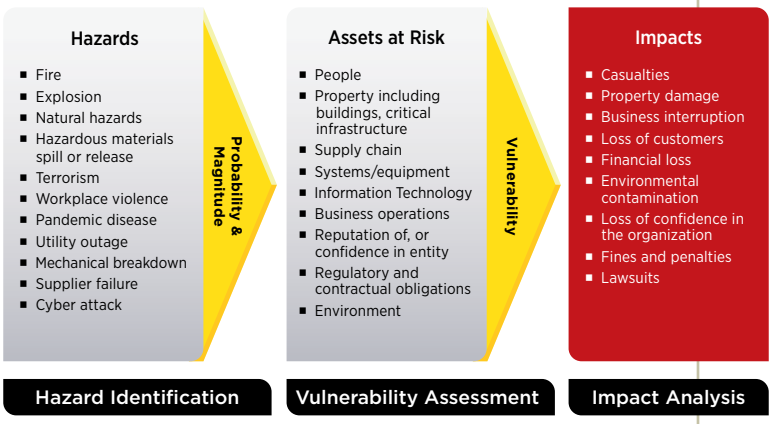
- Cell signal blocking by law enforcement during incident
- Denial of access
- Disease/epidemic/pandemic
- Equipment failure
- Governmental shutdowns/policy changes
- Loss of critical staff
- Loss of lease/agreement/contract
- Other nearby facilities issues
- Power failure
- Power surge
- Transportation disruption

Identifying Critical Operational Functions, Systems and Supplies

An emergency forces us to prioritize. A "must" on an ordinary day can suddenly become optional in an emergency.

You can save your entire operation time and heartburn by identifying the critical functions, systems, and supplies that will likely be affected in an emergency. This is very much a team exercise; no single individual can think of everything, and no single individual can anticipate how every aspect of an operation might be affected.

A useful first step in this process can be creating a spreadsheet of all key elements of your operation. Consider using a budget as an accurate guide. Once that's been created, referencing the applicable vulnerabilities and risk scenarios discussed above, assess the degree (e.g., high, medium, low; or use a quantitative 1–10 scale) to which each element would be affected by each risk. The illustration below offers a model[1].



Once you have identified the degree to which a program element is likely to be affected, you can then focus on how each high-priority threat would ripple through your operation. That way, your emergency preparedness plan can address actions required in an appropriate level of detail.

In the simple example above, the parking and transportation operation would want its plan to thoroughly explain how the shuttle buses would be affected by a snow/ice event and provide specific guidance to staff for appropriate preparation and response. The plan would focus on specifics that might include modified shuttle schedules, fuel supplies, snow tires or chains, cold-weather engine maintenance, reviewing snow/ice vehicle handling with drivers, and other issues.

While identifying critical functions, systems, and supplies that will likely be affected by various types of emergencies, your preparedness plan should include steps to address three essentials: resilience, redundancy, and restoration.

Resilience

Resilience is a key concept in emergency preparedness. As Christopher Neuwirth wrote in "Reducing Uncertainty from Inevitability" at EmergencyMgmt.com, "Resiliency is the ability of a society, or the parts thereof, to absorb the impact of a disaster and readily return to a pre-disaster state. ... Resiliency is, itself, a measure of emergency preparedness. ... It is a ready-state that demonstrates exemplary preparedness and not a coincidental experience. ... If emergency preparedness is not done well, or in isolation of other considerations and factors, resiliency may become minimized, limited, or — worse yet — not experienced at all."

Emergency preparedness means asking what you need to do today to ensure the survival (or restoration) of essential operational elements should an emergency strike tomorrow. Securing vital records, for example, must be addressed in advance of an event; failure to do so could mean their total loss.

Redundancy

Building redundancy — backups — into your operation allows you to continue functioning during an event or return to normal more quickly afterward. Ideally, redundancy has to become as automatic as possible in an operation. It might mean automating data backup, for example.

Part of redundancy might entail stockpiling vital supplies to ensure their availability during an emergency and for a length of time thereafter. Stockpiling will likely require requisitioning an extra quantity of certain supplies or equipment for your operation on a regularly scheduled basis.

Redundancy and stockpiling are simple ideas but not always easy to turn into action. Budget constraints, competing priorities, distractions, and procrastination can all conspire to foil good intentions. They should, therefore, be a standard part of someone's job.

Restoration

Restoring vital equipment and systems as quickly as possible after they've been affected by an emergency requires advance planning and thorough training. In fact, some equipment and systems must be shut down prior to the arrival of an expected event, such as a hurricane or flood, to prevent or limit their damage.

Your emergency preparedness plan should include specific steps and assigned responsibilities to ensure the safe powering down/up of your operation's equipment and systems. These might include computers, electronic parking meters, garage gates and payment systems, vehicles and fueling stations, and others. A complete set of equipment documentation (start-up, operating, and shut-down procedures) should be updated regularly and be easily accessible to all staff trained and cleared for its use.

1 http://www.ready.gov/risk-assessment

Excerpts from the Salt Lake City Department of Airports Basic Emergency Plan

Levels of Emergencies (Non-Airport/ FAA categories)

Following are three categories of emergencies, which are primarily useful for assessment purposes. These correspond with the levels of emergencies as defined in the SLC Corporation Emergency Plan.

Level III

Any emergency that is capable of being handled using local resources, such as a routine medical emergency, traffic accident, etc.

1. Emergency occurs.
2. The Airport Control Center is notified.
3. First responders go to the scene/establish command.
4. Recovery efforts take place.

Level II

Any emergency where one or more of the following criteria are present:

1. The emergency is not routine in nature.
2. Notifications to administration are required.
3. There is extraordinary media coverage.
4. The emergency results in a fatality.
5. There is a situation where 1–9 individuals have sustained moderate injuries.
6. Significant damage to a single structure is sustained.
7. Additional resources from other agencies are requested.
8. If necessary, a PIO is made available for media inquiries.
9. Staging areas are identified by command staff when required.

Level I

Any emergency where any Level II elements are present and:

1. There are mass causalities (10 or more).
2. Resources available on airport are insufficient to effectively handle the situation.
3. Two or more airport structures have sustained significant damage
4. If necessary, the EOC is activated.
5. Additional notifications of airport employees/EOC staff are made by the Control Center.

Sections of the Airport Emergency Plan	
Basic Plan	Provides an overview of general philosophies pertaining to disaster management and contains general guidelines pertinent to all functional sections, and hazard-specific annexes. Unlike the rest of the plan, which contains security sensitive information, this basic plan can be shared with the general public.
Hazard Analysis	The hazard analysis is a document intended to look at the potential emergencies that could occur at or impact the SLC International Airport; to assess, then prioritize each based upon likelihood of occurrence, historical precedence, and other factors.
Functional Sections	A functional section describes a series of general actions that are applicable to multiple disaster situations. For example, an adequate management structure and communications system must exist in every disaster; therefore, functional sections have been created which focus on how both may be established under a variety of circumstances.
Hazard Specific Annexes	Those emergency actions that are applicable to only one or a few types of disasters are placed in hazard-specific annexes.
Checklists	Checklists are summaries of functional sections and hazard-specific annexes, condensed in such a way that they may be immediately useful to field personnel facing emergency situations.
Agreements	This is a listing of memorandums of understanding and letters of agreement between the Department of Airports and organizations willing to provide assistance not found elsewhere in the certification manual.
Glossary	The glossary is a centralized listing of definitions used throughout the Airport Emergency Plan.
Training & Testing	This section provides an indication of the testing/review schedule for various components of the AEP and training methods.
Maps & Resources	This section contains various maps of the airport and surrounding areas, as well as a snapshot list of non-traditional airport resources that will assist the airport in managing an incident/event.

Functional Sections in the AEP

- Alert and Warning
- Direction and Control
- Emergency Communications
- Emergency Personnel, (including Search and Rescue)
- Emergency Public Information
- Health and Medical
- Public Protection (Evacuation and Shelter in Place)

Specific Situations Addressed by the AEP

- Airfield power failure
- Aviation accident
- Bomb threat (terrorism)
- Combustible gas
- Crowd management
- Earthquake
- Flooding
- Hazardous materials (terrorism)
- Hijacking (terrorism)
- Terrorism, (chemical, biological)
- North Support Business (maintenance and fueling facilities)
- Security breach evacuation
- Structure fire

Used by permission. Source: Bruce Barclay, CAPP, Operations Manager, Salt Lake City Department of Airports. Copyright © Salt Lake City Department of Airports

Louisiana State University

As Antonio Casas, director of parking services at the LSU Health Sciences Center in New Orleans, told *The Parking Professional* in March 2013, "Each storm presents its own challenges and is unique."

Casas said the effect depends on how a storm hits the region. Hurricane Isaac in August 2012 was primarily a wind-and-rain event for the campus, he explained, while Hurricane Katrina's biggest effect in 2005 was flooding.

"Katrina pretty much wiped us out," he said. At that time, most of the department's computer servers were on the ground floor, which meant having to almost completely start over after the storm.

"Katrina taught us that when we do a new equipment installation or renovation, we raise the parts and the electrical usually four feet up off the ground and use weatherproof boxes. Our IT department hosts all of our servers now on an elevated floor. Once electrical equipment goes in the water it's shot."

While those steps add resilience to systems, storms have their own way of finding weak points. Lightning and electrical surges during Hurricane Isaac blew out the controls in a couple of the campus's parking areas, and wind-driven rain found its way past weather stripping around doors.

"Card reader parts got water damage and became inoperable even after the power came back," said Casas. "In one of our lots, we had gate operators that had their entire circuit boards fried, either by lightning or when nearby transformers blew."

USDA photo by Dave Kosling

Another lesson learned from Katrina, and applied during Isaac and Gustav, was to have an emergency plan that governs a campus-wide shutdown process. As a storm approaches, the plan details and prioritizes actions to be taken 72 hours out, then 48, then 24. Shutdown begins between 48 and 24 hours in advance, powering down all controls, IT, and parking areas.

"By shutting it all down proactively, we hope to avoid some of the failures and damage from power surges, wind, etc.," said Casas. The buildings have top priority, then parking. Disconnecting equipment from electrical power where possible helps to protect it.

"We were able to recover a lot quicker after Isaac," thanks to all the prep work, he said.

The Parking Professional, March 2013

Identifying Roles and Responsibilities

Even the best-planned, best-organized, and most effectively coordinated responses during an emergency can seem chaotic in the moment. Being crystal clear in advance about roles and responsibilities while preparing (and drilling) your plan helps counteract that sense of chaos.

It's important to integrate your operation into the larger structure of a multi-agency response to an emergency event, and your plan should reflect that.

According to FEMA:

> Emergency management and incident response activities require carefully managed resources (personnel, teams, facilities, equipment and/or supplies) to meet incident needs. Utilization of the standardized resource management concepts, such as typing, inventorying, organizing, and tracking will facilitate the dispatch, deployment, and recovery of resources before, during, and after an incident.
>
> Resource management should be flexible and scalable in order to support any incident and be adaptable to changes. Efficient and effective deployment of resources requires that resource management concepts and principles be used in all phases of emergency management and incident response.

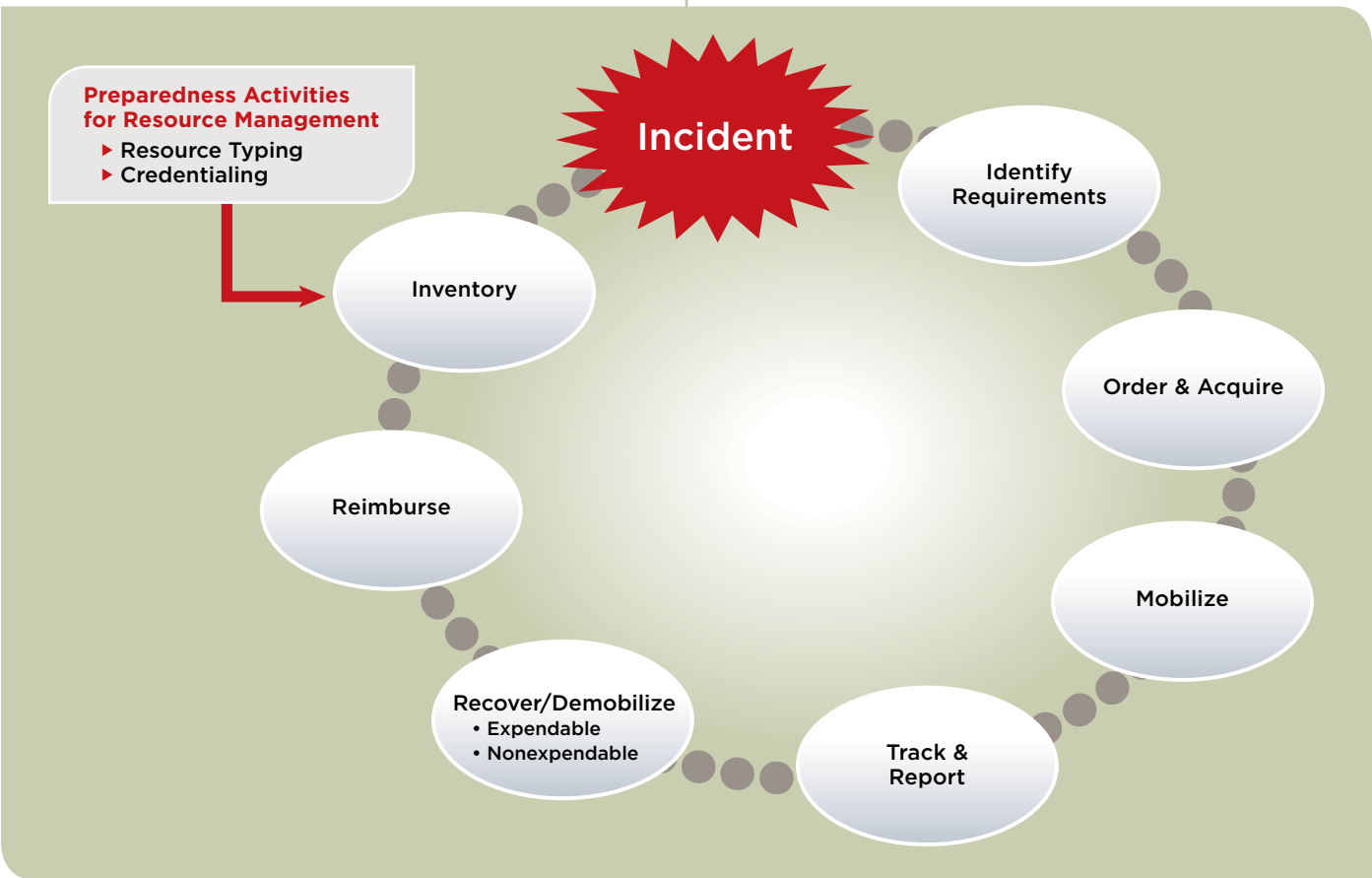
The resource management process can be separated into two parts: resource management as an element of preparedness and resource management during an incident. The preparedness activities (resource typing, credentialing, and inventorying) are conducted on a continual basis to help ensure that resources are ready to be mobilized when called to an incident. Resource management during an incident is a finite process, as shown in the below figure, with a distinct beginning and ending specific to the needs of the particular incident.

(Source: fema.gov/resource-management)

Disaster Response/Management Team

This team will be specific to your community and institution. The composition of this team will vary for each parking sector. IPI suggests using FEMA's Incident Command System (ICS). FEMA explains that it:

- Allows for the integration of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure.
- Enables a coordinated response among various jurisdictions and functional agencies, both public and private.
- Establishes common processes for planning and managing resources.



ICS is flexible and can be used for incidents of any type, scope, and complexity. ICS allows its users to adopt an integrated organizational structure to match the complexities and demands of single or multiple incidents.

ICS is used by all levels of government — federal, state, tribal, and local — as well as by many nongovernmental organizations and the private sector. ICS is also applicable across disciplines. It is typically structured to facilitate activities in five major functional areas: command, operations, planning, logistics, and finance/administration. All of the functional areas may or may not be used based on the incident needs. Intelligence/ investigations is an optional sixth functional area that is activated on a case-by-case basis.

As a system, ICS is extremely useful; not only does it provide an organizational structure for incident management, but it also guides the process for planning, building, and adapting that structure. Using ICS for every incident or planned event helps hone and maintain skills needed for the large-scale incidents.

FEMA explains why ICS is needed:

> When an incident requires response from multiple local emergency management and response agencies, effective cross-jurisdictional coordination using common processes and systems is critical. The Incident Command System (ICS) provides a flexible, yet standardized core mechanism for coordinated and collaborative incident management, whether for incidents where additional resources are required or are provided from different organizations within a single jurisdiction or outside the jurisdiction or for complex incidents with national implications.

In addition:

> The ICS is a widely applicable management system designed to enable effective, efficient incident management by integrating a combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure. ICS is a fundamental form of management established in a standard format, with the purpose of enabling incident managers to identify the key concerns associated with the incident — often under urgent conditions — without sacrificing attention to any component of the command system. It represents organizational "best practices" and, as an element of the Command and Management Component of NIMS, has become the standard for emergency management across the country. Designers of the system recognized early that ICS must be interdisciplinary and organizationally flexible to meet the following management challenges:

Photo: Brussels Airport

- Meet the needs of incidents of any kind or size.
- Allow personnel from a variety of agencies to meld rapidly into a common management structure.
- Provide logistical and administrative support to operational staff.
- Be cost effective by avoiding duplication of efforts.

ICS consists of procedures for controlling personnel, facilities, equipment, and communications. It is a system designed to be used or applied from the time an incident occurs until the requirement for management and operations no longer exists.

Chain of Command

The process of developing your emergency preparedness plan must include discussion of and clarity about the specific positions in your community and at your institution that would participate in various types of incidents and how specific personnel in your parking and transportation operation fit into that command structure.

FEMA says:

> A basic premise of NIMS is that all incidents begin and end locally. NIMS does not take command away from state and local authorities. NIMS simply provides the framework to enhance the ability of responders, including the private sector and NGOs, to work together more effectively. The federal government supports state and local authorities when their resources are overwhelmed or anticipated to be overwhelmed. Federal departments and agencies respect the sovereignty and responsibilities of local, tribal, and state governments while rendering assistance. The intention of the federal government in these situations is not to command the response but, rather, to support the affected local, tribal, and/or state governments.

Lines of Communication

Communication is one of the most challenging elements of any incident response. The 9/11 terrorist attacks, hurricanes Katrina (2005) and Sandy (2012), the loss of the Granite Mountain

Hotshots in an Arizona wildfire, the Washington, D.C., Navy Yard shooter in 2013, and Malaysian Airlines Flight 370 lost in 2014 all demonstrate how problems with communication have compounded catastrophe.

Photo: Penn State

Communication problems can be technological or result from human error. Regardless, prudence dictates anticipating communication difficulties and preparing contingency plans and back-up systems.

As the U.S. Department of Education's Office of Safe and Healthy Students explains in "Developing an Emergency Communication Plan for an Institution of Higher Education," an emergency communication plan serves a number of purposes:

- Prepares the institution to effectively manage emergency communication.
- Identifies possible gaps in warning, notification, response, and resource requests.
- Provides an inventory of all existing communication technologies and a guide for how to activate, use, and deploy these devices.
- Helps staff to respond in an accurate, professional, and timely manner.
- Manages the distribution of critical/sensitive information to the media, students, faculty and staff, and the general public.
- Demonstrates a proactive commitment by the campus to prepare for a crisis before it happens.
- Empowers staff to know what to do, what steps to take, and how to prioritize key functions in crisis.

(Source: rems.ed.gov/docs/FY10EMHE_FGM_ATGA_EmergencyCommPlanIHE.pdf)

Internal

Start with your own operation. Decide whether you need a hierarchical command-tree model of communication, a flat horizontal approach that empowers each team member, or a hybrid of the two. You might decide that if one of your team members spots a vehicle fire in a parking facility, he or she should dial 911 first and then call a supervisor. On the other hand, if one of your team members encounters a television news crew that asks for guidance on where to set up their coverage about a nearby shooting, you might decide the team member should first consult with someone in your operation's management structure or public relations.

An emergency preparedness plan provides a vehicle for you to think in advance about different scenarios and take stock of your current communication systems and policies. If those systems need upgrading or those policies need changing or clarifying, be sure to update your preparedness plan accordingly.

External

An emergency preparedness plan should clarify the "who, what, when, where, and how" of communication with all of your stakeholders. How will you respond to inbound communication? How will you coordinate outbound messaging? Such questions must be thought through carefully, thoroughly, and in coordination with both internal and external stakeholders. In particular, you will want to involve your institution's public information staff in this planning.

"Developing an Emergency Communication Plan for an Institution of Higher Education" outlines the following questions:

- Who are your key audiences?
- What are your key messages at various stages of the emergency?
- How will you communicate the message and the facts?
- How will you activate crisis website, social media, and crisis hotline?
- What type of guidance will you provide to the public?
- How will you control the message?
- How will you control the flow of information?

(Source: rems.ed.gov/docs/FY10EMHE_FGM_ATGA_EmergencyCommPlanIHE.pdf)

The Centers for Disease Control and Prevention (CDC) offers the Crisis and Emergency Risk Communication (CERC) training program, which "draws from lessons learned during public health emergencies and incorporates best practices from the fields of risk and crisis communication. With this comprehensive training program, CDC has moved forward in meeting the needs of partners and stakeholders in preparing for, responding to, and recovering from the threat of bioterrorism, emergent diseases, and other hazards." (Source: bt.cdc.gov/CERC/)

Coordinating/Integrating

Identify and Communicate with Related Entities/Departments

Because no department or organization exists in a vacuum, an emergency preparedness plan should include guidance on working with other entities so relationships and contacts are clear in advance. Parking and transportation will have relationships with any number of related departments, and these will likely be different for campuses versus airports versus other environments.

Review and Reference Emergency Preparedness Plans

In addition to identifying and guiding communication with other departments or entities, the parking and transportation department's emergency preparedness plan should reference and integrate with those other entities' own plans. Ideally, this would involve in-depth discussions and clear agreements with the principals representing those other entities.

Communicate and Ensure Staff Understanding

All parking and transportation staff should be well-versed in the details of the emergency preparedness plan. While not all staff will participate to the same degree in the plan's development, all should have an equal understanding of its details and recognize not only their own roles and responsibilities in an emergency but those of all other team members as well.

Training and Inspection Support from Local First Responders

Local first responders should serve as vital resources and partners for emergency preparedness planning. Be sure to ask them about available training and on-site inspection assistance.

Partnering with first responders not only helps parking and transportation staff get up to speed on how to prepare and react in an emergency but also aids the first responders in better understanding how to interact and work with your department, including possible assets during an emergency.

As IPI Safety & Security Committee Co-Chair Geary Robinson, PhD, CAPP, observed in his doctoral dissertation, "Emergency management agencies should extend their training to include transportation agencies responsible for providing transit assets during disaster events. The goal should be the development of a dialogue to define expectations for the full utilization of transportation systems and their employees during a disaster event."

Robinson also noted that DHS "lists five strategic goals of national concern: awareness, prevention, protection, response, and recovery. Transportation assets and transit operations should be considered in relation to each of these goals."

Annual inspections co-supervised by first responders can help the parking and transportation staff and other relevant departments maintain a higher level of readiness and awareness. Coordinating with first responders in advance on an inspection checklist would be wise and might include:

- Emergency exit access and signage checks and changes.
- Smoke/heat/CO detector and alarm checks.
- Flammable/explosive/noxious chemical and equipment storage (paints, thinners, etc.).

National Guard photo by Laura L. Lopez

Ready.gov provides a handy overview that might inform your training decisions:

WHO NEEDS TRAINING?	WHAT TRAINING SHOULD BE PROVIDED?
All employees	■ Protective actions for life safety (evacuation, shelter, shelter-in-place, lockdown) ■ Safety, security, and loss prevention programs
Emergency Response Team (evacuation, shelter, shelter-in-place)	■ Roles and responsibilities as defined in the plan ■ Training as required to comply with regulations or maintain certifications (if employees administer first aid, CPR, or AED or use fire extinguishers or clean up spills of hazardous chemicals) ■ Additional training for leaders, including incident management
Business Continuity Team	■ Roles and responsibilities as defined in the plan ■ Additional training for leaders, including incident management
Crisis Communications Team	■ Roles and responsibilities as defined in the plan ■ Additional training for leaders, including incident management ■ Training for spokespersons

(Source: ready.gov/business/implementation/training)

FEMA offers a free independent study program for all staff, featuring NIMS-compliant courses at http://training.fema.gov/IS/NIMS.aspx. These classes include:

- ICS 100: Introduction to ICS.
- ICS 200: Basic ICS.
- ICS 700.A: National Incident Management System (NIMS) — An Introduction.
- ICS 800.B: National Response Framework — An Introduction.

Locally offered classes can supplement FEMA's offerings.

Evacuation vs. Refuge in an Emergency

Decision Making

Because the parking and transportation function is a key asset in an institution's (or community's) ability to prepare and respond — particularly in facilitating mobility or refuge — parking and transportation management must participate in decision-making during planning and preparation and certain types of emergencies.

Coordination between Parking and Transportation

In the event that your institution or community splits parking and transportation into separate departments, coordinating in advance becomes all the more important.

Photo: Steve Schaaf

MONTHLY PLANNER TOOL

Purpose

An emergency preparedness plan needs to be a living, often-used document to remain relevant and current for your parking/transportation operation. This monthly planner tool is one example of how you can integrate emergency preparedness planning into your staff meetings on a regular basis.

IPI Annual Emergency Preparedness Planner

Depending on the type of parking venue you operate (airport, hospital/medical center, university, stadium, municipal, or commercial), what kinds of issues or threats can you anticipate — and integrate into your emergency preparedness planning — throughout the year?

Nature (1)	Events (2)	Org'l Changes (3)	HR/Budget Changes (4)	Tech Changes (5)	Infrastructure Changes (6)
Jan					
Feb					
Mar					
Apr					
May					
Jun					
Jul					
Aug					
Sep					
Oct					
Nov					
Dec					

Category Examples:

(1) Seasonal, earthquakes, hurricanes, thunderstorms, hail, lightning, severe winds, flooding, snow/ice, fires, etc.
(2) Large gatherings, fairs, games, races, other crowd generators
(3) New management, new policies, new reporting structures, new departments, eliminated departments, etc.
(4) Planned furloughs, fleet vehicle reductions/maintenance
(5) New computers/software, mobile devices, parking meters, security systems, fire alarm/sprinkler systems, etc.
(6) Planned work on nearby roads/bridges, electrical, water, etc. affecting access/egress from facilit

Anticipate, Update, and Drill

Your planning and the resulting documentation should help you and your team think ahead. What seasonal threats might you face (e.g., weather)? What about event-related threats (e.g., large crowds during football games or parades)?

Ideally, you and your team will have a master calendar to use for anticipating both what's planned and what's possible far in advance. Then you can update that forward view on a regular basis and schedule drills and exercises, both internally and in cooperation with outside partners, to run through likely scenarios and identify changes that need to be made to keep your preparedness level sharp.

Photo: Brussels Airport

EXERCISES

Sourced verbatim from Ready.gov.

Post-incident critiques often confirm that experience gained during exercises was the best way to prepare teams to respond effectively to an emergency. Exercises should be designed to engage team members and get them working together to manage the response to a hypothetical incident. Exercises enhance knowledge of plans, allow members to improve their own performance, and identify opportunities to improve capabilities to respond to real events.

Exercises are a great method to:

- Evaluate the preparedness program.
- Identify planning and procedural deficiencies.
- Test or validate recently changed procedures or plans.
- Clarify roles and responsibilities.
- Obtain participant feedback and recommendations for program improvement.
- Measure improvement compared to performance objectives.
- Improve coordination between internal and external teams, organizations, and entities.
- Validate training and education.
- Increase awareness and understanding of hazards and the potential impacts of hazards.
- Assess the capabilities of existing resources and identify needed resources.

Types of Exercises

There are different types of exercises that can be used to evaluate program plans, procedures, and capabilities.

- Walkthroughs, workshops, or orientation seminars.
- Tabletop exercises.
- Functional exercises.
- Full-scale exercises.

Walkthroughs, workshops, and orientation seminars are basic training for team members. They are designed to familiarize team members with emergency response, business continuity, and crisis communications plans and their roles and responsibilities as defined in the plans.

Tabletop exercises are discussion-based sessions where team members meet in an informal classroom setting to discuss their roles during an emergency and their responses to a particular emergency situation. A facilitator guides participants through a discussion of one or more scenarios. The duration of a tabletop exercise depends on the audience, the topic being exercised and the exercise objectives. Many tabletop exercises can be conducted in a few hours, so they are cost-effective tools to validate plans and capabilities.

Functional exercises allow personnel to validate plans and readiness by performing their duties in a simulated operational environment. Activities for a functional exercise are scenario-driven, such as the failure of a critical business function or a specific hazard scenario. Functional exercises are designed to exercise specific team members, procedures, and resources (e.g., communications, warning, notifications, and equipment set-up).

A full-scale exercise is as close to the real thing as possible. It is a lengthy exercise that takes place on location using, as much as possible, the equipment and personnel that would be called upon in a real event. Full-scale exercises are conducted by public agencies. They often include participation from local businesses.

Cities Readiness Initiative

Local and state agencies conduct joint Cities Readiness Initiative Full-Scale Exercises around the U.S. to assess the ability of personnel from different departments and agencies to collaborate in mass-dispensing of medications operations, implement a traffic control and security plan, and assess the ability of mass dispensing staff to receive on-site training.

The Centers for Disease Control and Prevention (CDC) Cities Readiness Initiative (CRI — http://www.bt.cdc.gov/cri/) is a federally funded program designed to enhance preparedness in the nation's largest cities and metropolitan statistical areas, where more than 50 percent of the U.S. population resides. Through CRI, state and large metropolitan public health departments have developed plans to respond to a large-scale bioterrorist event by dispensing antibiotics to the entire population of an identified Metropolitan and Micropolitan Statistical Areas MSA[2] within 48 hours.

Developing an Exercise Program

Develop an exercise program beginning with an assessment of needs and current capabilities. Review the risk assessment and program performance objectives. Conduct a walkthrough or orientation session to familiarize team members with the preparedness plans. Review roles and responsibilities and ensure everyone is familiar with incident management. Identify probable scenarios for emergencies and business disruption. Use these scenarios as the basis for tabletop exercises. As the program

2 This data is used to count the number of people living in a geographical area and or other data about a specific population. From the U.S. Census Bureau "A metro area contains a core urban area of 50,000 or more population, and a micro area contains an urban core of at least 10,000 (but less than 50,000) population". https://www.census.gov/population/metro/

matures, consider holding a functional exercise. Contact local emergency management officials to determine if there is an opportunity to participate in a full-scale exercise within your community.

Evaluating Exercises

Exercises should be evaluated to determine whether exercise objectives were met and to identify opportunities for program improvement. A facilitated "hot wash" discussion held at the end of an exercise is a great way to solicit feedback and identify suggestions for improvement (e.g., discuss what went right, what went wrong, what assets were sufficient, what were deficient, what can be done better, and other points) and allows the organization to update the plan more effectively.

Evaluation forms are another way for participants to provide comments and suggestions. An after-action report that documents suggestions for improvement should be compiled following the exercise, and copies should be distributed to management and others. Suggestions for improvement should be addressed through the organization's corrective action program.

Photo: Jacinta Quesada

Texas A&M Buses Helped Relocate Hurricane Victims

Following Hurricane Katrina in 2005, Transportation Services at Texas A&M University used 10 of its buses to carry arriving Hurricane Katrina evacuees from Kelly Air Force Base to shelters in San Antonio. The effort included a team of 23 student drivers, four managers, and four university police department representatives.

According to the *Aggie Hotline*, Rod Weis, who was director of transportation services, said his department quickly took action after receiving word that the Federal Emergency Management Agency (FEMA) needed assistance with the evacuation of 25,000 people from New Orleans to San Antonio. After receiving approval from the Texas governor's office, the buses departed to meet the first four plane loads of evacuees.

Source: Peter W. Lange, VP, Administration, Executive Director for Transportation Services; based on article in *Aggie Hotline*, Sept. 2, 2005. Full article: http://transport.tamu.edu/About/news/2005/05_9_2AggieKatrina.aspx

"Transportation, especially at an airport, can have a huge effect on an emergency situation. Our shuttle fleet is on standby for many in-flight emergencies. In any circumstances where there is a possibility of passenger evacuation, shuttle operations are placed on standby or into action. Examples of such circumstance include landing gear issues, smell of smoke in the cockpit or galley, flat tires, and even bird strikes."

Bruce Barclay, CAPP, Operations Manager, Salt Lake City Department of Airports

"The U.S. Federal Emergency Management Agency and Public Safety Canada have worked diligently since 2001 to develop standardized emergency management systems for both countries, with well-defined roles for emergency planners and responders. One of the outgrowths of this effort is a growing recognition of the critical role of support functions in emergency preparedness and response.

One of the most important support functions needed in an emergency is transportation. Without transportation, first responders can't respond, supplies can't be delivered, victims can't be evacuated, people can't be moved, and business can't operate. That simple fact makes fleet management a critical support function in an organization's emergency operations plan. As fleet managers, we all share a responsibility to help guide our organizations successfully through emergencies."

Bryan Flansburg, CAFM, *Director, Transportation Services, University of Colorado at Boulder*

RESOURCES & REFERENCES

Federal

- National Preparedness Goal
  - Online overview: http://www.fema.gov/national-preparedness-goal
  - Manual (PDF): http://www.fema.gov/media-library-data/20130726-1828-25045-9470/national_preparedness_goal_2011.pdf
- NIMS (http://www.fema.gov/national-preparedness/national-incident-management-system)
- FloodSmart (http://www.floodsmart.gov/)
- NFIP (http://www.fema.gov/national-flood-insurance-program-2/garages)
- http://www.fema.gov/library/viewRecord.do?id=1719
- http://www.fema.gov/protecting-your-businesses
- http://www.ready.gov/business-continuity-planning-suite
- http://www.ready.gov/campus
- http://www.dhs.gov/topic/plan-and-prepare-disasters
- http://www.dhs.gov/national-infrastructure-protection-plan
- http://www.dhs.gov/transportation-systems-sector
- http://www.fema.gov/national-response-framework-0
- http://www.phe.gov/preparedness/Pages/default.aspx
- http://www.dhs.gov/how-do-i/prepare-my-business-emergency
- http://emergency.cdc.gov/planning/

Private

- http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=1600
- http://www.scnus.org/page.aspx?id=104616
- http://www.disasters.org/deralink.html
- http://www.wbdg.org/design/park_surface.php
- http://www.wbdg.org/design/secure_safe.php
- http://www.wbdg.org/design/park_basement.php
- http://www.wbdg.org/design/park_outside.php
- http://www.redcross.org/prepare/location/workplace

APPENDIX and SAMPLE PLAN EXCERPTS

- National Preparedness Goal (PDF) (Source: http://www.fema.gov/media-library-data/20130726-1828-25045-9470/national_preparedness_goal_2011.pdf)
- Federal Aviation Administration Sample Airport Emergency Plan (pages 1–40)
- Clemson University Draft Emergency Operations Plan Table of Contents (Source: Doctoral dissertation © of Geary L. Robinson, PhD)
- The University of Texas at Austin Severe & Inclement Weather Response Annex 2013 (draft) (Source: Gerald R. Harkins, Associate Vice President, Campus Safety and Security, the University of Texas at Austin)
- Ready Business ERP Form

Photo: Brussels Airport

Photo: Seaman Barry Riley

International Parking Institute

1330 Braddock Place, Suite 350

Alexandria, VA 22314

parking.org

Appendix 36

Parking Program Strategic Communications Plan and Marketing Strategy Implementation Plan

Strategic Communications Plan Development

Regardless of whether an organization is budgeting for dollars, staff time, and/or scarce resources, strategic investment in marketing and communications often slides to the bottom of the list. However, in reality, thinking strategically about communications, public education, and media relations decisions can support every other aspect of a parking and transportation system's operations.

This section highlights opportunities to proactively engage key user groups in policy and programmatic decisions that will impact their experience accessing downtown Norman.

The strategies have been divided into three categories:

- Program Brand Development, Messaging, and Key Audiences: Ways to build connection, pride, and ownership among staff and users.
- Media Tools and Platforms: Strategies to build the organization's narrative via consistent and creative communication, utilizing the most effective tools.
- Implementation Framework: How to organize the various elements of your plan for practical implementation and progress tracking.

Program Brand Development, Messaging and Key Audiences

Intentional promotion and positioning of the County/City's parking and access options will provide opportunities for increased user recognition and engagement, as well as increased understanding about existing and future service areas.

Organizational Brand

An organizational brand goes beyond an organization's name, logo and visual identity. A brand represents an unspoken promise, or commitment – of quality, value, professionalism and financial stewardship – about the consistent experience patrons can expect when interacting with the County/City's parking system. Over time, a brand becomes synonymous with an organization and its programs/facilities. When patrons see an organization's signage, communication pieces or uniforms, an emotional connection is created that evokes the memories and feelings

Key Definitions

Brand Position: A brand position is a simple statement that conveys the essence of an organization and provides a promise to both customers and partners about the type of environment that can be expected. It also sets the tone for the development of the actual brand, which will only resonate with patrons and investors if it reflects the true character of the organization it represents.

Messaging: A messaging strategy is the foundation for all of an organization's marketing efforts. Put simply, a messaging strategy tells the audience that you are trying to convey why they should visit your organization, what they will find when they do, and why they should care. For a brand to resonate with its customers and partners, the messaging strategy needs to inspire confidence that the organization understands its patron and partner needs, and has something relevant and unique to offer.

Vision: This statement should be very aspirational and speak to the organization's ultimate point of success.

Mission: This statement defines what an organization is, why it exists, and its reason for being.

that a person associates with a particular organization.

Branding creates value and starts with truth. It identifies shared values and areas of expertise; for example, what community needs are and are not being met by the organization? What story is your current brand telling about the organization? What story do you want to tell? Your organizational brand provides the foundation for the creation of content and tone for marketing efforts, customer relations efforts, and organizational culture.

The new public parking system in downtown Norman will need a brand identity that is clear, consistent, and that starts the interaction with a parking patron – whether online or on the street – in a positive manner.

In addition to creating a program logo, it is strongly recommended that the County/City develop the following foundational brand elements as part of the development of their new parking system: 1) an organizational brand position statement, 2) a Vision Statement, and 3) a Mission Statement that support the guiding principles outlined in the larger Parking Strategic Plan.

The Mission/Vision and Guiding Principles poster to the left is an example from the Anchorage Community Development Authority's EasyPark program.

Messaging

Messaging provides a foundation for the creation of content and tone for marketing, advertising, and outreach. Messaging for Norman's parking system should focus heavily on how the department will work to align parking policies and programs with the community's strategic development and growth goals.

The three key elements to effective brand messaging include:

- **Consistency:** Keeping similar tone/feeling when communicating to your patrons.
- **Frequency:** The driving force – keeping the message in front of the audience as often as possible – and not just focusing on providing "must have" information about construction, special events, and programs but updates that reinforce the goals of the organization and remind users of the bigger picture.
- **Anchoring:** Messaging that provides a compelling call to action. Memorable, high impact language and visual presentation that talks to the patron, not at the patron.

When talking with stakeholders over the course of three months, several key topics were mentioned that will be useful for County and City staff and leadership as they work to create the messaging that will support this next chapter of coordinated access management for the downtown Norman.

Parking and transportation in downtown Norman:

- Are "quality of life" issues
- Should be developed in a way that is "fair" and "equitable"

- Must be easy to find and well-signed
- Should "enhance the downtown experience" and be "flexible"

Target Audiences

A successful communication and outreach plan starts with identification of the primary and secondary audiences. While every unique communication effort doesn't have to be tailored to meet a specific audiences' needs, it is important to keep in mind that communication – especially during intense or challenging times – isn't always a "one size fits all" solution. Audience identification can help the City and County know when additional communication or explanation of a situation might be needed. It also helps prevent overwhelming customers with irrelevant or too much communication, and can assist with making choices about which communication tools will be most effective for a particular audience (i.e., using heavily-trafficked online resources.

The following parking user groups have been identified as primary audiences for the parking system:

Frequent Patrons: This audience includes daily commuters and regular patrons of businesses, organizations, and entities that interact with the public parking system at least once per week. These customers are more informed about parking policies and regulation than the average parker, however they may be more resistant to future changes because they have an established routine. This audience likely has an established connection with another downtown stakeholder group (like Norman Downtowners Association) so they are more likely to be plugged into an existing communication network that can be leveraged by the new County/City's parking program.

Visitors, New and Future Patrons: This audience includes moderate to infrequent users and potential future users. This audience also includes suburban residents who travel to the city center for special events or meetings. This is a more challenging group to reach because of their infrequent use of the system; however, they are also likely to complain the loudest when they have a negative parking experience.

Central Business District Stakeholders (Norman Downtowners Association, Campus Corner business and property owners, merchants, downtown residents, etc.): This audience segment is highly engaged which can provide both a challenge and opportunity. On one hand, they are very knowledgeable and are connected to larger groups of stakeholders or customers. On the other hand, while these groups often lack knowledge about professional parking management policies and can become quickly frustrated at the slow pace of the public sector. The County/City has an active, engaged and professional partner in the Norman Downtowners Association. Leveraging this relationship will be key as the County and City work to get the word out about how parking will be managed in the future.

OU: OU is one of the most important audiences to consider and consult with on parking and transportation issues, especially in the area of Campus Corner. As was reflected in stakeholder meeting comments, neighborhoods adjacent to the OU campus are constantly impacted by students parking and accessing campus using neighborhood streets and curb space. It is vitally important the City stay in close communication with OU staff and neighborhood leadership to

address new issues that might arise from student parkers spilling out of campus to enrollments grow and the campus implements their own parking management strategies.

Secondary audiences include:

- City of Norman neighborhood associations
- Downtown business or property owners who are actively managing parking
- County residents and businesses
- Media/Press

Here is a helpful way to think about how each of these pieces – organizational mission, vision, messaging, and audiences – all fit together to create one cohesive brand position:

BRAND POSITION:

- To (Target Audiences):
- We are (Unique Identifier):
- That (provides "X" to the audience):
- By (details that support "X"):

VISION:

- How would you define your ultimate point of success?
- What umbrella task/goal do you possess that will be worked on indefinitely?

MISSION:

- What will you do to continuously work towards your vision?
- What markets are you serving and what benefit do you offer them by working towards your vision?

Questions to identify key words in a statement that presents the means in which your organization will work towards the vision:

- What perceptions, habits, or beliefs do we need to work on or develop in order to grow?
- What are we "selling"?
- Who do we benefit?
- What's in our Tool Kit (i.e., what resources do we provide)?

MEDIA TOOLS AND PLATFORMS

It is important to identify and utilize a variety of mediums when communicating with current and future parking customers. From updating the community on current construction projects, policy changes, to providing basic educational information or rolling out system enhancements, the key is to communicate early, often, and in ways in which your messages will be heard.

When identifying the media tools and platforms that will work best for the parking system, the following items should be considered:

Web Presence

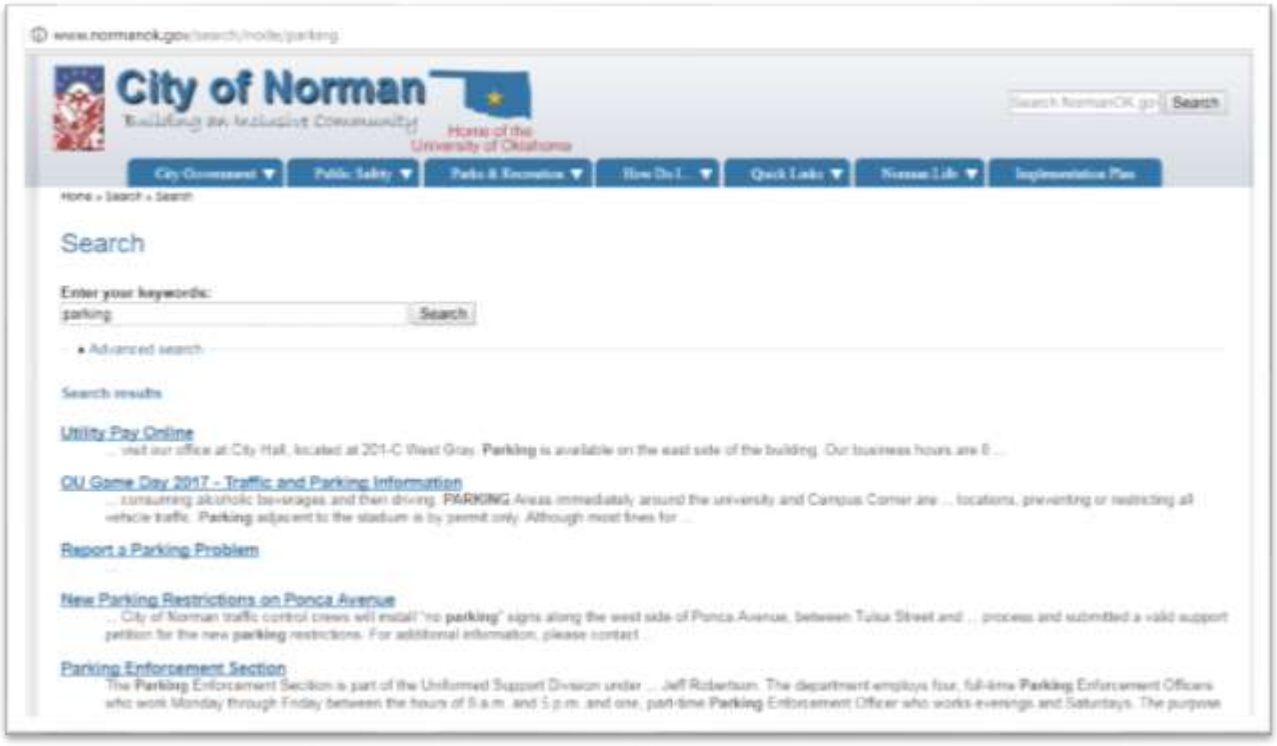
The parking department's webpage should be a one-stop shop for all critical information about parking services and policies in downtown Norman.

When one visits the City of Norman's website today, there is no information to be found about parking unless one selects the "search" function. After performing a search for "parking", the first item that comes up is how to pay a utility bill online. As shown in Figure 4, general information about the Parking Enforcement Section is the 5th displayed result.

"MUST HAVE" ONLINE RESOURCES

- Basic parking information/location/directions
- Mission, vision, and values of the organization and the work underway to achieve those goals
- Detailed information about service and programmatic offerings
- Comprehensive calendar of events and opportunities for target market audience engagement with the organization
- Links to social media
- Special event information including event-related street closures, special event parking rates, and links to legitimate private event parking operators
- A contact form
- Emergency phone number/contact information that is answered 24/7
- Section with professional pictures of staff, leadership, and front line parking staff
- The ability to pay citations, purchase permits, and cancel permits
- Important news including construction-related street/lane closures, temporarily reserved parking areas, special event parking information, meters that are hooded or out of service, etc.
- Links to relevant transit information, including UTA bus routes, FrontRunner information, BRT updates, etc.
- Information for cyclists

Figure 1. City of Norman Search for "Parking"



When one performs a Google search for "parking in Norman", the first link on the search results is a link for how to pay a parking ticket. Nowhere on the City or County websites or in the Google search results could a map of available parking locations or rates be located, and information regarding public transportation is difficult to find for visitors.

As the web is often one of the very first places that visitors will go to find parking, it is critically important the City of Norman has a link to information about parking and transportation options at a very high level on its main website, preferably on the home page under the "Departments" drop down box. As the City looks to elevate the level of customer care provided online, the following enhancements should be considered:

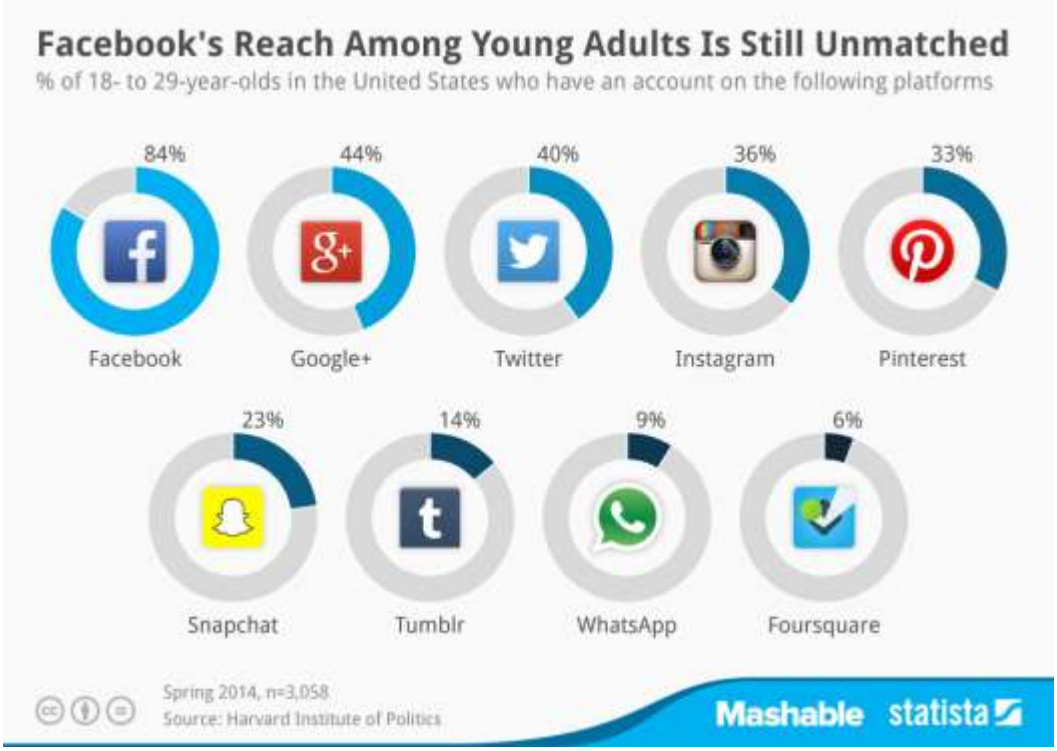
- The web page must be well-managed with a plan to keep content fresh and new. Users returning to the site and finding nothing new are likely to stop utilizing it as a resource. Important news should be more prominently listed on the home page.
- The web page should have a balanced mixture of written content and visual imagery. Cleveland County's site follows this balance well and the format used for the rest of the City's website should be carried over into future parking web page(s).
- The site should be reviewed to ensure accessibility for those with visual impairments.
- Look into using Google Analytics (or a similar tool) to track where the website is receiving the most traffic and actively move those items to the home page (this will be discussed later in the Metrics section).

Social/New Media Tools

Social media has changed the way people communicate, how stories are told, and how information gets distributed. However, as many industries are noticing, social/new media strategies are only as effective as the consistency of the staff, intern, or volunteer time that is spent to maintain them. The effective use of social media means making a commitment to keeping it updated and fresh with content. The most successful parking programs and organizations using social media are creative in their messaging and approach, using the site not just for information, but for contests and fun interactions as well. Social media gives the brand a personable and down to earth accessibility that gives a user a continuous reason to keep coming back.

The City of Norman already uses a variety of social media sites to connect with residents and visitors including Facebook, Twitter, and Pinterest. As the City of Norman considers the many community education and communication tools that will be part of the new parking department's "Tool Kit", social media should be a strong contender.

Figure 2. Social Media Site Market Percentage



Cleveland County and the City of Norman has a youthful population filled with students, young families, and tech-savvy professionals. According to a 2014 study of Americans aged 18-24, "more than half of Millennials said they would consider moving to another city if it had more and better options for getting around, while 66% said that access to high quality transportation was one of the top three criteria they [weighed] when deciding where to live". These audiences are likely already on social media and will come to expect that they'll be able to follow, tweet, post or tag a picture as part of their basic customer service interaction with the new parking enterprise.

All the social/new media tools should ultimately tie back and feed live updates to the parking department's web page.

Additional Communication Tools and Tactics

In addition to a fresh and interactive web presence and active engagement with social/new media strategies, the following communication tools can be very useful for sharing information and engaging diverse user groups:

- **Utility Bill Survey:** The utility bill is a powerful tool because it is likely to reach a far larger audience than can be reached by other, often online-only, tools. Utility Bill inserts can provide link information and QR codes, and can list other ways that residents can provide feedback (i.e., upcoming meeting dates, phone number or email information).
- **Opt-in Text Message System:** For those community members who are faced with "email overload" or who choose not to have a smart phone, offering an opt-in text messaging system is a good option. A text message number would be provided to community members interested in receiving text messages about upcoming meetings, construction updates or programs that might impact their neighborhood. This system can be relatively inexpensive and easy to manage. Normal text messaging rates for those who opt-in do still apply.
- **Educational Materials:** As downtown Norman's parking system matures, it will be important to consider the diversity of audiences in downtown Norman and offer a variety of informational pieces, both online and in more traditional formats like informational "one pagers". These documents should live online where they can be downloaded and printed at home, as well as distributed at meetings and at the future parking office. Some examples of basic informational pieces to consider developing include:
- **Parking Department Overview:** Include basic information like Mission, Vision, Values/Guiding Principles, contact information, website and basic enterprise information like facility locations, pricing and how revenues are spent.
- **Annual Report:** An Annual Report provides programs with an opportunity to document and share progress made over the course of a year. Some basic items to include in the report: annual achievements, budget information, marketing and outreach efforts, priorities for the coming year and statistics on customers served. The Annual Report can also include results from benchmarking and customer service surveys. A popular trend in Annual Reports is the creation of online only reports that are designed as infographics instead of the traditional text report. This can cut down on cost, provide additional transparency, and be more digestible for stakeholders.
- **Commuter Information:** As Norman works to promote the use of other modes, it will be important to track the percentage of customers using various modes. This information can be folded into an Annual Report or presented as a stand-alone enterprise marketing piece.

Educational Videos: Videos can be a powerful instructional and informational tool, especially when trying to convey often technical information about new parking technology. Videos are also a great way to include customers or other popular community leaders like Mayor Miller in the development of educational materials, videos and other media campaign (i.e., customers/community leaders can be used to demonstrate technology in educational videos,

replace stock photos on your Web site and can be trained as citizen peer advocates for a particular stakeholder group).

"Industry Captains": One of the most powerful tools that can be leveraged is the sharing of information and advocacy of an idea by peer groups. The new Parking Program Director should make one of his/her first tasks to reach out to key thought leaders in the business, residential and community development sectors and work on getting their buy-in to act as citizen ambassadors for the new enterprise. These "Industry Captains" can then help broaden the reach of key messages and often their voices can carry more weight and gain more trust with peer groups than messages coming straight from the City, County, or other public source.

Explore free smart phone applications that can help provide information without a significant capital investment. Applications like "ParkMe" are free to consumers and use algorithms, rather than expensive real time data, to help customers find a space using their mobile device.

Continue frequent user focus groups and targeted stakeholder engagement. The public consultation work that was done as part of the broader Parking Strategic Plan has laid the foundation for frequent future communication with community stakeholders. It is strongly recommended that this trend continue and in the future, have interactive stakeholder consultation opportunities to keep the community informed, educated, and part of the decision-making process for future program, policy, and technology decisions.

Patron engagement campaigns:

- **PARK(ing) Day:** PARK(ing) Day is an annual worldwide event held each fall where artists, designers, and citizens transform on-street parking spots into temporary public parks (www.parkingday.com). This would be a great campaign do in partnership with the Norman Downtowners Association.

- **Bike to Work Day:** Partnering with a very active bicycle and pedestrian advocacy group in this effort could be a positive way to encourage increased use of alternative modes of transportation in the City. An awareness event could be held on Bike to Work Day in partnership with local bicycle advocacy groups.

- **Include customers** in the development of educational materials, videos, and other media campaigns (i.e., customers can be used to demonstrate technology in educational videos, replace stock photos on your website, and can be trained as citizen peer advocates for a particular stakeholder group).

Public Relations

The importance of a well thought out public relations plan cannot be overstated because in the absence of information, the general public will make up their own answers and/or rumors will be given more "legs" than when an organization is proactively pushing out their desired message.

Communicating about parking requires both technical savvy and an understanding of the often-intense emotions that are experienced when dealing with parking concerns and issues. Relationship and trust building can be slow, however there are a few strategic first steps that can be taken to begin developing productive relationships with the general public and the media:

- **Form strong, reciprocal relationships with local media:** This is especially important during times of crisis and should include local and regional media outlets. The consulting team observed a strong interest from local and regional media in covering the Strategic Parking Management project and City and County staff indicated a productive ongoing relationship with several local media outlets. It is strongly recommended that the County/City continue to build and strengthen these relationships in order to leverage the broad reach of those media outlets.
- **Be out in front of stories:** The new downtown Norman parking management team and City and County Communications staff should be in frequent touch to discuss potential public relations issues and to make a joint and informed decision about what communication is needed and the best angle to take.
- **Develop a Crisis Communication Plan:** It is absolutely critical to have a written Crisis Communication Plan in place and to know the chain of command protocols for addressing the issue publicly before control of messaging is lost. Please note that any plan should be vetted by and complement the City's and County's overall Crisis Management Plans. (See Appendix 35 for a Sample Crisis Communication Plan outline).
- **Feed information to media:** This may run counter to the operating norm for many parking systems who try to fly under the media's radar, but it is particularly effective when a crisis hits and you want to be one of the first calls the media makes.
- **Ramp up communication during times of transition:** People and organizations often stop communicating during times of transition (i.e., construction, program building, and introduction of new technologies) because they feel that they "aren't there yet" and need to have everything completed before bringing their constituencies along. This is exactly the opposite of what should be done; parking and transportation changes and/or "inconveniences" can lead to intense frustration and fuel complaint volumes. During times of transition, communication should be:

    1. Clear and understandable
    2. Tailored to your key audiences
    3. Repetitive and simple

Planning Context

This framework was designed to provide strategies that can be implemented immediately, as well as those that will take longer to develop and cultivate. Some recommendations can be done with little to no resources while others will require more significant investment.

This section includes both a high-level overview of the strategies that are recommended as immediate focus areas for the City and County, as well as a detailed implementation matrix that has been developed to guide staff through implementation of the elements outlined in the preceding sections.

Key areas to consider during plan implementation and in combination with the tools and tactics outlined in the previous section include the following:

Staffing and Staff Development

The organization should have a qualified individual or individuals who are properly trained to provide the marketing, communication, and stakeholder outreach expertise needed to meet the organization's strategic goals and effectively serve its patrons.

Recommendations:

Job description(s) or part of existing job description with specific marketing and communication duties are established and documented. They are an integral part of initial training, evaluations, and promotion opportunities.

Position specific training is well organized, effective, and ongoing. The extent and depth of training is tailored to the skill level of the employee and should be well documented.

Employee performance measures specific to marketing and communication are established as part of the employee onboarding process. Performance evaluations should occur regularly and be well documented.

- Formal evaluations are performed at least once a year.
- The evaluation process is supported by an appropriate written evaluation instrument that includes both scored criteria and relevant comments from the evaluator.
- Evaluation criteria are specific to the marketing and communications functions and responsibilities of the employee being evaluated.
- Evaluation documentation is produced and the evaluation interview conducted by the supervisor who is in the best position to evaluate that employee's performance.

Suggested Documentation:

- Job description with specific marketing, communications, and public relations duties
- Marketing and communications training program outline, materials, and records
- Ongoing development program for marketing and communications staff member
- Schedule and materials
- History of participation and completion
- Marketing and communications specific evaluation forms, criteria, and evidence of evaluation completion (minimum annually)

Annual Communications, Marketing and Stakeholder Engagement Planning

The organization should create an annual communications, marketing, and stakeholder engagement plan and a dedicated budget that supports the overall organization's strategic goals. The plan should be reviewed regularly and includes reporting and evaluation metrics.

Recommendations:

The plan is established and refined in the 3rd and 4th quarters of the preceding fiscal year and is aligned with the organization's overall strategic goals. Plan is assessed bi-annually by the marketing and communications staff member(s) and the appropriate supervisor.

Create a dedicated communications, marketing, and stakeholder engagement budget.

- The budget priorities are established and refined in the 3rd and 4th quarters of the preceding fiscal year and are aligned with the organization's overall strategic goals. Budget is assessed quarterly by the marketing and communications staff member(s) and the appropriate supervisor.

Metrics are identified to evaluate the effectiveness of marketing and stakeholder engagement tactics, campaigns, and strategies. (See the "Metrics to Measure Success" section for ideas)

- Metrics are assessed annually. These evaluation processes are supported by appropriate written documentation.
- Evaluation methods should include, but are not limited to, the following: outreach to internal and external audiences, through targeted surveys and/or focus groups, vendors, sponsors, partnering organizations, web and social media analytics.

Suggested Documentation:

- Strategic Communications, Marketing and Stakeholder Engagement Plan
- Process description and notes/minutes from meeting where proposed marketing and community outreach plan is reviewed and approved (at least annually)
- Notes/minutes from meetings where marketing and community outreach budget is reviewed and discussed (at least bi-annually)
- Process description and notes/minutes from meeting where evaluation metrics are reviewed and approved (at least annually)
- Written documentation of evaluation metrics, processes and data

Media Relations Planning

The organization should have an established media relations strategy that includes local, regional, and national media connections. Strategies should be built on a foundation of trust, reciprocity, and transparency.

Recommendations:

Develop a media relations strategy.

- Includes a comprehensive list of local, regional, and national media contacts that is reviewed for accuracy at least quarterly.
- Strategy includes specific sub-sections outlining approved policies and procedures for addressing re-occurring annual, seasonal, campaign and event specific communications functions (i.e., special events, service disruption, construction).

- Strategy is aligned with the organization's overall strategic goals and assessed every other year by the marketing and communications staff member(s) and the appropriate supervisor.
- The organization has a designated individual or individuals who are properly trained to communicate with the media.
- The organization has one or more designated spokespeople who have specific experience and/or have received training on how to communicate effectively with the media.

Suggested Documentation:

- Up to date media list.
- Names and titles of designated media spokespeople.
- Documentation of media/public relations training program for all designated spokespeople.
- Records of past media relations campaigns and/or notification materials and documentation (i.e., press releases, collateral material, talking points etc.).

Please note: Recommendations related to staffing and annual planning for marketing, communications, and ongoing community outreach efforts should align with and complement future strategic decisions made about organizational structure and staffing as part of the recommendations outlined in the Parking Strategic Plan.

Implementation Matrix

The following implementation matrix aims to provide guidance on short-, mid- and long-term implementation recommendations for communications, marketing and stakeholder engagement efforts.

Strategies correspond with categories listed in the previous sections and are coded for ease of reference as follows:

- Web Presence (Web)
- Social/New Media Tools (Social)
- Additional Tools and Tactics (Tools)
- Public Relations (PR)
- Staffing and Staff Development (Staff)
- Annual Communications, Marketing and Stakeholder Engagement (Engage)
- Media Relations (Media)
- Visual Identity (Identity)
- Metrics (Metrics)

It is important to note that the timing in this matrix is assuming that implementation of the broader Parking Strategic Plan begins in spring 2018. The strategies outlined in 2018 are also much lighter than those outlined for 2019 and 2020. This is due to uncertainty about the timing for hiring/realigning County/City parking department staff. Matrix timing can be adjusted according the actual timing of implementation.

Table 1. Marketing Strategy Implementation Matrix - Year One

Marketing Strategy Recommendation		Responsible	Budget Considerations
Identity	Create and release an RFP for brand and visual identity development that aligns with the City and County's brands. Services to be included: • Development of Parking Department Vision, Mission, and Values • Logo • Brand identity standards • Templates for collateral • Uniform design Annual report template/design (could be paper or online infographic)	Future Parking Department Director, with support from County/City Marketing and Communications staff	Brand development: $7,500 - $10,000 depending on vendor and complexity of scope. It makes sense that the City and County would include the vendor who created their brands in this process.
Web Presence	Work with the County/City's Marketing and Communications staff to	Future Parking Department Director, with support from	• Dependent on current County/City contract stipulations

	outline web content for a new Parking Services web page.	County/City Marketing and Communications staff	$2,500 - $5,000 depending on complexity of site
Social	• Work with County/City Marketing and Communication staff to develop a 3rd and 4th quarter social media schedule for parking and transportation related posts. The purpose of these posts will be: o Begin tracking "likes", "retweets", and other social media interactions to see where customers are going most frequently. o Provide information about where customers can park. Continue the conversation with customers about this planning effort and implementation plans.	Community Development staff, with support from County/City Marketing and Communications staff	No cost beyond staff time.
Media	Create a comprehensive media contact list for the new Parking Director	Community Development staff, with support from County/City Marketing and Communications staff	No cost beyond staff time.
Staffing	Develop job description duties specific to communications and public engagement • Ideally, this position will be an FTE, however in the next few years, it could be a shared position with another department • Also explore collaborative opportunities with organizations like the Norman Downtowners Association for potential cost/staff sharing opportunities Explore opportunities for intern support of marketing, communications and social media tasks	Community Development and eventually the new Parking Director	No budget impact in 2015.

Engage	Develop an Annual Communications & Stakeholder Engagement Plan • Ideally, this would be done in late 2017, in preparation for 2018 Develop specific communications and stakeholder engagement budget	Community Development staff, in coordination with new Parking Director	$20,000 - $25,000 total communications budget for 2018. Includes funding for various campaigns and outreach efforts, with the majority of 2018 funding going towards department start-up costs (i.e., apparel, web design, etc.).
Metrics	• Identify data benchmarks that create accountability to both internal stakeholders (i.e., County/City leadership) and external stakeholders (i.e., patrons, partners). • Develop a patron and partner survey that is administered annually and that tracks similar items to begin building patters and provide data on program trends. See the next section, "Metrics to Measure Success" for additional detail.	Community Development staff, in coordination with new Parking Director	$500 - $750 for online tool like SurveyMonkey; assumes premium membership at $50/month. Less expensive options are available.

Table 2. Marketing Strategy Implementation Matrix – Year Two (2019-2020)

Marketing Strategy Recommendation		Responsible	Budget Considerations
Identity / Web	Launch new brand: • Selected vendor for visual identity development should work with staff to outline brand launch timeline, strategy, goals as part of their scope • Launch new parking department web page(s) Public education campaign	Parking Department Director and staff, in coordination with County/City Marketing and Communications staff	$2,500 - 5,000. Collateral materials, launch party, staff apparel, and other key marketing pieces.
Identity	Begin exploring additional parking signage and wayfinding needs. Depending on signage needs, work with Community Development/Marketing & Communications staff to create an RFP for additional signage needs	Parking Department staff, in coordination with County/City Marketing / Communications staff	TBD – based on needs, however a good signage system to consider is the ParkLine signage system by Pictoform (used in Boulder, CO).
Social	• Develop a social media policy • Develop a social media calendar, at least quarterly • Continue actively curating selected social media sites and/or working with County/City Marketing and Communications to provide fresh and relevant content for posting on the City and County's main social media sites • Monitor patron and partner engagement with sites to ensure ROI for staff time and effectiveness of each tool Leverage partnerships with partnering organizations (i.e., Norman Downtowners Association) to expand social media outreach efforts	Parking Department staff	$500 for staff training classes on latest social media engagement strategies.

Tools	Produce a 2016 Annual Report	Parking Department staff	Depends on vendor and quantity, however a reasonable estimate is: $7,500-$10,000 for design and printing hard copy version; $4,000-$5,000 for online version (depending on vendor).
Tools	Begin identifying no/low cost smart phone applications that increase customer service offerings (i.e., ParkMe)	Parking Department staff	No cost beyond staff time and training.
Media	Schedule in-person meetings with key news directors to inform the media about the role of the Parking Department, the department's main areas of focus, and the positive impacts that the community can expect to see as a result of the new organizational structure (include print, television, and digital media)	Parking Department Director and/or designated communications and public engagement staff liaison	$200 for creating press packets.
Media/PR	Begin building local and regional recognition for new brand via outreach efforts in partnership with local organizations: • Develop a public education campaign focused on helping residents and visitors find parking quickly and park legally • Co-host Bike to Work Day with local bicycle advocates (Spring) Participate in PARK(ing) Day 2018 (Fall)	Parking Department staff	Budget $2,500 - $3,500 for marketing campaign activities
Staffing	Establish at least a half time position to handle communications, customer engagement, and public relations for the Parking Department	Parking Department Director	Dependent on 2018 City and County staff salary rates.
Staffing	Develop performance measures for communications staff person that are tied to the goals outlined in the Annual Communication and Stakeholder Engagement Plan.	Parking Department Director	No cost beyond staff time.

PR	Begin developing a Crisis Communication Plan (see Appendix 35 for an example)	Parking Communications staff member, in partnership with Parking Department Director and County/City Administration	No cost beyond staff time.
Engage	Create 2019 Annual Communications & Stakeholder Engagement Plan by 4th quarter 2018 • Review effectiveness of 2017-2018 efforts by 3rd quarter 2018 Create communications and marketing budget for 2019 by 3rd quarter 2018	Parking Communications staff member, in partnership with Parking Department Director	$30,000 total communications budget for 2016. Includes limited funding for possible new signage implementation costs.
Metrics	• Establish data benchmarks and collect first round of baseline information Administer patron and partner survey.	Parking Communications staff member, in partnership with Parking Department Director	$500 - $700 for in-house execution; $5,000 - $7,500 for outsourced survey execution.

Table 3. Marketing Strategy Implementation Matrix – Year Three (2020 and Beyond)

Marketing Strategy Recommendation		Responsible	Budget Considerations
Identity / Web	• Continue signage installation (as needed) • Revisit organizational Vision, Mission, and Values to ensure that department programs and policies are still aligned with the organization's guiding principles Begin tracking website analytics and establish a schedule for making regular website updates, both in terms of content and functionality (i.e., online marketplace capabilities	Parking Communications staff member	• For signage installation: Dependent on what was accomplished in 2019 • For organizational values assessment, no cost beyond staff time Website updates: Dependent on staff time vs. outside vendor for maintenance and updates
Social	• Continue actively curating all social media sites • Begin tracking social media analytics Monitor patron and partner engagement with sites to ensure ROI for staff time and effectiveness of tool	Parking Communications staff member	No cost beyond staff time.
Tools	Produce 2019 Annual Report	Parking Communications staff member	$6,000 -$8,000 for design and printing of hard copy option (assumes use of previous materials/format); $3,000-$4,000 for online version.
Tools	Implement no/low cost smart phone applications that increase customer service offerings Includes educational campaign, marketing and signage	Parking Communications staff member	$2,000-$3,000 for public education, marketing and signage, if applicable.
Media	Continue active relationship building with local media, including annual meetings with news directors	Parking Communications staff member	No cost beyond staff time.
Staffing	• Continue staff development and training, including a review of staffing levels to support communications and stakeholder outreach activities	Parking Communications staff member and Parking Division Manager	$2,000 - $3,000 for staff training and possible paid intern.

	Consider developing a intern program to support this position if still at half/part time		
Media/PR	Continue building local and regional recognition for new brand via outreach efforts in partnership with local organizations: • Participate in PARK(ing) Day 2020 • Participate in "Bike to Work Day" Participate as a vendor/sponsor at popular local festivals/events	Parking Department staff, in partnership with local organizations like the Norman Downtowners Association	Budget $5,000 for new programs and possible sponsorship opportunities.
Engage	Create 2021 Annual Communications & Stakeholder Engagement Plan by 4th quarter 2020 • Review effectiveness of campaigns by 3rd quarter 2020 Create communications and marketing budget for 2021 by 3rd quarter 2020	Parking Communications staff member in partnership with the Parking Department Director	TBD based on activities outlined in 2020 Annual Communications and Stakeholder Engagement Plan.
Metrics	• Use data benchmarks and make adjustments to build 2020 Annual Marketing Plan and budget priorities (i.e., media impressions and Google Analytics) Administer patron and partner survey. By 2020 (the third year), there should be enough data to complete a trend analysis and make adjustments to budgeting per survey results.		$500 - $700 for in-house execution; $5,000 - $7,500 for outsourced survey execution.

Metrics to Measure Success

City and County leadership and staff should be commended for their commitment to including the community in the exploration of new, customer-focused initiatives like the Parking Strategic Plan. What the County/City rightly realizes is that metrics and benchmarks are an important aspect of instituting any program and for each initiative embarked upon, specific metrics should be established. A strategic and proactive communications and stakeholder engagement plan can lead to tremendous progress, but how does an organization truly know which tactics and campaigns are making the difference and when they have achieved "success"? The County/City should consider investing in one or several of the following tools and strategies for measuring both the success of outreach campaigns and customer satisfaction:

Surveys

Surveys are by far the most commonly used tool for organizations looking to track consumer and investor perceptions towards an organization or initiatives. Surveys should probe how well the organization is serving its constituents and identify what improvements and/or additional services they'd like to see. The prevalence of online survey tools like SurveyMonkey make it easy to bring some of the evaluation processes in house at significant cost savings for the parking program. However, when the program has a significant campaign, is looking to introduce a new technology and/or would like to ensure statistical significance for survey results, outsourcing survey distribution and analysis to an established market research firm is recommended. Several types of surveys can be conducted, including but not limited to:

- *Business Owner/Operator*: Determines perceptions, attitudes and preferences related to parking, mobility and its impacts on business operations and viability.
- *Customer Survey:* Determines the parking needs and concerns of a consumer or visitor.
- *Resident Survey:* Determines specific neighborhood and overflow parking concerns within the community.

Establish Data Benchmarks

Benchmarking data is an excellent way to measure the success of both annual and project/initiative-specific strategic planning efforts. We recommend that the following data and indicators be benchmarked and tracked as the communications and stakeholder outreach strategy is implemented:

- *Media Impressions:* Number of news clips in newspaper, magazine, television and radio. Using advertising costs, average the value of free mentions from public relations efforts.
- *Social Media Metrics:* Tracking social media analytics can be time-consuming, expensive, and/or seem like an exercise in futility but there are a few free tools that can be used to track your growing social media presence:
    - Hootsuite: Hootsuite is often used by organizations to manage of all of their social media accounts on one platform, however its recent partnership with Brandwatch has added the extra benefit of analytics.

- Twitter Analytics: Twitter Analytics allows users to track impressions, retweets, profile visits, mentions and increases or decreases in followers. And best of all, it's completely free.

- Facebook Page Insights: This free tool allows page managers to "view the page's performance, learn which posts have the most engagement and see data about when your target audiences are on Facebook" (Facebook.com; General Page Metrics)

- Website Metrics/Google Analytics: Google Analytics is a free tool provided by Google that is constantly being updated and improved. It will not only show you valuable data about your website visitors, how they got there (Google search keywords, referral or direct entry), and their location, but you can also monitor and view reports on their experience on the site – where they stayed the longest, what they were looking for, where they left, etc. This tool allows you to produce a variety of reports that can be measured upon for specific online campaigns, for overall usage over periods of time, and to help provide a basis for further improvements and/or to fix functions that may not be working as intended for the end users.

"Closing the Communications Loop"

County/City leadership and staff should be commended for their commitment to including the community in the exploration of new, customer-focused initiatives like the Parking Strategic Plan. Stakeholder engagement is a vital part of developing a successful parking and access management strategy that supports the community's larger economic development goals. Outreach to Cleveland County and downtown Norman's diverse constituencies, while not without its challenges and varied opinions, provides important insight into the real and perceived parking challenges regularly faced by merchants, property owners, employees, visitors, and the residents of Norman and Cleveland County.

Community engagement efforts can also play an important role in uncovering and promoting a shared vision for the future of a community or central business district. Creating a balanced engagement strategy that both identifies the current parking and access landscape – in the opinion of those who participate – and starts to build a shared vision for the future, is vital to the success of any planning effort long-term. A plan without a vision or shared community narrative is less likely to be successfully adopted, championed, and ultimately implemented.

In many communities that undertake a planning or study process like this one, communication with stakeholders about how their feedback was used to develop study or plan recommendations is often missing. After spending hours of time attending public meetings, taking surveys, and engaging in discussion, stakeholders often feel disenchanted with the process because they can't see their "fingerprints" when it comes time for recommendations on policies and programming to be made. In many communities, engagement grinds to a halt when the study is complete or the consultant leaves town, and stakeholders don't hear from their cities again until it is time for a new round of public meetings.

In downtown Norman – an environment where public engagement is a foundational element absolutely critical to the success of any new policy or program – it is really important to continue

communication and education throughout implementation, giving the stakeholders and general public an avenue to give feedback that could help refine the implementation process. This process – "Closing the Communication Loop" – also helps build trust and confidence that feedback given during the public involvement process was both heard and incorporated into the final recommendations. It is the hope of the consultant team that stakeholders will see their words and thoughts reflected in the public engagement chapter of the Parking Strategic Plan. It is also strongly recommended that this report be made available to the general public using a variety of formats, including social media, and through presentations to community groups.

Step Four: Performance Evaluation. In recent years, parking industry volunteers have been working to define a common set of Key Performance Indicators (KPIs) that can be applied across organizations and program types. Programs like the International Parking Institute's Accredited Parking Organization (APO) certification have taken benchmarking and organizational excellence to the next level and have helped create consistency in level of service expectations industry-wide.

Examples of the type of performance indicator that might help a parking and/or transportation organization track the progress and/or success of a communications plan include:

- Research (follow-up or post-wave research is often conducted to see if target audiences have changed attitudes or perceptions).
- Increase in desired behavior (i.e., more parking customers in a previously underutilized facility)
- Decrease in undesirable behavior (i.e., fewer neighborhood permit citations.
- Accurate and timely press coverage of an event, facility closure or new program.
- Impact to consumer perceptions (i.e., tracked through a decrease in complaint calls and/or via customer satisfaction survey).
- Website traffic, media impressions, and/or social media views/shares.
- Downloads of a new mobile application.

When considering what type of evaluation would be most appropriate for a particular organization, one easy mistake to avoid is starting your evaluation process at the wrong time. Performance indicators and evaluation criteria should be determined during the Discovery phase (Step 1) so that baseline data can be gathered. If one waits until the Implementation Phase to consider what benchmark might be appropriate to track the success of your communications plan, you won't know how your investment in various strategies impacted your ability to meet your goals and objectives.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ASSESSMENT STRATEGIES
Appendix 37

Parking Rate Assessment Strategies

A Recipe for Success

Presentation Overview

- Introduction
- Parking Rate Assessment Process Overview
- Innovative Tools and Processes
- Approval Processes
- Implementation
- Q & A

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INTRODUCTION

- To Boise…
- To CCDC…
- To Boise Parking…

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A Brief Introduction to Boise

- Capital of Idaho
- Population
- Home of Boise State University

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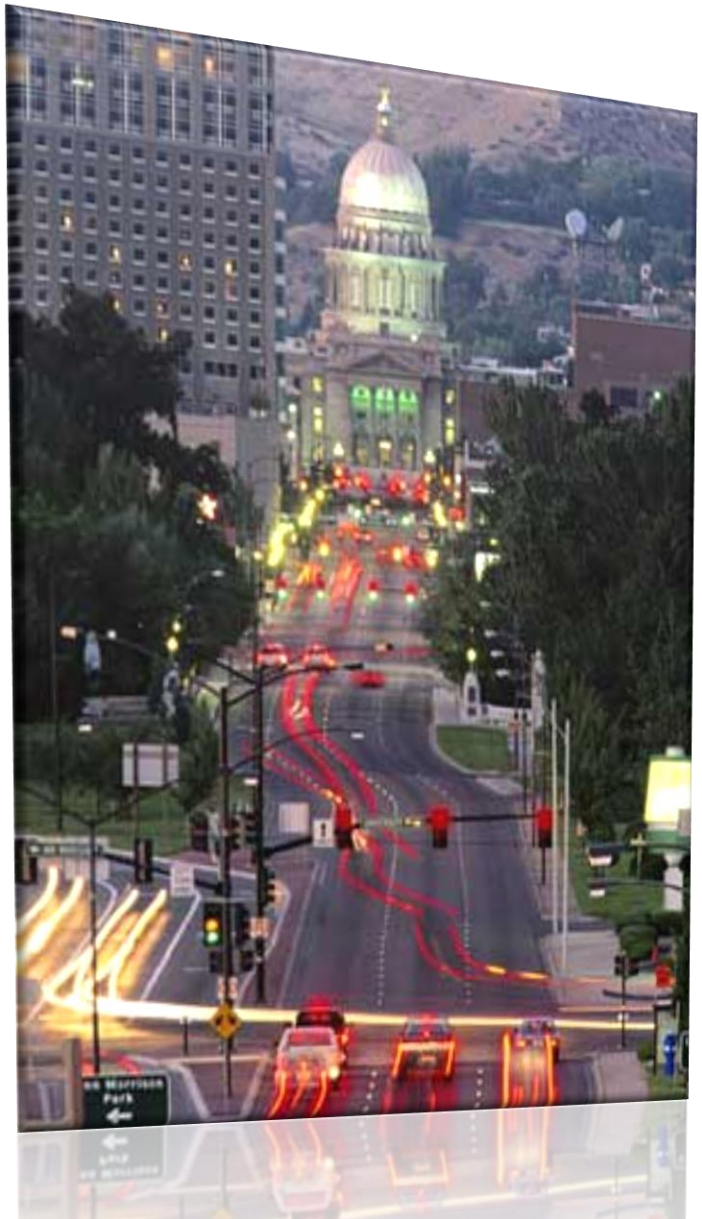
A Brief Introduction to Boise



- Located in Southwest Idaho
- Population of 225,000
- Idaho State Capital
- Home of Boise State University
- 43,000 daily commuters to downtown
- Regional Medical Hub
- Corporate Headquarters for:
  - » Micron
  - » Hewlett Packard
  - » Albertson's Groceries
  - » JR Simplot Corporation

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A Brief Introduction to CCDC

CAPITAL CITY DEVELOPMENT CORP.

- City's Urban Redevelopment Agency
- Agency Mission: Building Vitality in Boise's Downtown

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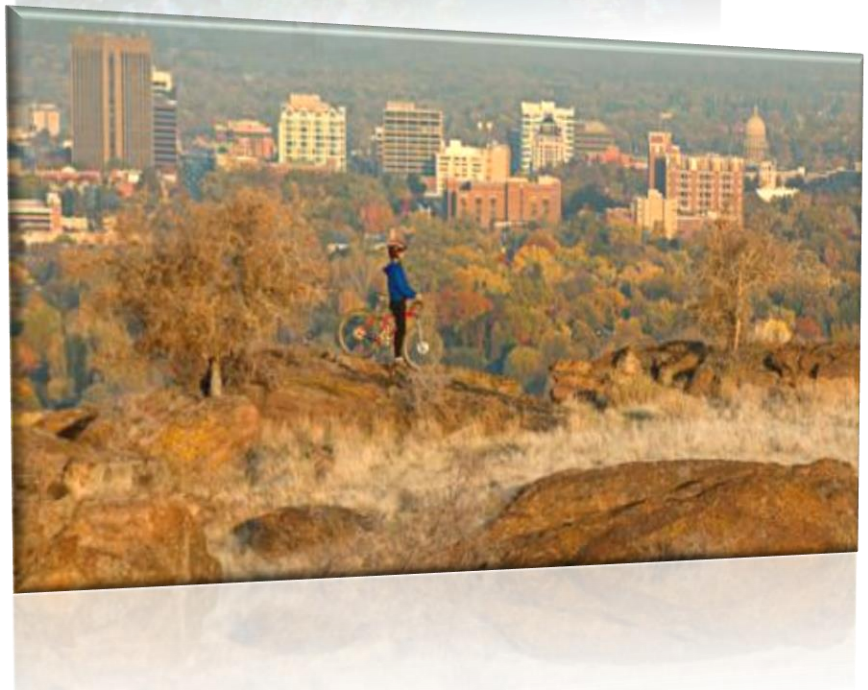
A Brief Introduction to CCDC



CAPITAL CITY DEVELOPMENT CORP.

- Vision for downtown Boise:
  - A place where there is a lively mixture of housing, workplaces, retail, cultural and educational activities and social spaces. A place that with a rich intellectual and cultural environment that attracts talented people and sparks creativity.

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A Brief Introduction to CCDC

Capital City Development Corp.

- City's Urban Renewal Agency
  - Agency Mission
  - Agency Initiatives
    - Preserve long-term health of downtown
    - Create investment strategy
    - Priming the pump; removing barriers
    - Stimulate private development
    - Create vitality

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A Brief Introduction to CCDC

CAPITAL CITY DEVELOPMENT CORP.

- Goals for downtown Boise:
  - Keep downtown as a center of the region
  - Achieve superb access and mobility
  - Grow in a healthy, sustainable way
  - Create a strong economy and a lively mix of uses
  - Make downtown a great place for people

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A Brief Introduction to CCDC

- Parking Management
  - City manages 3,000 on-street spaces
  - Agency manages 2,600 off street spaces in six structures
  - Referred to as the “Downtown Public Parking System"
  - Operated by Republic Parking Northwest

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A Brief Introduction to CCDC

- Central Parking District Rate Information:
  - First Hour Free
  - $2.50 each additional hour
  - Daily: $12.00 maximum
  - Monthly: $100 unreserved; $120 reserved
  - Event: $5 -$12

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Boise Parking Locations

Downtown Districts

- The Grove Plaza
- Central Downtown
- Old Boise Historic District
- The Capitol District
- Julia Davis Park and the Cultural District
- South Eighth Street Historic District (BoDo)

Hotels

1. Grove Hotel
   245 S Capitol Blvd. • (208) 333-8000
2. Hampton Inn & Suites
   495 S Capitol Blvd. • (208) 331-1900
3. Hotel 43
   981 W Grove St. • (208) 342-4622
4. Leku Ona Basque Hotel
   111 S 6th St. • (208) 345-6665
5. Owyhee Plaza Hotel
   1109 W Main St. • (208) 343-4611
6. Safari Inn Downtown
   1070 W Grove St. • (208) 344-6556
7. The Modern Hotel & Bar
   1314 W Grove St. • (208) 424-8244

Museums

1. Basque Museum
2. Idaho State Historical Museum
3. Black History Museum
4. Boise Art Museum

Points of Interest

1. Idaho Anne Frank Human Rights Memorial
2. The Cabin Literary Center
3. Boise Public Library
4. Zoo Boise
5. Boise Contemporary Theater
6. Esther Simplot Performing Arts Center
7. Discovery Center
8. Rose Garden

Parking

- Public Garages - First Hour Free
- Public Parking - No First Hour Free
- Pay Lots / Garages
- 20 Minutes Free

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PARKING RATE ASSESSMENT PROCESS OVERVIEW

- A Little Parking Background…
  - "Mission & Money" Study
  - IDA Advisory Panel
  - Four Year Rate Increase Cycle
  - Introduction of the "First Hour Free" Program
- Four Years Later…

Four Years Later…

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- Time to Reassess Parking Rates
  - CCDC Key Issues
    - Infrastructure Reinvestment
    - Economic Development Incentives
    - One-time Capital Needs
    - Other Program Enhancement Goals

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The Assignment…

- Reassess Parking Rates
  - Assess current programs & facilities
  - Identify and prioritize areas needing attention
  - Conduct rate analysis, including rate modeling tool and rate scenarios
  - Assess cost/benefit of First Hour Free Program
  - Conduct limited “Peer City” comparison
  - Outline program of facility maintenance and program enhancements

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INNOVATIVE TOOLS & PROCESSES

- Public Parking Taskforce
- "The Parking Rate Adjustment Primer"
- Comparative Parking Rate Analysis
- The CCDC "Parking Reinvestment Program"
- The Parking Rate Modeling Tool
- Marketing Firm "PAC Meeting Audits" and Product Output

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Public Parking Taskforce Reconstituted

- Community Engagement is Critical!
  - For this process, we engaged taskforce members who were very familiar in parking issues some of whom had had significant input into past changes that influenced the current program.
  - Made up of a variety of downtown stakeholders.

Parking Taskforce:

- Clay Carley, Chairman: Prop Owner/Developer
- John Eichmann: City Parking Services Mgr.
- Karen Sander: Exec Dir, Downtown Boise Assn.
- Jim Tomlinson: Office Building Owner & Develop
- Erik McLaughlin: Restaurant business owner
- Lil Kurek: Retail business owner
- Jan Stamps: Monthly business parking
- John May: CCDC Board liaison
- Max Clark: CCDC Staff
- Todd Bunderson: CCDC Staff (Agency CFO)
- Dennis Burns: Parking Consultant

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"The Parking Rate Adjustment Primer"

- Parking Rate Increase Fundamental Principles
  - ✧ Approaches
  - ✧ Processes
  - ✧ Variable Rate Options
  - ✧ Rate Increase Arguments

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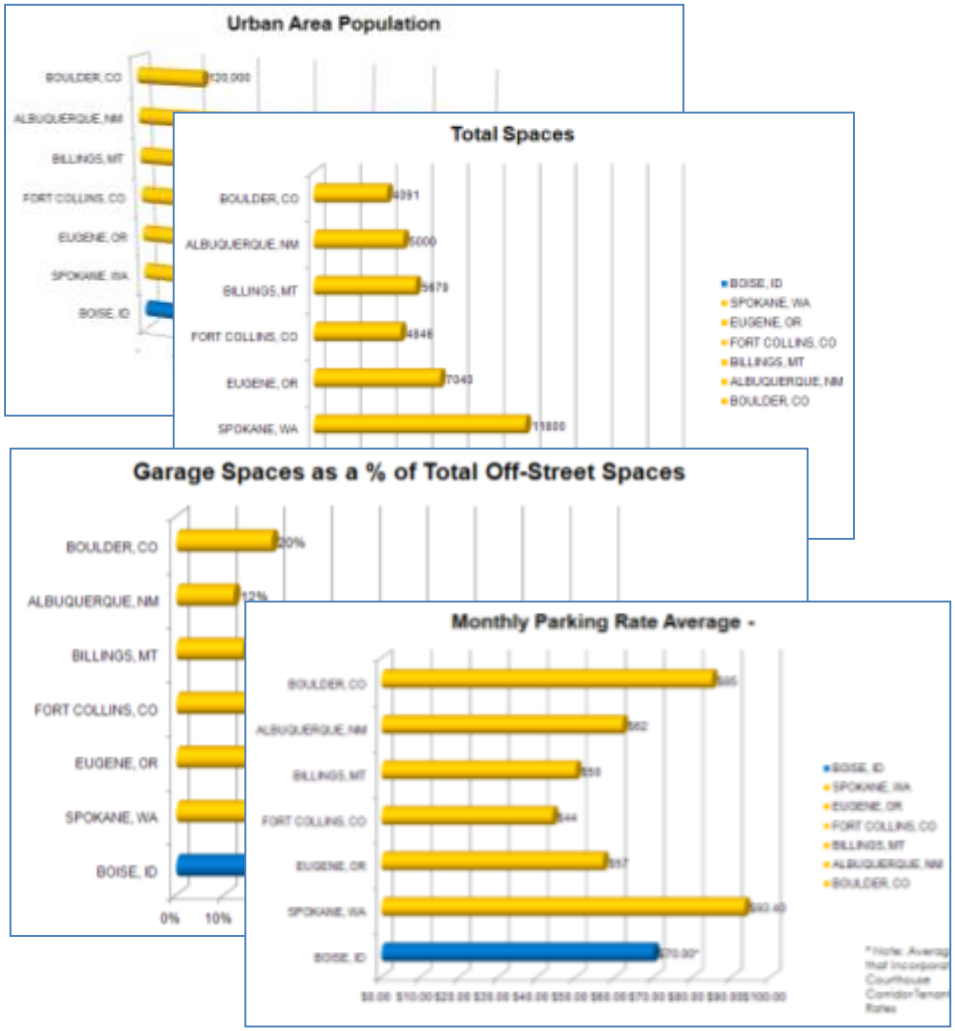
Comparative Parking Rate Analysis



- Conduct a “Peer City
  - Comparison” to assess parking rates, services offered and to indentify parking management best practices that may be applicable to Boise.
  - It is important when establishing “Peer Cities” is to make sure the parking programs are comparable.

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The CCDC "Parking Reinvestment Program"

- The next major step in the process was to develop a program of parking program investments.
  - This "Parking Reinvestment Strategy" also needed to reflect agency priorities and individual program element costs.
  - We also took this opportunity to reinforce the overall program and agency goals as part of an on-going community education strategy.

Parking Rate Assessment Strategies

A Recipe for Success

Capital City Development Corp.

Recommended Parking System Investment Plan

Carl Walker Parking Engineers Planners

"Goal Statement" "CCDC will develop and manage parking as a critical element of public infrastructure and as a tool to promote and sustain downtown economic development. One major goal of this rate planning cycle, based on this dual mission, is to maintain the successful 'First Hour Free' program due to it's significant economic benefits to a wide range of downtown stakeholders." Parking system investment will be guided by 2 primary principles - 'effective and responsive program management ' and 'making downtown Boise a more visitor-friendly and preferred regional destination'."

Infrastructure Reinvestment

To be a "good steward " of the public parking system, these tasks represent the minimum required investment needed to address system infrastructure debt service and bond covenant obligations & other agency prioritized projects.

Structural Preservation & Infrastructure Investment

Annual Costs
FY 09 – FY12

System Wide Structural Preservation
$200,000

Life Safety Equipment Maintenance
$50,000

Parking Repair and Replacement Fund /Bond Covenant and Principal / Interest Adjustments/TIF Debt Service Mix Adjustment / Downtown Urban Renewal Reinvestment
$250,000

Sub-Total Annual Costs: $500,000

Total Cost FY 09 – FY 12: 2,000,000

Total Cost: $2,000,000

One – Time Cost Projects

One Time Cost Projects
FY 09 – FY12

1. Integrated Revenue & Access Control System
2. Myrtle St Fire Proofing Encapsulation
3. City Centre Stairwell Preservation
4. Capitol Terrace Exterior Paint
5. Capitol Terrace Reversible Lane
6. Capitol Terrace Elevator Refurbish & Speed Up
7. Capitol Terrace Paint Stairwells & Elevator Lobbies
8. Boulevard Ramp Resurfacing

Total Cost: $830,000

Routine Maintenance & Equipment Replacement

This category covers routine maintenance issues and projects needed to keep the parking system's facilities operating at the standards demanded by the community and the agency. It also addresses planned replacement of equipment and systems that are reaching the end of their useful life.

Technology Planning & Operations

1. Pay-On-Foot Stations – City Center and Capital Terrace Garages – Pilot Program
2. E-Commerce Package (On-Line Permit purchases, etc.)
3. Multi-Space Meter Assessment & 8th Street Pilot Program

Total Cost: $487,600

Security, Lighting & Public Safety

1. Conduct a "Security Audit" and secure areas below stairwells and address other identified security issues.
2. Civic Plaza CCTV System for Delivery Entrance

Total Cost: $35,020

Facility Maintenance & Cleanliness

1. Replace Sweeper
2. Replace Maintenance Vehicle
3. Increased Maintenance Staff (2 FTEs)

Total Cost: $110,240

"Best-In-Class" Program Initiatives

Elevating the parking program from "Good to Great" is a strategy aimed at strengthening the downtown for benefit of all downtown stakeholders. It is aligned with the Mayor's initiative to making Boise one of the country's "Most Livable Cities". Projects in this category touch on key issues such as, safety, wayfinding, customer services, branding and marketing, communications and technology upgrades.

Signage & Wayfinding

1. Complete Exterior Facility Signage Package
   - Capital Terrace
   - Boulevard
   - Eastman
2. Garage Entrance Enhancements
   - Capital Terrace
   - Boulevard
   - City Center
   - Eastman

Total Cost: $403,200

Communications & Marketing

1. Comprehensive Branding & Marketing Strategy/Campaign
   - Parking E Newsletter
   - Parking Annual Report
2. Integrated Downtown/Parking Website Development (Co-op w/ DBA)
3. New Technology Introduction
4. Advertising in Facilities – Initial Capital Investment

Total Cost: $116,600

Facility Enhancements

1. Paint Garage Interiors
   - Capital Terrace
   - Eastman
   - Boulevard
   - Avenue A East
   - City Center
2. Level Theming & wayfinding - 2 facilities only this cycle. (In collaboration with City Arts & Culture Dept.)

Total Cost $874,000

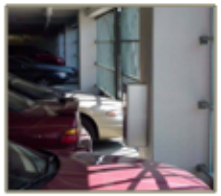
Sustainability & TDM Initiatives

1. Build in TDM strategies to complement parking and transit programs.
2. Promote "unbundling" of parking.
3. Promote Car Sharing programs.
4. Promote Bike Concierge Programs such as "Bike Station", "Cycle Station", etc.
5. Promote Bike Racks as Art Programs.

Total Cost: $125,750

Recommended Parking System Investment Plan

FY 2009 – FY 2012 Total Plan Budget - $4,982,410









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The CCDC "Parking Reinvestment Program"

- The primary objectives that this tool was designed to address included:
  - Prioritization of certain categories of expenses/investments
  - Ability to present relative costs by investment categories
  - Line item pricing for investment items within categories
  - Ability to include cost escalation factors for items that would not be addressed in year one
  - Flexibility in making adjustments to the recommended investment program based on changes in parking rate increases and/or changes to economic conditions.

Parking Rate Assessment Strategies

A Recipe for Success

Capital City Development Corp.

Recommended Parking System Investment Plan

Carl Walker

Line Item Costs and Assumptions

Infrastructure Reinvestment

Structural Preservation & Infrastructure Investment

Annual Costs
FY 09 – FY12

System Wide Structural Preservation
$200,000
Life Safety Equipment Maintenance
$50,000
Parking Repair and Replacement Fund /Bond Covenant and Principal / Interest Adjustments/TIF Debt Service Mix Adjustment / Downtown Urban Renewal Reinvestment
$250,000

Sub-Total Annual Costs: $500,000

Total Cost FY 09 – FY 12: 2,000,000

Total Cost: $2,000,000

One – Time Cost Projects

One Time Cost Projects
FY 09 – FY12

1. Integrated Revenue & Access Control System
2. Myrtle St Fire Proofing Encapsulation
3. City Centre Stairwell Preservation
4. Capitol Terrace Exterior Paint
5. Capitol Terrace Reversible Lane
6. Capitol Terrace Elevator Refurbish & Speed Up
7. Capitol Terrace Paint Stairwells & Elevator Lobbies
8. Boulevard Ramp Resurfacing

Cost: $724,000
Cost Escalation (3% x 3 years) : $106,000

Total Cost: $830,000

Total Cost: $830,000

Routine Maintenance & Equipment Replacement

Technology Planning & Operations

1. Pay-On-Foot Stations – City Center and Capital Terrace Garages – Pilot Program
   - 6 POF Units x $65K = $390,000
   - $40 K Installation & Signage
2. E-Commerce Package
   - On-Line Permit purchases, etc.
   - $30 K (Assumes prior purchase of web-based program)
3. Multi-Space Meter Assessment

Cost: $460,000
Cost Escalation (3% x 2 years) : $27,600

Total Cost: $487,600

Total Cost: $487,600

Security, Lighting & Public Safety

1. Conduct a "Security Audit" and secure areas below stairwells and address other identified security issues.
   - $30 K
2. Civic Plaza CCTV System for Delivery Entrance
   - $4 K

Cost: $34,000
Cost Escalation (3% x 1 year): $1,020

Total Cost: $35,020

Total Cost: $35,020

Facility Maintenance & Cleanliness

1. Replace Sweeper
   - $24K
2. Replace Maintenance Vehicle
   - $20K
2. Increased Maintenance Staff
   - 2 FTEs - $62K

Cost: $106,000
Cost Escalation (4% x 4 year): $4,240

Total Cost: $110,240

Total Cost: $110,240

"Best-In-Class" Program Initiatives

Signage & Wayfinding

1. Complete Exterior Facility Signage Package
   - Capital Terrace
     - 2 Signs @ $45K
   - Boulevard
     - 1 Sign @ $45K
   - Eastman
     - 2 Signs @ $45K
2. Garage Entrance Enhancements
   - Design Costs
     - $15K
   - Capital Terrace
     - 2 Entries @ $30K
   - Boulevard
     - 1 Entry @ $30K
   - City Center
     - 1 Entry @ $30K
   - Eastman
     - 2 Entries @ $30K

Cost: $360,000
Cost Escalation (3% x 4 years): $43,200

Total Cost: $403,200

Total Cost: $403,200

Communications & Marketing

1. Comprehensive Branding & Marketing Strategy/Campaign
   - $35 K
     - Parking E Newsletter
     - Parking Annual Report
2. Integrated Downtown/Parking Website Development (Co-op w/ DBA)
   - $50 K
3. New Technology Introduction
   - $10 K
4. Advertising In Facilities – Initial Capital Investment
   - $15 K

Cost: $110,000
Cost Escalation (3% x 2 years): $6,600

Total Cost: $116,600

Total Cost: $116,600

Facility Enhancements

1. Paint Garage Interiors
   - Capital Terrace
     - $125K
   - Eastman
     - $125K
   - Boulevard
     - $125K
   - Avenue A East
     - $125K
   - City Center
     - $125K
2. Level Theming & wayfinding - 2 facilities only this cycle. (In collaboration with City Art & Culture Dept.)
   - $100K x 2

Cost: $825,000
Cost Escalation (3% x 2 yrs.): $49,500

Total Cost: $874,500

Total Cost: $874,000

Sustainability & TDM Initiatives

1. Build in TDM strategies to complement parking and transit programs.
2. Promote "unbundling" of parking.
3. Promote Car Sharing programs.
4. Promote Bike Concierge Programs such as "Bike Station", "Cycle Station", etc.
5. Promote Bike Racks as Art Programs.

Cost: $25,000
Cost Escalation (3% x 1 year): $750

Total Cost: $125,750

Total Cost: $125,750

Recommended Parking System Investment Plan

FY 2009 – FY 2012

Total Plan Budget - $4,982,410

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The CCDC "Parking Reinvestment Program

"Anticipated Benefits"

- Beyond just listing and estimating investment plan line items, we also developed, for each line item, a description of "anticipated benefits" that the agency/community would realize from the investment.

Parking Rate Assessment Strategies

A Recipe for Success

Capital City Development Corp.

Recommended Parking System Investment Plan

Carl Walker

Anticipated Benefits

Infrastructure Reinvestment

Structural Preservation & Infrastructure Investment	Anticipated Benefits	One – Time Cost Projects	Anticipated Benefits
Annual Costs FY 09 – FY12	Annual Costs FY 09 – FY12	One Time Cost Projects FY 09 – FY12	One Time Cost Projects FY 09 – FY12
System Wide Structural Preservation $200,000 Life Safety Equipment Maintenance $50,000 Parking Repair and Replacement Fund /Bond Covenant and Principal / Interest Adjustments/TIF Debt Service Mix Adjustment / Downtown Urban Renewal Reinvestment $250,000 Sub-Total Annual Costs: $500,000 **Total Cost FY 09 – FY 12: 2,000,000**	▪ Protection of parking system investment in physical assets. ▪ Reduced costs long-term ▪ Improves patron experience of the garages and enhances confidence in the system management ▪ Specific tasks include: concrete crack routing and sealing, waterproofing, expansion joint replacement, etc. ▪ Reduces system liability by proactively addressing life safety issues. ▪ Supports CCDC's "dual mission" of parking system management and urban renewal through continued reinvestment in downtown.	Integrated Revenue & Access Control System Myrtle St Fire Proofing Encapsulation City Centre Stairwell Preservation Capitol Terrace Exterior Paint Capitol Terrace Reversible Lane/Capitol Terrace Elevator Refurbish & Speed Up/Capitol Terrace Paint Stairwells & Elevator Lobbies Boulevard Ramp Resurfacing	▪ Existing Parking Access and Revenue Control System is approaching the end of its "useful life" and needs to be replaced. New recommended web-based management platform will leverage newer technologies to provide new customer-friendly system features and enhanced management reporting. ▪ Maintains structural fire rating and will eliminate maintenance issues associated with existing conditions. ▪ Addresses higher maintenance requirements on the south-side stairwells. Required to support facility maintenance standards. ▪ Much needed aesthetic upgrade to the high-profile "flagship facility" of the downtown parking system. An opportunity for "updating" the color scheme as the original coordinated color scheme on multiple buildings has been left behind. ▪ With the addition of a new housing project to this mixed-use facility, adding a reversible lane will provide enhanced entry/exit capacity to improve garage service levels. Additional system and interior facility updates are needed to support the existing customer base as well as to refurbish the property to support new investment in the area. ▪ This general maintenance project is needed to counteract normal wear of the steep ramp's drive surface. This is also a proactive safety measure that will reduce potential liability.
Total Cost: $2,000,000		**Total Cost: $830,000**	

Recommended Parking System Investment Plan

FY 2009 – FY 2012

Total Plan Budget - $4,982,410

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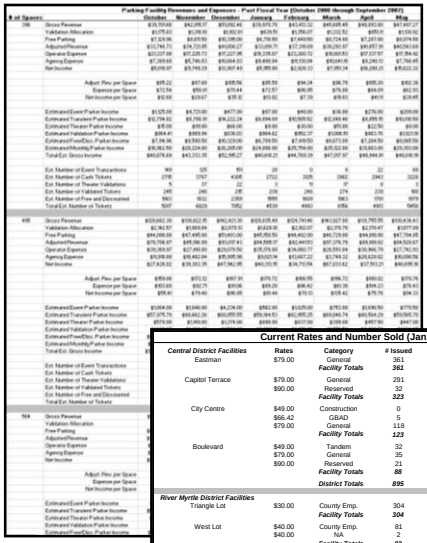
The Parking Rate Adjustment Modeling Tool

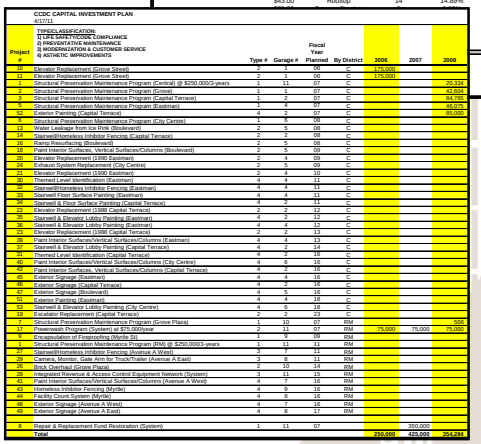
Model Description

- Spreadsheet model developed using analysis of two years worth of financial data.
- Final inputs focused on previous complete fiscal year and included (by facility):
  - Transient Revenues and Rates
  - Validations
  - Event Parking Revenues and Rates
  - Free and Discount Parking
  - Ticket counts
  - Monthly Parking Revenues and Weighted Avg. Rates
  - All Facility Expenses
  - Capital Investment Plan Projections



Current Rates and Number Sold (Jan. 2008)

Central District Facilities	Rates	Category	# Issued	% of Total	Weighted Average Rate
Eastman	$79.00	General	361	100.00%	
		Facility Totals	*361*	*100.00%*	*$79.00*
Capitol Terrace	$79.00	General	291	90.09%	
	$90.00	Reserved	32	9.91%	
		Facility Totals	*323*	*100.00%*	*$80.09*
City Centre	$49.00	Construction	0	0.00%	
	$66.42	GBAD	5	4.07%	
	$79.00	General	118	95.93%	
		Facility Totals	*123*	*100.00%*	*$78.49*
Boulevard	$49.00	Tandem	32	36.36%	
	$79.00	General	35	39.77%	
	$90.00	Reserved	21	23.86%	
		Facility Totals	*88*	*100.00%*	*$70.72*
		District Totals	*895*		
River Myrtle District Facilities					
Triangle Lot	$30.00	County Emp.	304	100.00%	
		Facility Totals	*304*	*100.00%*	*$30.00*
West Lot	$40.00	County Emp.	81	97.59%	
	$40.00	NA	2	2.41%	
		Facility Totals	*83*	*100.00%*	*$40.00*
Civic Plaza Garage	$50.00	County Emp.	91	22.86%	
	$43.00	Night	0	0.00%	
	$49.00	Tandem	45	11.31%	
	$55.30	Rate Pub. Agency	165	41.46%	
	$63.20	Rate Priv. Agency	47	11.81%	
	$79.00	General	34	8.54%	
	$90.00	Reserved	16	4.02%	
		Facility Totals	*398*	*100.00%*	*$57.73*
Myrtle Garage	$15.00	County Emp.	3	3.19%	
	$39.00	Construction	0	0.00%	
	$43.00	Rooftop	14	14.89%	



CCDC CAPITAL INVESTMENT PLAN
4/17/11

TYPE/CLASSIFICATION:
1) LIFE SAFETY/CODE COMPLIANCE
2) PREVENTATIVE MAINTENANCE
3) MODERNIZATION & CUSTOMER SERVICE
4) AESTHETIC IMPROVEMENTS

Project #	Type #	Garage #	Planned	By District	Fiscal Year 2006	2007	2008
10	2	1	06	C	175,000		
11	2	1	06	C	175,000		
1	1	1	07	C			20,334
2	1	1	07	C			42,904
3	1	2	07	C			84,768
5	1	4	07	C			46,075
12	4	2	07	C			85,000
6	1	6	08	C			
13	2	5	08	C			
14	2	2	08	C			
16	2	3	08	C			
18	2	5	09	C			
19	2	4	09	C			
24	2	5	09	C			
21	2	4	10	C			
30	4	4	11	C			
32	4	4	11	C			
33	4	4	11	C			
34	4	2	11	C			
22	2	2	12	C			
26	4	2	12	C			
36	4	4	12	C			
23	2	2	13	C			
39	4	13	14	C			
37	4	2	14	C			
31	4	2	16	C			
40	4	6	16	C			
42	4	2	16	C			
45	4	4	16	C			
46	4	2	16	C			
47	4	5	16	C			
51	4	4	18	C			
53	4	4	18	C			
10	2	2	23	C			
7	1	10	07	RM			500
17	2	11	07	RM	75,000	75,000	75,000
9	1	9	09	RM			
1	1	11	11	RM			
27	3	7	11	RM			
29	3	8	11	RM			
35	2	10	14	RM			
28	3	11	15	RM			
41	4	7	16	RM			
43	4	9	16	RM			
44	4	9	16	RM			
48	4	7	16	RM			
49	4	8	17	RM			
8	1	11	07		350,000		
					250,000	*425,000*	*354,281*

CAPITAL CITY DEVELOPMENT CORP.

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The Parking Rate Adjustment Modeling Tool

- Model Adjustment Options
  - Projection of possible net revenues based on adjustments in:
    - Demand Elasticity Assumptions
    - Transient Rates per Year
    - Transaction Types
    - Continuation of First Hour Free
    - Monthly Rates per Year and Facility
    - Monthly Permit Mixes
    - Validation Values (% of Transient)
    - Event Rates (by Year)
    - Operator and Agency Expenses
    - Facility User Mixes
    - Capital Investment Plans

	October	November
Gross Revenue	$39,701.66	$42,015.17
Validation Allocation	$1,175.03	$1,318.18
Free Parking	$7,129.96	$8,611.50
Adjusted Revenue	$33,746.73	$34,721.85
Operator Expense	$21,337.08	$17,225.73
Agency Expense	$7,389.68	$5,746.83
Net Income	$5,019.97	$11,749.29
Adjust. Rev. per Space	$85.22	$87.68
Expense per Space	$72.54	$58.01
Net Income per Space	$12.68	$29.67
Estimated Event Parker Income	$1,125.00	$4,721.00
Estimated Transient Parker Income	$12,794.82	$8,786.91
Estimated Theater Parker Income	$15.00	$111.00
Estimated Validation Parker Income	$864.41	$989.94
Estimated Free/Disc. Parker Income	$7,114.96	$8,500.50
Estimated Monthly Parker Income	$18,962.50	$20,224.00
Total Est. Gross Income	$40,876.69	$43,333.35
Est. Number of Event Transactions	149	125
Est. Number of Cash Tickets	2715	3787
Est. Number of Theater Validations	5	37
Est. Number of Validated Tickets	245	248
Est. Number of Free and Discounted	1903	1832
Total Est. Number of Tickets	5017	6029

The Parking Rate Adjustment Modeling Tool

Assumption concerning changes in demand due to increases - A 1% increase in prices will result in a | 0.20% | reduction in demand.

Rate and Expense Adjustments

Transient Rates

	2007	2008	2009	2010	2011	2012
Current Transient Rate (per hour):	$1.50					
New Transient Rate (per hour): →		$1.50	$1.50	$1.50	$1.50	$1.50
Transient Rate Percentage Increase: →		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Maintain First Hour Free?: →		*YES*	*YES*	*YES*	*YES*	*YES*

Monthly Rates

	2007	Projected Rates (Based on Rate Adjustment Entered in Yellow Cells)				
Current Weighted Average Monthly Parking Rates		2008	2009	2010	2011	2012
Eastman Garage	$79.00	*$79.00*	*$79.00*	*$79.00*	*$79.00*	*$79.00*
Capitol Terrace Garage	$80.09	*$80.09*	*$80.09*	*$80.09*	*$80.09*	*$80.09*
City Centre Garage	$78.49	*$78.49*	*$78.49*	*$78.49*	*$78.49*	*$78.49*
Boulevard Garage	$70.72	*$70.72*	*$70.72*	*$70.72*	*$70.72*	*$70.72*
Triangle Lot	$30.00	*$30.00*	*$30.00*	*$30.00*	*$30.00*	*$30.00*
West Lot	$40.00	*$40.00*	*$40.00*	*$40.00*	*$40.00*	*$40.00*
Civic Plaza Garage	$57.73	*$57.73*	*$57.73*	*$57.73*	*$57.73*	*$57.73*
Myrtle Street Garage	$73.00	*$73.00*	*$73.00*	*$73.00*	*$73.00*	*$73.00*
Grove Street Garage	$66.33	*$66.33*	*$66.33*	*$66.33*	*$66.33*	*$66.33*
Monthly Parking Rate Adjustment ($ Increase per Year)		2008	2009	2010	2011	2012
Eastman Garage →		$0.00	$0.00	$0.00	$0.00	$0.00
Capitol Terrace Garage →		$0.00	$0.00	$0.00	$0.00	$0.00
City Centre Garage →		$0.00	$0.00	$0.00	$0.00	$0.00
Boulevard Garage →		$0.00	$0.00	$0.00	$0.00	$0.00
Triangle Lot →		$0.00	$0.00	$0.00	$0.00	$0.00
West Lot →		$0.00	$0.00	$0.00	$0.00	$0.00
Civic Plaza Garage →		$0.00	$0.00	$0.00	$0.00	$0.00
Myrtle Street Garage →		$0.00	$0.00	$0.00	$0.00	$0.00
Grove Street Garage →		$0.00	$0.00	$0.00	$0.00	$0.00

Validation Rates

	2007	2008	2009	2010	2011	2012
Current Validation Value (as a % of Transient Rate):	100%					
Projected Validation Value (as a % of Transient Rate): →		100.00%	100.00%	100.00%	100.00%	100.00%

Event Rates

	2008	2009	2010	2011	2012
Projected Event Rate Adjustment (as a % of Previous Year): →	0.00%	0.00%	0.00%	0.00%	0.00%

Expense Adjust.

	2008	2009	2010	2011	2012
Adjustment to Operator Expenses (as a % Increase): →	3.00%	3.00%	3.00%	3.00%	3.00%
Adjustment to Agency Expenses (as a % Increase): →	3.00%	3.00%	3.00%	3.00%	3.00%

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The Parking Rate Adjustment Modeling Tool

Model Outputs

- Projection of revenues (by type)
- Projection of free and validated parking costs
- Projection of expenses
- Estimated net income
- Projections also grouped by TIF district (Central and River Myrtle)
- Comparison to base year

Parking Revenue and Expense Projections

Central District	2007	2008	2009	2010	2011	2012
Eastman						
Gross Revenue	$557,836	$720,520	$736,078	$751,464	$766,688	$781,761
Free Parking	$96,820	$182,882	$182,882	$182,882	$182,882	$182,882
Adjusted Revenue	$461,016	$537,638	$553,196	$568,582	$583,806	$598,879
Operator Expense	$230,671	$237,591	$244,719	$252,060	$259,622	$267,411
Agency Expense	$109,058	$112,329	$115,699	$119,170	$122,745	$126,428
Net Income	$121,288	$187,718	$192,778	$197,352	$201,439	$205,041
Projected Transient Parking Revenue →		$180,615	$180,615	$180,615	$180,615	$180,615
Projected Monthly Parking Revenue →		$331,651	$347,209	$362,595	$377,819	$392,892
Projected Validation Revenue →		$17,245	$17,245	$17,245	$17,245	$17,245
Projected Event Parking Revenue →		$8,127	$8,127	$8,127	$8,127	$8,127
Free Parking Revenue (Loss) →		$182,026	$182,026	$182,026	$182,026	$182,026
Theater Parking Revenue (Loss) →		$856	$856	$856	$856	$856
TOTALS		$720,520	$736,078	$751,464	$766,688	$781,761

The Parking Rate Adjustment Modeling Tool

Parking System Investment Plan – Draft

Rate Increase Scenarios

Note: All Options preserve "First Hour Free"

Option	Hourly	Monthly	Annual $	4-Yr Total	Average Annual
A					
Year 1 (FY09)	$2.00	$85.00	$506,326		
Year 2 (FY10)	$2.00	$85.00	$431,368		
Year 3 (FY11)	$2.00	$85.00	$354,162		
Year 4 (FY12)	$2.00	$85.00	$274,639	$1,566,495	$391,624
B					
Year 1 (FY09)	$2.00	$90.00	$5		
Year 2 (FY10)	$2.00	$90.00	$4		
Year 3 (FY11)	$2.00	$90.00	$4		
Year 4 (FY12)	$2.00	$90.00	$3		
C					
Year 1 (FY09)	$2.00	$95.00	$6		
Year 2 (FY10)	$2.00	$95.00	$5		
Year 3 (FY11)	$2.00	$95.00	$4		
Year 4 (FY12)	$2.00	$95.00	$3		
D					
Year 1 (FY09)	$2.00	$100.00	$6		
Year 2 (FY10)	$2.00	$100.00	$5		
Year 3 (FY11)	$2.00	$100.00	$5		
Year 4 (FY12)	$2.00	$100.00	$4		

Recommended Parking System Investment Plan

Rate Increase Scenarios

Note: All Options preserve "First Hour Free"

Option	Hourly	Monthly	Annual $	4-Yr Total	Average Annual
Q					
Year 1 (FY09)	$3.00	$85.00	$1,347,082		
Year 2 (FY10)	$3.00	$85.00	$1,272,125		
Year 3 (FY11)	$3.00	$85.00	$1,194,918		
Year 4 (FY12)	$3.00	$85.00	$1,115,396	$4,929,521	$1,232,380
R					
Year 1 (FY09)	$3.00	$90.00	$1,404,472		
Year 2 (FY10)	$3.00	$90.00	$1,329,514		
Year 3 (FY11)	$3.00	$90.00	$1,252,308		
Year 4 (FY12)	$3.00	$90.00	$1,172,785	$5,159,079	$1,289,770
S					
Year 1 (FY09)	$3.00	$95.00	$1,459,698		
Year 2 (FY10)	$3.00	$95.00	$1,384,731		
Year 3 (FY11)	$3.00	$95.00	$1,307,528		
Year 4 (FY12)	$3.00	$95.00	$1,228,003	$5,379,960	$1,344,990
T					
Year 1 (FY09)	$3.00	$100.00	$1,512,734		
Year 2 (FY10)	$3.00	$100.00	$1,437,776		
Year 3 (FY11)	$3.00	$100.00	$1,360,570		
Year 4 (FY12)	$3.00	$100.00	$1,281,048	$5,592,128	$1,398,032

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"Parking Reinvestment Program" + Parking Rate Model

- "Rate Assessment Flexibility"

  - After adding up all the desired program investments, the total investment amount was compared to rate model out puts to see how much rates would have to raised to pay for the desired investment program.
  - The following iteration of the parking reinvestment plan shows how line items were "reprioritized" to match projected revenues with estimated expenses.

Parking Rate Assessment Strategies

A Recipe for Success

Capital City Development Corp.

Revised Parking System Investment Plan – Final Draft May 5, 2008

Carl Walker Parking Engineering Resources

Line Item Costs and Assumptions

Infrastructure Reinvestment

Structural Preservation & Infrastructure Investment

Annual Costs - FY 09 – FY12

System Wide Structural Preservation
$140,000($700,000/5 years)

Life Safety Equipment Maintenance
Non-routine maintenance of elevators, CO2 systems & emergency generators
$40,000 (5 year Cycle)

Parking Repair and Replacement Fund / TIF Debt Service Mix Adjustment / Downtown Urban Renewal Reinvestment
$250,000

Sub-Total Annual Costs: $430,000

Total Cost FY 09 – FY 12: 1,720,000

Total Cost: $1,720,000

One – Time Cost Projects

One Time Cost Projects FY 09 – FY12

1. Integrated Revenue & Access Control System
2. Myrtle St Fire Proofing Encapsulation
3. City Centre Stairwell Preservation
4. Capitol Terrace Exterior Paint
5. Capitol Terrace Reversible Lane
6. Capitol Terrace Elevator Refurbish & Speed Up
7. Capitol Terrace Paint Stairwells & Elevator Lobbies
8. Boulevard Ramp Resurfacing

Cost: $724,000
Cost Escalation (3% x 3 years) : $65,160

Total Cost: $789,160

Total Cost: $789,160

Infra-Structure Reinvestment Total Cost: $2,509,160

Non-Routine Maintenance & Technology Upgrades

Facility Maintenance & Cleanliness

1. Replace Sweeper
   - $24K
2. Replace Maintenance Vehicle
   - $20K
2. Increased Maintenance Staff
   - 2 FTEs - $62K

Cost: $106,000
Cost Escalation (4% x 4 year): $16,960

Total Cost: $122,960

Total Cost: $122,960

Security, Lighting & Public Safety

1. Conduct a "Security Audit" and secure areas below stairwells and address other identified security issues.
   - $20 K
2. Civic Plaza CCTV System for Delivery Entrance
   - $4 K

Cost: $24,000
Cost Escalation (3% x 1 year): $720

Total Cost: $24,720

Total Cost: $24,720

Technology Planning & Operations

1. Pay-On-Foot Stations – City Center and Capital Terrace Garages – Pilot Program
   - 6 POF Units x $65K = $390,000
   - $40 K Installation & Signage
2. E-Commerce Package $30,000
3. Multi-Space Meter Assessment - $25,000

Cost: $495000
Cost Escalation (3% x 2 years) : $29,700

Total Cost: $524,700

Total Cost: $524,700

Non-Routine Maintenance Total Cost: $672,380

"Best-In-Class" Program Initiatives

Signage & Wayfinding

1. Complete Exterior Facility Signage Package
   - Capital Terrace
     - 2 Signs @ $45K
   - Boulevard
     - 1 Sign @ $45K
   - Eastman
     - 2 Signs @ $45K
2. Garage Entrance Enhancements
   - Design Costs
     - $15K
   - Capital Terrace
     - 2 Entries @ $30K
   - Boulevard
     - 1 Entry @ $30K
   - City Center
     - 1 Entry @ $30K
   - Eastman
     - 2 Entries @ $30K

Cost: $420,000
Cost Escalation (3% x 4 years): $50,400

Total Cost: $470,400

Total Cost: $470,400

Communications & Marketing

1. Comprehensive Branding & Marketing Strategy/Campaign
   - $35 K
   - Parking E Newsletter
   - Parking Annual Report
2. Integrated Downtown/Parking Website Development (Co-op w/ DBA)
   - $10 K
3. New Technology Introduction
   - $10 K
4. Advertising In Facilities – Initial Capital Investment
   - $10 K

Cost: $65,000
Cost Escalation (3% x 2 years): $3,900

Total Cost: $68,900

Total Cost: $68,900

Facility Enhancements

1. Paint Garage Interiors
   - Capital Terrace
     - $125K
   - Eastman
     - $125K
2. Level Theming & wayfinding – 1 facility only this cycle. (In collaboration with City Art & Culture Dept.)
   - $100K

Cost: $350,000
Cost Escalation (3% x 2 yrs.): $21,000

Total Cost: $371,000

Total Cost: $371,000

Sustainability & TDM Initiatives

1. Build in TDM strategies to complement parking and transit programs.
2. Promote "unbundling" of parking.
3. Promote Car Sharing programs.
4. Promote Bike Concierge Programs such as "Bike Station", "Cycle Station", etc.
5. Promote Bike Racks as Art Programs.

Cost: $25,000
Cost Escalation (3% x 1 year): $2,250

Total Cost: $27,250

Total Cost: $27,250

"Best-In-Class" Initiatives Total Cost: $937,550

Infra-Structure Reinvestment & Routine Maintenance Total Cost: $3,181,540

Total: 4,119,090 - Contingency: $1,174

Recommended Parking System Investment Plan

FY 2009 – FY 2012

Total Plan Budget - $4,120,804

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Strategic Communications

Marketing Firm "PAC Meeting Audits" and Product Output

- Thinking Ahead about Communication
  - Rate Increase Q&A Developed: Short and Long Versions
  - Flyer Developed
  - "Meeting Audits"
    - Observed the PAC fully engaged in analysis
    - Better Understanding and Grasp of the Issues
    - Deliverables
      - Q & A Product – Short and Long
      - Brochure

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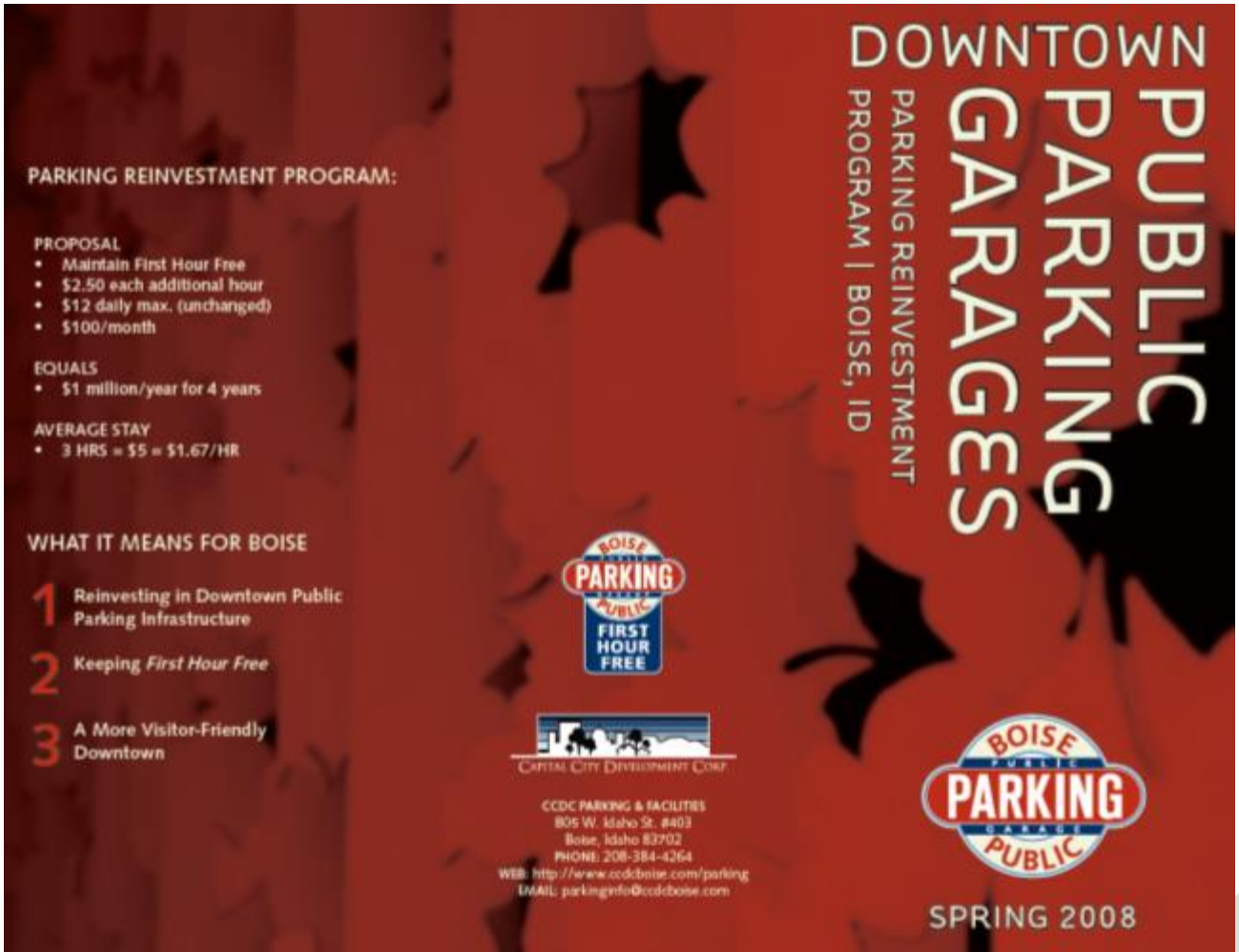
Implementation:

Communications

- Marketing Brochure



- Segment and target your audience
- Massage the message
- Message delivery strategies

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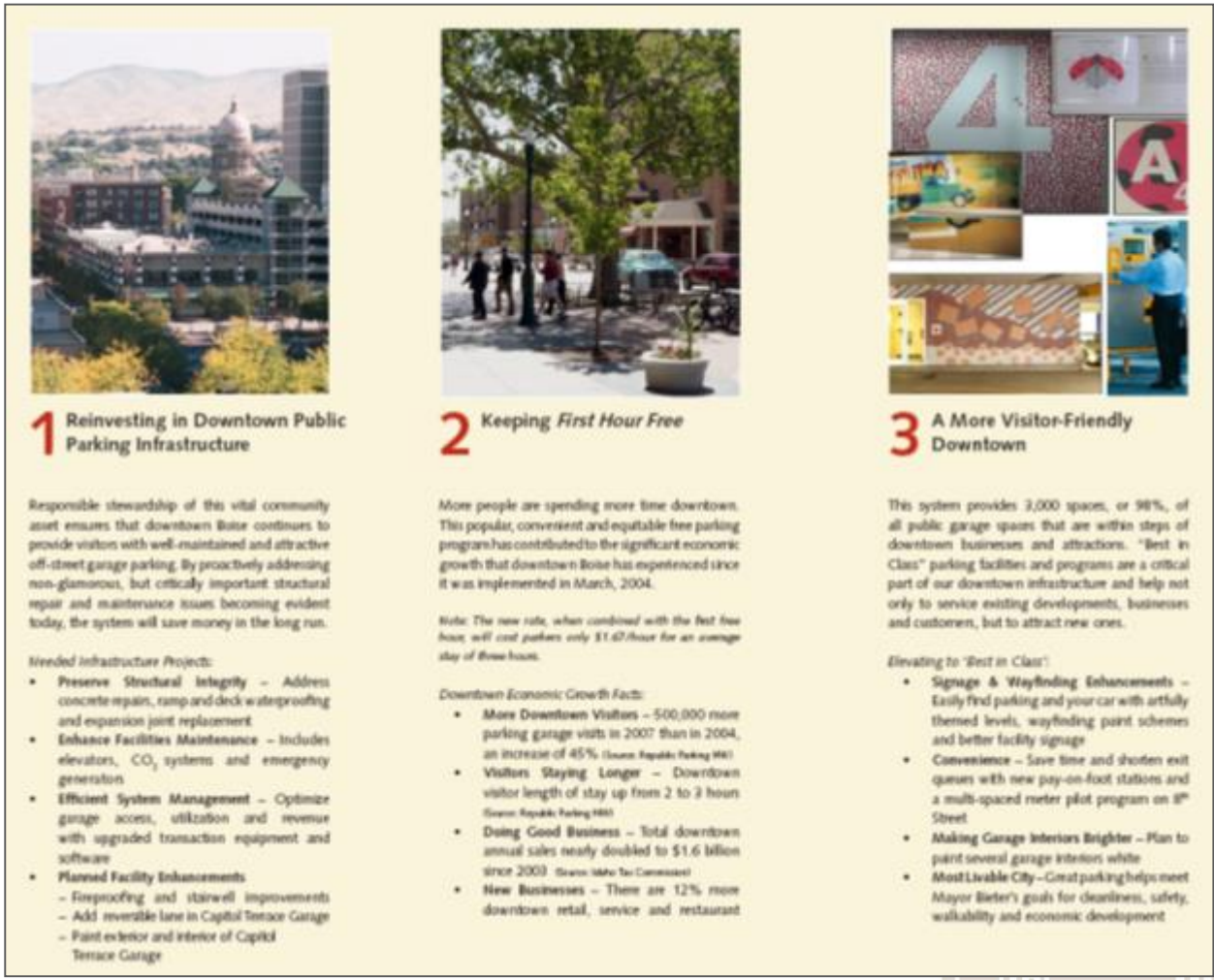
Implementation:

Communications

- Marketing Brochure
  - Keep it simple
  - 3 Key Points
  - Succinct and reinforcing secondary messages.



1 Reinvesting in Downtown Public Parking Infrastructure

Responsible stewardship of this vital community asset ensures that downtown Boise continues to provide visitors with well-maintained and attractive off-street garage parking. By proactively addressing non-glamorous, but critically important structural repair and maintenance issues becoming evident today, the system will save money in the long run.

Needed Infrastructure Projects:

- **Preserve Structural Integrity** – Address concrete repairs, ramp and deck waterproofing and expansion joint replacement
- **Enhance Facilities Maintenance** – Includes elevators, CO_2 systems and emergency generators
- **Efficient System Management** – Optimize garage access, utilization and revenue with upgraded transaction equipment and software
- **Planned Facility Enhancements**
  - Fireproofing and stairwell improvements
  - Add reversible lane in Capitol Terrace Garage
  - Paint exterior and interior of Capitol Terrace Garage

2 Keeping *First Hour Free*

More people are spending more time downtown. This popular, convenient and equitable free parking program has contributed to the significant economic growth that downtown Boise has experienced since it was implemented in March, 2004.

Note: The new rate, when combined with the first free hour, will cost parkers only $1.67/hour for an average stay of three hours.

Downtown Economic Growth Facts:

- **More Downtown Visitors** – 500,000 more parking garage visits in 2007 than in 2004, an increase of 45%
- **Visitors Staying Longer** – Downtown visitor length of stay up from 2 to 3 hours
- **Doing Good Business** – Total downtown annual sales nearly doubled to $1.6 billion since 2003
- **New Businesses** – There are 12% more downtown retail, service and restaurant

3 A More Visitor-Friendly Downtown

This system provides 3,000 spaces, or 98%, of all public garage spaces that are within steps of downtown businesses and attractions. "Best in Class" parking facilities and programs are a critical part of our downtown infrastructure and help not only to service existing developments, businesses and customers, but to attract new ones.

Elevating to 'Best in Class':

- **Signage & Wayfinding Enhancements** – Easily find parking and your car with artfully themed levels, wayfinding paint schemes and better facility signage
- **Convenience** – Save time and shorten exit queues with new pay-on-foot stations and a multi-spaced meter pilot program on 8th Street
- **Making Garage Interiors Brighter** – Plan to paint several garage interiors white
- **Most Livable City** – Great parking helps meet Mayor Bieter's goals for cleanliness, safety, walkability and economic development

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ASSESSMENT STRATEGIES

APPROVAL PROCESSES

- City Council Briefings
- Public Comment Period
- CCDC Board Approval

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City Council Briefings

- Courtesy Briefings
  - No Action Required by City Council
  - One-on-One or small group briefings
  - Information packet well received

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Public Comment Period

- Flyer distributed to all Downtown Businesses
- ✧ Also made available in all parking booths
- ✧ CCDC Board set May ’08 public hearing date in April, ‘08
  - Public Responses
  - Very limited (10 letters & emails during ensuing month)

CCDC Board Approval

- No opposition testimony
  - ✧ Unanimous adoption by 9 member board

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IMPLEMENTATION

- Changing the Rates
- Working the Plan
- Impact of the Recession
- Making Adjustments

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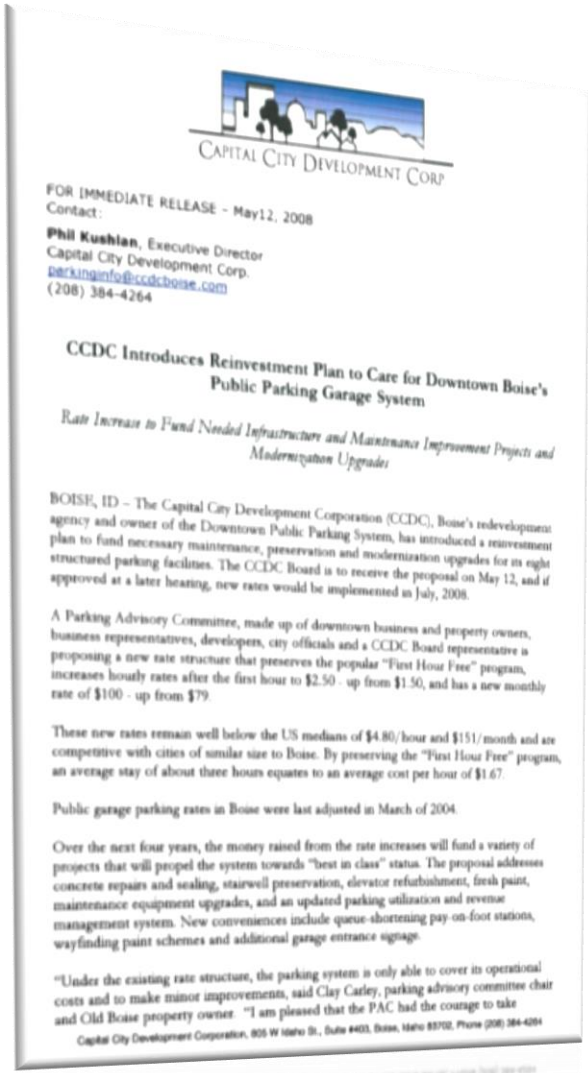
Implementation:

Communications



CAPITAL CITY DEVELOPMENT CORP

FOR IMMEDIATE RELEASE - May12, 2008
Contact:

Phil Kushlan, Executive Director
Capital City Development Corp.
parkinginfo@ccdcboise.com
(208) 384-4264

CCDC Introduces Reinvestment Plan to Care for Downtown Boise's Public Parking Garage System

Rate Increase to Fund Needed Infrastructure and Maintenance Improvement Projects and Modernization Upgrades

BOISE, ID – The Capital City Development Corporation (CCDC), Boise's redevelopment agency and owner of the Downtown Public Parking System, has introduced a reinvestment plan to fund necessary maintenance, preservation and modernization upgrades for its eight structured parking facilities. The CCDC Board is to receive the proposal on May 12, and if approved at a later hearing, new rates would be implemented in July, 2008.

A Parking Advisory Committee, made up of downtown business and property owners, business representatives, developers, city officials and a CCDC Board representative is proposing a new rate structure that preserves the popular "First Hour Free" program, increases hourly rates after the first hour to $2.50 - up from $1.50, and has a new monthly rate of $100 - up from $79.

These new rates remain well below the US medians of $4.80/hour and $151/month and are competitive with cities of similar size to Boise. By preserving the "First Hour Free" program, an average stay of about three hours equates to an average cost per hour of $1.67.

Public garage parking rates in Boise were last adjusted in March of 2004.

Over the next four years, the money raised from the rate increases will fund a variety of projects that will propel the system towards "best in class" status. The proposal addresses concrete repairs and sealing, stairwell preservation, elevator refurbishment, fresh paint, maintenance equipment upgrades, and an updated parking utilization and revenue management system. New conveniences include queue-shortening pay-on-foot stations, wayfinding paint schemes and additional garage entrance signage.

"Under the existing rate structure, the parking system is only able to cover its operational costs and to make minor improvements, said Clay Carley, parking advisory committee chair and Old Boise property owner. "I am pleased that the PAC had the courage to take

Capital City Development Corporation, 805 W Idaho St., Suite #403, Boise, Idaho 83702, Phone (208) 384-4264

- Timing is Important
  - ✧ Press Releases
  - ✧ Newspaper Articles

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Implementation:

"Working the Plan"

- Two modest projects in 2008
  - "My Space" devices in reserved spaces
  - Multi colored way finding paint scheme
- Financial Market Crash October 2008

Implementation:

"The Impact of the Recession/Making Adjustments"

- Impact of the Recession
  - Reduction in projected revenues for the parking reinvestment program ($250,000 vs. $1M expected)
- Adjust resources and priorities based on funds available.
  - Despite having to make adjustments, Good to have the "work plan"
  - Reprioritize projects and adjust spending levels
  - Stakeholder buy-in to process and plan important
  - When adjustments were necessary "no big out cry"

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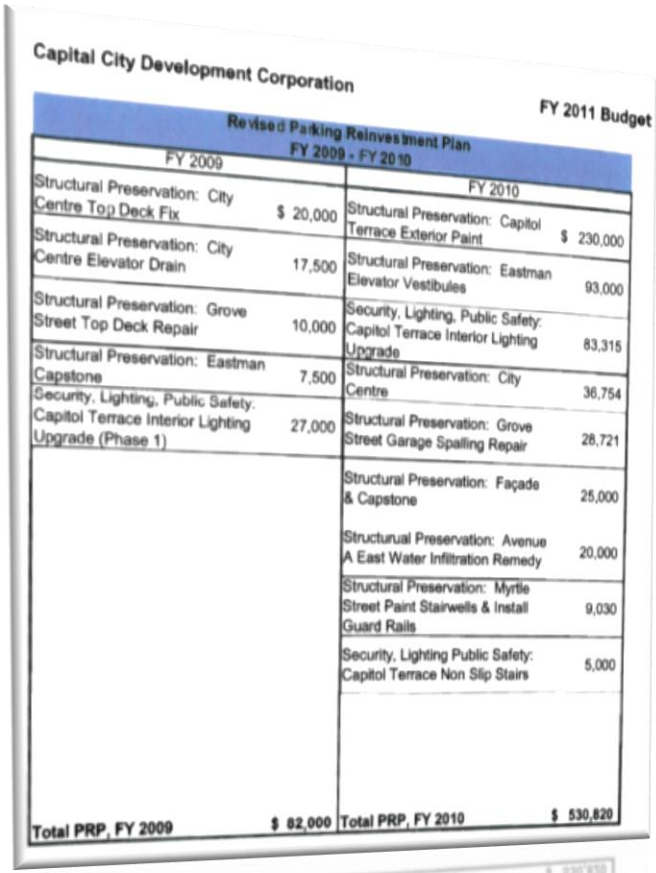
Implementation:

"Getting Back On Track"



Capital City Development Corporation

FY 2011 Budget

Revised Parking Reinvestment Plan
FY 2009 - FY 2010

FY 2009		FY 2010	
Structural Preservation: City Centre Top Deck Fix	$ 20,000	Structural Preservation: Capitol Terrace Exterior Paint	$ 230,000
Structural Preservation: City Centre Elevator Drain	17,500	Structural Preservation: Eastman Elevator Vestibules	93,000
Structural Preservation: Grove Street Top Deck Repair	10,000	Security, Lighting, Public Safety: Capitol Terrace Interior Lighting Upgrade	83,315
Structural Preservation: Eastman Capstone	7,500	Structural Preservation: City Centre	36,754
Security, Lighting, Public Safety: Capitol Terrace Interior Lighting Upgrade (Phase 1)	27,000	Structural Preservation: Grove Street Garage Spalling Repair	28,721
		Structural Preservation: Façade & Capstone	25,000
		Structurual Preservation: Avenue A East Water Infiltration Remedy	20,000
		Structural Preservation: Myrtle Street Paint Stairwells & Install Guard Rails	9,030
		Security, Lighting Public Safety: Capitol Terrace Non Slip Stairs	5,000
Total PRP, FY 2009	$ 82,000	Total PRP, FY 2010	$ 530,820

- Modest initial investments
  - ✧ Economy ended free fall
  - ✧ Agency debt restructured
  - ✧ Unloaded two unprofitable garages
  - ✧ Upside of down economy: no major investments, more $ to parking
- $750K expected over next few years

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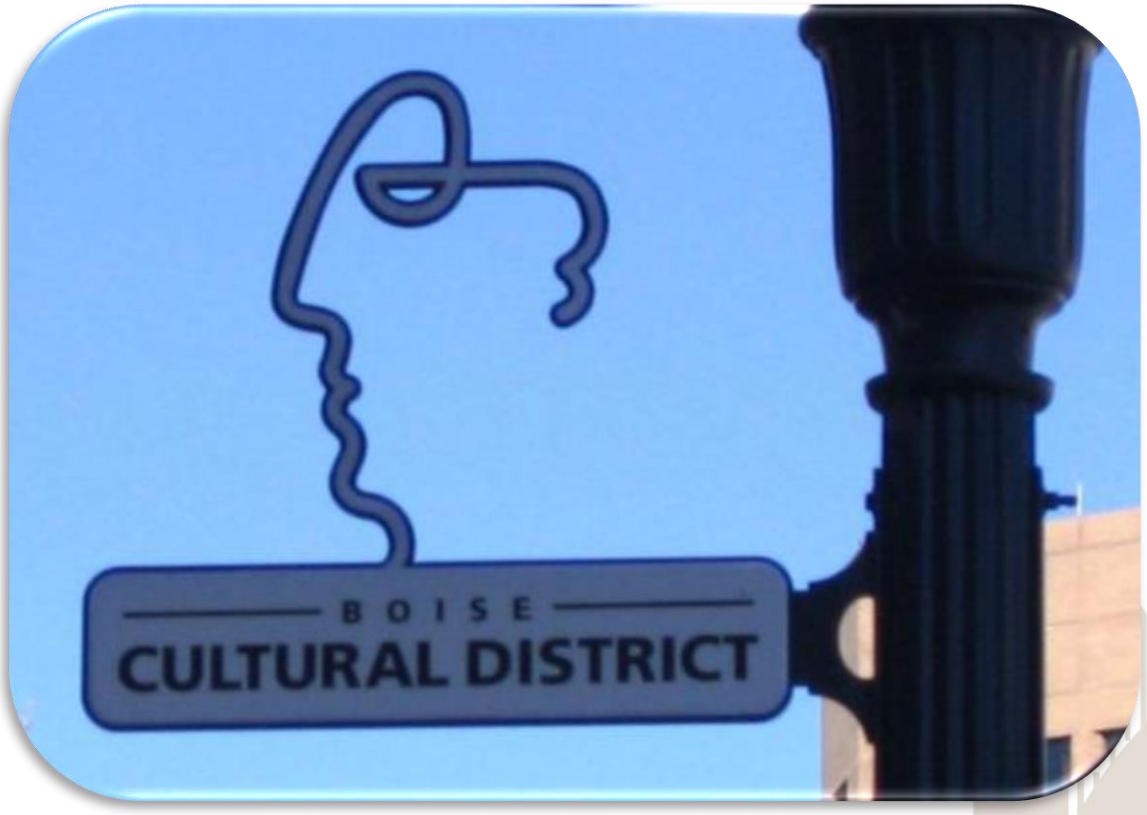
STRATEGIES

Q & A



Appendix 38

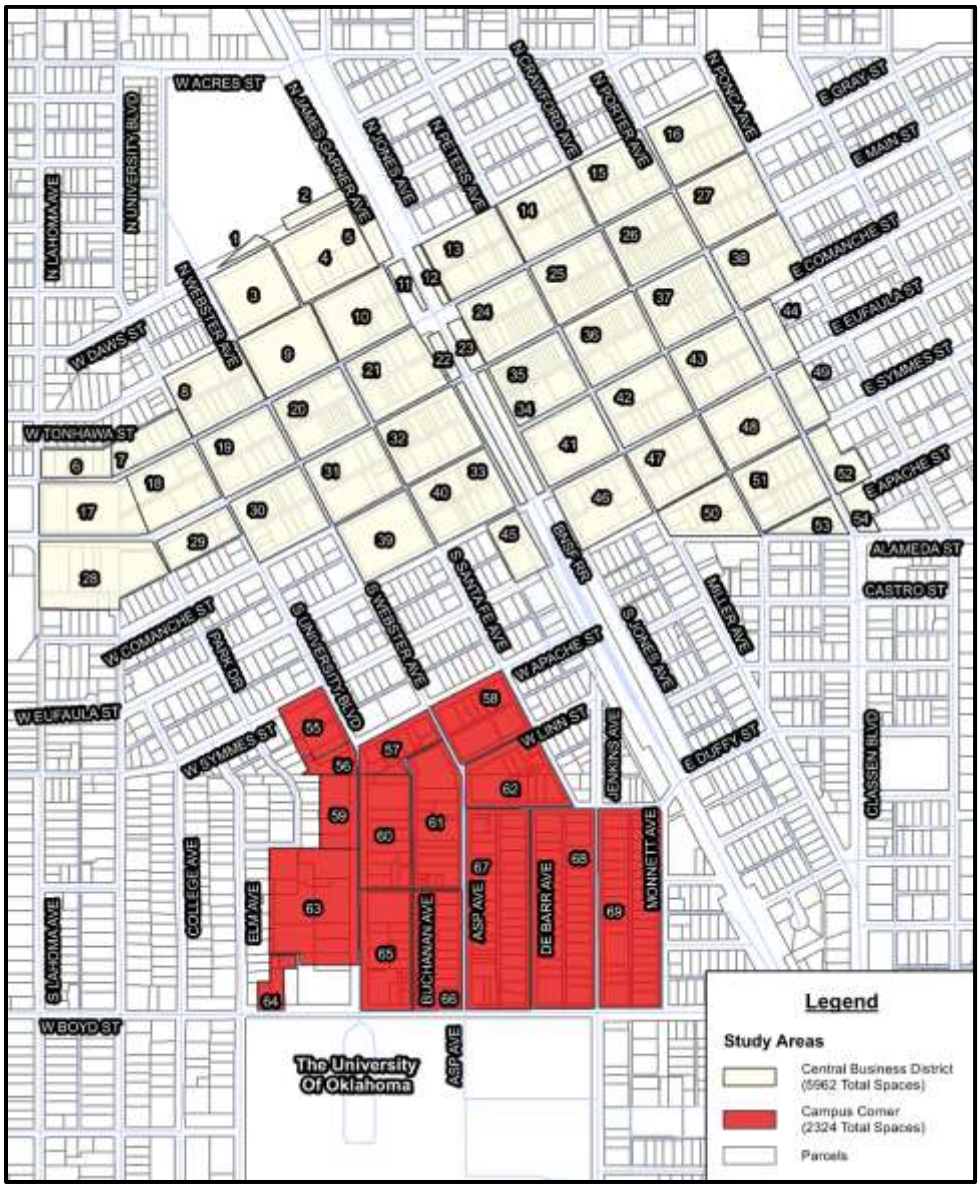
Limited Parking Supply/Demand Update

Data Tables

Limited Parking Supply/Demand Update – Data Tables

To better understand existing parking assets, usage patterns, and overall parking demand needs for Norman's core neighborhoods and downtown, Kimley-Horn coordinated with the County and City to identify the areas of focus for this report's data collection efforts. It was determined that the area which included downtown and the Campus Corner area was the primary area of focus for this effort (see Figure 1). Figure 1 also shows the numbered block system that was used to identify each city block in the data collection process.

Figure 1. Study Area



The following provides an overview of what was included in the parking supply/demand update analysis conducted by Kimley-Horn:

1. Parking inventory was collected by block for the entire study area.
2. Parking occupancy was collected by block for the entire study area.
3. Parking data was collected on weekday beginning at the peak hour identified in the Jacobs study at 10:00am.

This appendix provides detailed parking inventory and occupancy data by block.

- Table 1 provides updated parking inventory numbers for both on and off-street parking by block
- Table 2 provides updated on-street parking occupancy data by block
- Table 3 provides updated off-street parking occupancy data by block

Table 1. Parking Inventory by Block

Downtown Norman

Parking Inventory by Block

Block #	On-Street	Off-Street	Total
1	0	25	25
2	0	60	60
3	0	123	123
4	24	176	200
5	30	0	30
6	0	112	112
7	0	87	87
8	14	135	149
9	0	44	44
10	23	112	135
11	0	45	45
12	26	0	26
13	30	160	190
14	29	82	111
15	12	47	59
16	31	117	148
17	0	159	159
18	0	161	161
19	31	166	197
20	35	121	156
21	31	141	172

22	8	0	8
23	0	28	28
24	29	99	128
25	30	162	192
26	38	113	151
27	0	114	114
28	0	311	311
29	15	85	100
30	25	110	135
31	37	27	64
32	84	47	131
33	65	0	65
34	5	0	5
35	51	93	144
36	46	60	106
37	44	76	120
38	0	121	121
39	3	265	268
40	24	171	195
41	58	27	85
42	25	185	210
43	31	83	114
44	0	19	19
45	0	56	56
46	29	217	246
47	43	124	167
48	22	0	22
49	0	74	74
50	0	54	54
51	0	42	42
52	0	41	41
53	0	32	32
54	0	50	50
55	0	187	187
56	0	47	47
57	5	144	149
58	50	52	102
59	0	71	71
60	14	107	121

61	35	211	246
62	28	66	94
63	0	556	556
64	0	66	66
65	41	61	102
66	49	138	187
67	38	174	212
68	0	79	79
69	25	80	105
Total	1,313	6,998	8,311

Table 2. On-Street Occupancy by Block

Downtown Norman

On-Street Parking Occupancy by Block

Block #	Supply	Count	Occupancy
1	0	0	
2	0	0	
3	0	0	
4	24	8	33%
5	30	11	37%
6	0	0	
7	0	0	
8	14	7	50%
9	0	0	
10	23	11	48%
11	0	0	
12	26	5	19%
13	30	6	20%
14	29	15	52%
15	12	7	58%
16	31	3	10%
17	0	0	
18	0	0	
19	31	2	6%
20	35	12	34%
21	31	16	52%
22	8	1	13%

23	0	0	
24	29	14	48%
25	30	23	77%
26	38	17	45%
27	0	0	
28	0	0	
29	15	4	27%
30	25	5	20%
31	37	13	35%
32	84	23	27%
33	65	22	34%
34	5	3	60%
35	51	27	53%
36	46	33	72%
37	44	18	41%
38	0	0	
39	3	2	67%
40	24	1	4%
41	58	45	78%
42	25	13	52%
43	31	16	52%
44	0	0	
45	0	0	
46	29	12	41%
47	43	15	35%
48	22	20	91%
49	0	0	
50	0	0	
51	0	0	
52	0	0	
53	0	0	
54	0	0	
55	0	0	
56	0	0	
57	5	1	20%
58	50	30	60%
59	0	0	
60	14	10	71%
61	35	13	37%

62	28	27	96%
63	0	0	
64	0	0	
65	41	32	78%
66	49	38	78%
67	38	27	71%
68	0	0	
69	25	0	0%
Total	1,313	608	46%

Table 3. All Off-Street Parking by Block

Downtown Norman

Off-Street Parking Occupancy by Block

Block #	Supply	Count	Occupancy
1	25	9	36%
2	60	21	35%
3	123	69	56%
4	176	113	64%
5	0	11	
6	112	22	20%
7	87	28	32%
8	135	49	36%
9	44	15	34%
10	112	48	43%
11	45	8	18%
12	0	5	
13	160	46	29%
14	82	48	59%
15	47	25	53%
16	117	4	3%
17	159	64	40%
18	161	105	65%
19	166	100	60%
20	121	70	58%
21	141	59	42%
22	0	1	
23	28	24	86%
24	99	64	65%
25	162	45	28%
26	113	85	75%
27	114	39	34%
28	311	91	29%
29	85	31	36%
30	110	67	61%
31	27	20	74%
32	47	35	74%
33	0	22	

34	0	3	
35	93	101	109%
36	60	65	108%
37	76	56	74%
38	121	20	17%
39	265	17	6%
40	171	41	24%
41	27	64	237%
42	185	118	64%
43	83	60	72%
44	19	7	37%
45	56	17	30%
46	217	171	79%
47	124	64	52%
48	0	20	
49	74	19	26%
50	54	5	9%
51	42	22	52%
52	41	14	34%
53	32	11	34%
54	50	6	12%
55	187	185	99%
56	47	19	40%
57	144	109	76%
58	52	47	90%
59	71	39	55%
60	107	60	56%
61	211	121	57%
62	66	50	76%
63	556	404	73%
64	66	54	82%
65	61	77	126%
66	138	149	108%
67	174	87	50%
68	79	43	54%
69	80	50	63%
Total	6,998	3,838	55%

Parking Garage Start-Up Plan

Draft 04-2018
Appendix 39.

Garage Opening Team

Task	Task Owner	Deadline	Status
Identify garage opening team members			
Identify all stakeholders and their needs			
Determine team member roles and responsibilities			
Gather and assemble contact information for all team members			
Establish team meeting schedule and progress reporting process			
Conduct kick off meeting			
Establish plan timelines			
Identify potential issues and plans to avoid/resolve them			

Legal

Task	Task Owner	Deadline	Status
Draft parking contract and related agreements			
Contract signatures			

Operations

Task	Task Owner	Deadline	Status
Gather new facility information and complete internal paperwork needed by other departments			
Establish an organizational chart for the garage management team			
Present draft management plan to County for approval			
Develop hourly, monthly and special event parking rates and validation program details			
Document location inventory using the Location Inventory Template			
Order change fund internally, if needed			
Order signage, if needed			
Order uniforms			
Order tickets, if needed			
Order validation stickers, if needed			
Order monthly devices, if needed			
Order office and cleaning supplies, if needed			
Establish outside vendor relationships, as needed (security, armored car, maintenance, equipment, etc.)			
Order business cards			
Obtain forms			
Request utility record changes, if needed			
Establish initial location staffing schedule			
Set up amenity programs planned for the location			
Complete an initial rate survey of the area			
Create initial location marketing plan			
Establish initial meeting schedule with client contact			
Evaluate location revenue controls and policies and procedures			
Develop an action plan to address deficiencies related to previous row evaluation			

Payroll

Task	Task Owner	Deadline	Status
Determine how start dates and vacation accruals will be handled for employees transitioning from previous operator			
Determine employee pay schedules			
Identify location payroll contact			
Provide this person payroll training if new to company or role			
Apply for payroll account #'s, if applicable			
Apply for Workers Comp Insurance, if applicable			
Apply for reduced Unemployment Insurance rate, if applicable			
Obtain new hire payroll paperwork from all employees			
Set location up in the payroll system			
Set employees up in the payroll system			
Create employee files			
Set up vacation accruals and start dates for employees transitioning from previous operator, as applicable			
Identify first pay date			
Identify check distribution procedure, point of contact and destination			
Coordinate set up of GL codes with Accounting, as applicable			

Human Resources

Task	Task Owner	Deadline	Status
Determine whether a union is in place at the location or in this area of the company			
Review current CBA, where applicable and prepare for terms within agreement			
Develop location organizational chart, as needed			
Determine recruiting needs - positions, quantity, timeline			
Create a recruitment strategy			
Execute recruitment strategy			
Prepare new employee offer letters			
Prepare new hire paperwork packets for all new employees			
Provide employee handbook copies			
Prepare and provide benefit packages for new employees			
Organize employee information collection events with new employees			
Conduct employee information collection events with new employees			
Identify any transitioning employee issues - workers compensation, short term disability, long term disability, grievances and			

Training

Task	Task Owner	Deadline	Status
Determine training needs at location			
Customize new hire orientation and training materials, as needed			
Organize new hire orientation and training sessions for new employees			
Conduct new hire orientation and training sessions			

Communications

Task	Task Owner	Deadline	Status
Establish internal communications plan (message to existing employees)			
Carry out internal communications plan			
Establish external communications plan (message to existing clients, press release)			
Obtain client approval for external plan			
Carry out external communications plan			

Accounting

Task	Task Owner	Deadline	Status
Set up location in accounting systems			
Open bank account or assign location to existing bank account			
Open merchant account for credit card processing and obtain POS equipment, if needed			
Develop client reporting package for monthly statements			
Identify client reporting deadlines and requirements			
Determine letter of credit and/or surety bond requirements			

Monthly Parking

Task	Task Owner	Deadline	Status
Set location up in billing system			
Obtain customer information and set up in billing system			
Determine if accounts receivable balances will be added to billing and update customer records accordingly.			
Set up un-issued device inventories in the billing system			
Complete initial month of monthly invoice billing			

Audit

Task	Task Owner	Deadline	Status
Establish initial location audit schedule			
Set up mystery shopper program, if applicable			

IT

Task	Task Owner	Deadline	Status
Determine what IT services are needed at location			
Order hardware and software, if needed			
Set up new employee user profiles			

Draft Parking Program Preliminary
Project Budget Outline
Apr-18
Appendix 40

The goal of this preliminary parking program budget outline is to give a high-level estimation of potential parking program revenues and expenses with the additon of the proposed County Garage.

			Estimated Parking Revenues 2020
REVENUES	**Assumptions**		
Parking Garage Revenue			
- Monthly/Contract Parking	$50/space/month - Covered Parking (200 spaces) Assumed 80% utilization	$	96,000.00
	$30/space/month - Uncovered (90 spaces) Assumed 80% utilization	$	25,920.00
- Transient/Hourly Parking	$2.00 minimum (2 hours) (100 hourly spaces) Assumed 70% utilization x average fee of $3.00 for 250 days per year	$	52,500.00
- Validation Program	Recommended "First-Hour Free" program in the garage		($30,000)
Parking Lot Revenue	Based on current on-street parking revenues provided by the City with a 5% escalation factor Note: Parking is currently free on weekends and holidays	$	56,123.00
	Sub-Total Garage Revenues:	$	200,543.00
On-Street Meter Revenue	On-street meter revenues (including Whoosh! and Validation Codes)	$	25,000.00
On-Street Meter Permits		$	20,000.00
Special Event Parking Revenue	Assumes free parking for events	$	-
Parking Enforcement Revenue	Based on parking citation recievables report from July 2016 - Aug 2017	$	12,000.00
	Total Operating Revenue	**$**	**257,543.00**
EXPENSES			
Gross Wages	Parking Adminstrator Salary ($60K) and 4 FTEs of parking staff from parking management firm - including a parking manager($190K)	$	250,000.00
Grounds Maintenance	Assumes only parking garage and 1st and Gray Street Lot	$	3,500.00
Total Insurance	Based on similar programs	$	10,000.00
Management Fees	Assumes engagement of a private parking management firm	$	55,000.00
Payroll Taxes	Based on similar programs	$	3,829.00
On-Street Meter Supplies	Based on similar programs	$	7,500.00
Postage and Delivery	Based on similar programs	$	300.00
Printing and Reproduction	Based on similar programs	$	500.00
Bank Service Charges	Based on similar programs	$	100.00
Total Professional Fees	Based on similar programs	$	6,500.00
Staff Development and Training	Based on similar programs	$	6,000.00
Security	Based on similar programs	$	8,500.00
Signage	Based on similar programs	$	2,500.00
Total Supplies	Based on similar programs	$	5,100.00
Total Utilities	Based on similar programs	$	36,000.00
	Total Operating Expenses	**$**	**395,329.00**
	Net Results:	$	(137,786.00)

Appendix 40

Recommended On-Street Meter Upgrade and Expansion Program and Revenue Projection

Appendix 40: Recommended On-Street Meter Upgrade and Expansion Program and Revenue Projection

Stakeholder feedback on the current parking meter program included suggestions to upgrade all of the current parking meters to match the upgraded meters already introduced in the Campus Corner area. We agree with this recommendation and recommend the consideration of adding up to approximately 200 additional meters over the next several years.

Based on a preliminary budget estimate of the future parking program that includes the proposed County parking garage (See Appendix 40), the parking program would generate revenues of approximately $257,543.00 and expenses estimated at approximately $395,329.00 for a net result of approximately -$137,786.00.

The primary value of metered parking is to promote the turn-over of valuable on-street spaces as short-term parking resources to support the business that need this source of convenient and accessible customer parking. The addition of approximately 200 additional parking meters would generate approximately $275,000.00 in additional parking program revenues. This addition of parking program revenues would put the proposed parking program "in the black" financially in the second or third year of operations with a projected positive net result of approximately $137,214.00. See the preliminary on-street meter projection model on the following page.

Cleveland County / City of Norman

Preliminary On-Street Meter Revenue Projection Model

$1.00 per Hour Rate

Factors	Variables / Assumptions	Description
Enter number of metered spaces:	200	Number of on-street spaces within the "Downtown Business District" area.
Enter # of hrs/day …….:	9	Assumes meters enforced 9am to 6 pm. Change to fit enforcement hours/days.
Enter # of days per week……..:	5	Assumes Monday through Friday. Saturday is usually a separate calculation since utilization is different.
# of weeks per year meters paid :	51	Allows up to 7 holidays that meters are not enforced per year.
Enter the hourly rate in $ per hour:	$ 1.00	The amount charged per hour in dollars or decimal portion thereof.
Utilization factor …….:	0.6	A decimal portion between 0 and 1 that indicates the usage of the aggregate meter spaces. High levels of usage will be 0.85 to 1.0, low levels would be 0.10 to 0.35. 0.60 indicates our estimate of near-term meter utilization.
Projected Annual Meter Revenue:	**$ 275,400**	
		NOTES:
		It is recommended that meters be grouped into areas of similar usage. These groups should also be used to define collection routes or groups. Tracking revenue and comparing actual to projected will help define changes to the utilization factor so that revenue forcasts can be as accurate as possible.
		Please be aware that evening and weekend utilization will be different than weekday factors. A revenue projection for a single group of meters may require 2 or 3 calculations to arrive at an accurate revenue projection for all time frames.
Number of controlled spaces	200	Number of on-street spaces within the "Downtown Business District" area.
Number of spaces controlled/device:	200	Assumes using the same meters currently in use in the Campus Corners area
Number of meter mechanisms:	200	Assumes single space units
Cost of each mechanism:	$ 850	$850 per meter (includes meter mechanism, housing, pole and installation)
Projected Equipment Capital Cost:	**$ 170,000**	Total projected capital equipment cost.
Projected Year One Net Revenue	**$ (105,400)**	Projected year one net revenue after deduction of capital cost, installation and training.
Projected Year Two Net Revenue	**$ 275,400.00**	Projected year two net revenue after system capital cost, installation and training have been paid. NOTE: Does not include parking program staffing/operations costs.

Varible Inputs - Changed values will update totals.

Appendix 42

Developing a Retail Parking Support Strategy

Appendix 42

Developing a Retail Parking Support Strategy

The provision of short-term, retail supportive parking is a key issue to encourage and strengthen the resurgence of downtown Norman. Specific strategies and approaches are outlined below.

Characteristics of Effective Retail Parking

Revitalizing retail in a downtown setting is one of the most difficult elements of downtown revitalization to get right. Convenient, plentiful and easily accessible parking is especially critical to the success of retail in a downtown area.

What is often overlooked or underestimated in retail revitalization projects is a comprehensive "retail parking strategy". In many cases this will involve significant investment in new parking infrastructure or at least a restructuring or reallocation of existing parking resources. Once the parking supply issues have been addressed, a wide range of parking management strategies should also be considered.

Taking a comprehensive approach to downtown retail parking is important because of the significant differences in the downtown environment compared to "the competition" i.e., suburban malls or the big box store approach. The suburban malls and big box stores have several obvious advantages over downtowns.

- Plentiful land on which to provide cheap (perceived as free) surface parking
- Simple, easily understood access characterized by direct line of sight from the parking lot to the store(s)
- Generally high levels of service as expressed through short walking distances, more generous parking stall widths, etc.
- Single ownership/control and dedicated parking resources
- More ability to control employee parking behaviors through direct management

Downtowns have, in recent years, seen unparalleled success in their revitalization efforts. It is interesting to note that this success has not gone unnoticed by the shopping center industry. They have adapted their strategies to stay competitive. There is only one enclosed (now considered "old style") mall under construction in the US this year. The new trend for shopping centers is "Life Style Centers". These new shopping destinations emulate the character and features of "genuine downtowns" or "main streets". They often have all the amenities of downtowns and few of the "warts". The worst that can be said of them is that they lack that ineffable quality that comes with time, history and the diversity of a real downtown. They may feel inauthentic and "cookie cutterish". However, they usually have plentiful, well located and (very often) free parking.

While we can rarely start with a "clean slate" in downtown environments when it comes to parking, there are some basic principles relative to effective retail parking strategies that can be employed to give retail a fighting chance in the downtown. The key elements of a downtown retail parking strategy are outlined below:

I. **On-street Parking** – As the most conveniently located parking assets (and therefore the most valuable), effective management of on-street parking is critical. This generally includes:

- On-street parking being prioritized for short-term, visitor parking.
- On-street parking being priced higher than off-street parking.
- Having an effective and consistent parking enforcement function – the primary goal of which is to enforce the rules designed to promote on-street space turnover.
- Having an effective combination of time-limits to support the specific uses on downtown retailers. For example, coffee shops and dry cleaners have different needs than restaurants and clothing stores.
- The use of easy to read/color-coded time-limit stickers on meters is a simple but important tool that lets drivers know the time-limit of an on-street space before pulling in to park.
- Having an effective downtown loading zone plan to support retail deliveries.
- Implementing a fine structure for on-street parking that is more forgiving to the occasional violator and more aggressive toward the real problem – repeat long-term parkers taking up what should be short-term parking.
- Defining a well-developed legislative framework that supports enforcement practices (such as having a local ordinance that requires vehicles to move more than 1 block face after moving from one time-limited space to another.)
- The use of new parking enforcement technologies to improve the efficiency and effectiveness of enforcement efforts, such as computerized parking enforcement hardware and software programs and mobile license plate recognition systems with GPS capability.
- Consistent but unpredictable parking enforcement routes.
- A combination of on-street parking rates, fines and enforcement that ultimately promotes a consistent 15% vacancy rate for on-street spaces. Having a 15% on-street vacancy rate is considered important because it makes the downtown area appear to be more accessible and encourages potential customers to stop and shop if they see a well-designed storefront that appeals to them.
- In combination with the strategy above, providing signage about the availability of off-street retail parking is also important so that customers feel they have choices.
- The use of new on-street parking meter technologies that provide more customer-friendly payment options (this can either be multi-space meter or new single space meters that accept credit or debit cards) is becoming a primary strategy for downtowns. This has been aided by technological advances that incorporate wireless communications and solar power to reduce system installation costs.

II. **Off-street Parking** – In a downtown environment the primary issues related to retail parking are to provide large, easy-to-find reservoirs of parking within close proximity to the retail cores or corridors. Small pockets of off-street parking may be useful for those who frequent the downtown area, but these resources are not adequate to effectively support a successful retail “hot spot”. Specific issues for retail parking include:

- As much as practical, retail parking reservoirs should be located within line-of-sight of the retail anchors and very convenient to the contiguous retail corridors.
- The street level of retail parking structures should be designed to maintain the street-level activation of the area by incorporation retail into the at-grade level. To support this primary design criterion, higher first floor heights should be planned.
- To the greatest degree practical, designing for a higher parking facility level of service of "user comfort factor" is recommended. Creation of a defined set of parking garage design criteria with higher levels of service for short-term retail is recommended. These design criteria include such items as more generous parking bay and stall width dimensions, end-bay turn radii, floor-to-floor heights, enhanced lighting, etc.
- For a parking facility that is specifically designed to support a retail patronage, "user comfort factors" of A or B are recommended (high ease of use standards).
- Direct connections from the retail parking structure to a retail anchor (via sky bridge, for example) are desirable features.
- The perception of safety and security is critically important for a retail parking facility. Recommended design strategies for improving parking facility security include: glass-backed stair and elevator towers, adopting enhanced lighting levels (in excess of IES minimum requirements), painting interiors white to improve lighting reflectivity and enhancing the feeling of openness, securing the areas beneath stairwells, etc.
- Effective wayfinding and facility signage is essential. Parking signage should be a significant element of a comprehensive wayfinding program. As we do a better job of architecturally incorporating parking into mixed-use facilities, sometimes we "hide the parking" too well. Because of this, enhanced parking facility entrance signage is also very important.
- Other interior facility enhancements such as creative level-theming concepts, interior wayfinding and level identification signage can also help make garages more colorful, visually interesting and aid patrons by making it easier to remember where they parked. This approach can also be used to connect with other community groups – for example some communities engage local artists by using garage level theming projects as art competitions. Similar projects include turning bike racks and bus stops into opportunities for community art.

III. **Overall Parking Management** - From a management and operations perspective, there are many effective strategies that downtown parking programs can employ to better support the larger community's strategic goals. Parking programs too often become focused on parking facility revenues or enforcement quotas to justify their programs. The best programs are those with a broader perspective and that align their policies to help the communities they serve achieve success. Often, by doing this, they achieve an even higher level of success themselves – both in terms of stimulating additional traffic (and therefore parking revenue) and also by becoming a valued and integral partner in the success of the downtown. The following is a short-list of strategies to frame the possibilities:

- Programs such as a "First Hour Free" for off-street public parking facilities can make downtown appear more visitor friendly while providing both a more equitable program and simplifying the administration of traditional parking validation programs. While we support programs such as "First Hour Free" as an element of a larger downtown revitalization initiative, we recognize that paid parking in a downtown environment is a basic economic reality. We support the philosophy that "Parking should be friendly – not free". In one community where the "First Hour Free" program was enacted, parking rates were reassessed after four years. The downtown stakeholders were given a choice of no rate increase, but elimination of the "First Hour Free" program and they unequivocally wanted to keep the "First Hour Free". This intrigued us enough to do some more research. It turned out that in the four years the "First Hour Free" had been in effect, downtown sale tax revenues had doubled and the average parking transient length of stay had grown from 2.11 hours to 3.56 hours. Not all of this is direct attributable to the "First Hour Free" program, but the downtown merchants credited the program as one of the key elements to the revitalization of the downtown.
- Another positive trend in the industry is the reinvestment of a portion of on-street and enforcement parking revenues back into the districts from which they were generated. This reinvestment can take the form of financial contributions to downtown organizations to promote the marketing of the district, investment in specific district projects such as wayfinding projects, area wide Wi-Fi, flower basket programs, pop jet fountains, banner programs, etc. This reinvestment makes the districts more attractive and customer friendly and therefore more successful. It also makes the local merchants more tolerant of needed paid parking and enforcement programs, because they see the benefits of not only the increased on-street space turnover, but also tangible downtown improvements that their customers appreciate.
- In off-street retail parking facilities, the lower levels (or more accurately, the most convenient parking areas) should be reserved for retail customer use. Employees or other groups should be assigned to park in other areas of the facility. Depending on the facility design, enforcement of these allocation strategies can often be enhanced through the use of what is termed "nested parking areas" using access control gates and card readers.
- Improving the training and customer service of frontline parking employees can have a huge effect because of all the individual "touches" parking staff make with the public on a daily basis. Training parking staff (cashiers, maintenance and enforcement staff) to adopt the role of "downtown ambassadors" rather than just parking attendants is a key attitude shift that should be actively promoted.
- Painting the interior of parking facilities and adding color (either through level theming graphics or even advertisements) can enhance parking facility interior environments and make facilities feel brighter and safer. Generally speaking, parking facilities have been treated as very utilitarian structures – at best they were dull, grey and functional. At worst, they were dark, scary and dangerous. Investment in parking facility interior facility enhancements is part of making downtowns a more interesting and attractive destination.

- The use of newer technologies and more customer friendly parking access and revenue control systems can reduce wait times upon exiting and improve customer service by providing more convenient customer payment options.
- These days there is a both a “real world” and a “virtual program identity” on-line. Enhancing parking websites with effective tools such as interactive parking maps, on-line payment options, parking rate, special events and other information is expected these days. An important “best practice” in this area is a website that provides a comprehensive overview of downtown including retail and restaurant offering, cultural and special event venues and of course parking and transportation info. The best websites have an overall map of the downtown with the ability to turn on each of the elements above as a “map overlay”.
- Leveraging all of these program enhancements into a recognizable parking “Program Brand” can make people associate all the program enhancements with the public parking facilities and therefore they are more comfortable with downtown parking. Some communities even have radio ads promoting their parking system. In some communities, the public parking programs have made such noticeable strides forward that all the private parking operations were forced to also raise the standards of their operations. We call this the “high tide raises all boats” phenomenon.

Appendix 42

Draft Resolution to Create a Parking Management District

Draft of Municipal Code Chapter Authorizing the Creation of a Parking Improvement District

Note: It is intended that this document be used as a starting point for the development of a resolution to authorize the creation of a Parking Improvement District. Consultation with appropriate legal council will be required to investigate Oklahoma statutes regarding the creation of parking management agencies and if desired, the creation of special tax assessment districts.

Cleveland County/City of Norman, OK

Chapter No. ___ PARKING DISTRICT

Section ___.010 Purpose.

Section ___.020 Resolution of intention.

Section ___.030 Public hearing.

Section ___.040 Description of the area.

Section ___.050 Businesses subject to amendment.

Section ___.060 System of assessments or charges imposed.

Section ___.070 Parking and business improvement area established.

Section ___.080 Uses of revenues.

Section ___.090 Delegation of administration.

Section ___.100 Findings of benefit.

Section ___.120 Operative date.

Section ____.010 Purpose.

The purpose of this chapter is to authorize Cleveland County and the City of Norman, OK to jointly create a quasi-independent parking improvement district to improve the management of County and City parking resources and to support the economic development and the strategic vision of the County/City. The parking district will have the power to manage public parking assets, set parking rates, establish fines and other fees related to parking resources use such proceeds for the benefit of businesses within such area by doing any or all of the following:

A. Parking supply additions
B. Parking system improvements
C. Parking technology upgrades
D. Parking rate assessment and modifications
E. Beautification
F. Promotion of public events
G. Furnishing of art to public places in the area, and
H. General promotion of business activities.

Section ____.020 Resolution of intention.

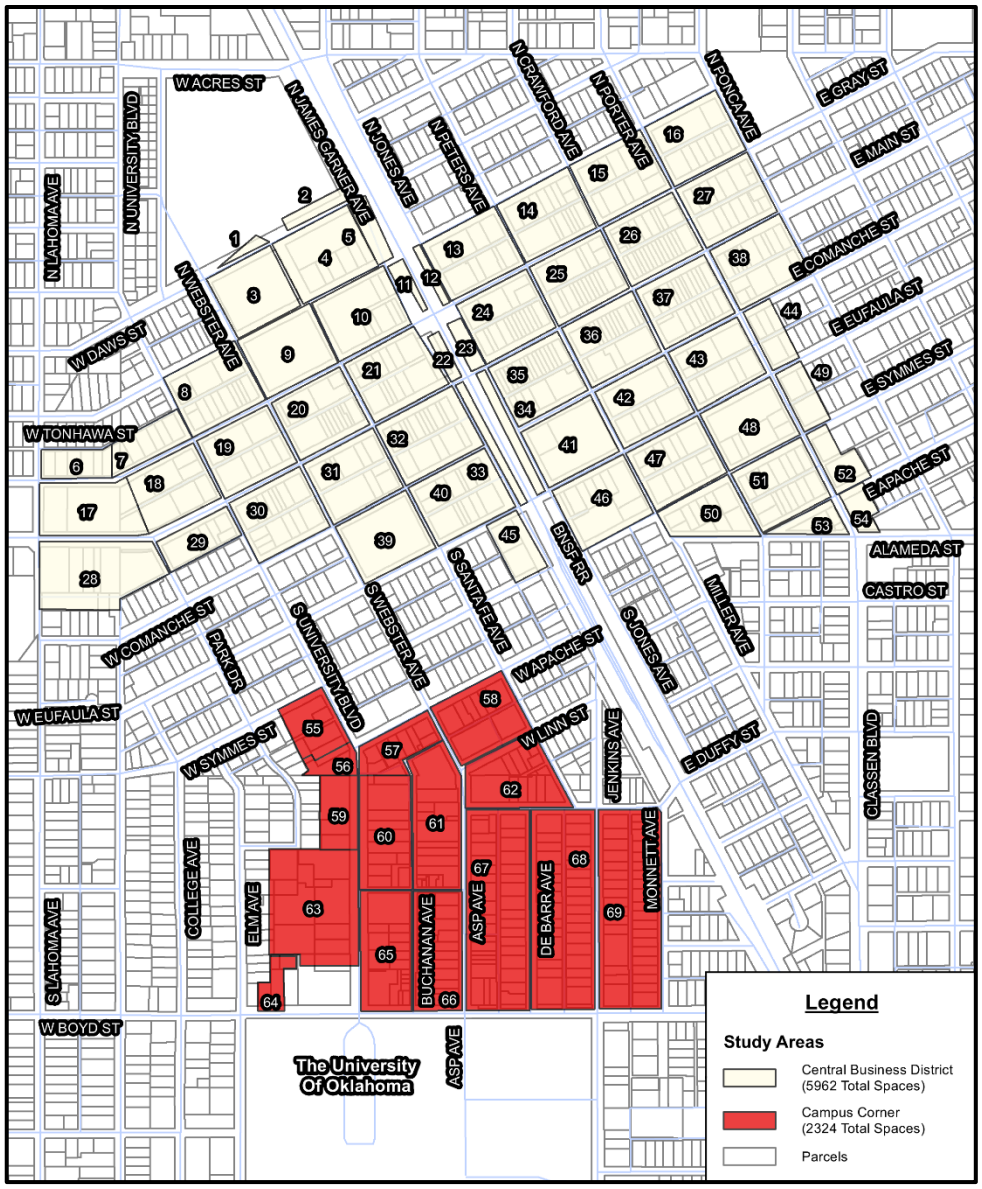
The parking district herein created was initiated pursuant to the provisions of the _____ Code Section _____ which requires adoption of a Resolution of Intention by the legislative body of any County/City creating such an entity. The Cleveland County Commission and the City Council of the City of Norman adopted Resolution No. _____ which declared their joint intention to consider establishment of a parking district.

Section ____.030 Public hearing.

Pursuant to the requirement of _____ Code Section _____, the Cleveland County Commission and the City Council of the City of Norman held a public hearing on (date/location) for the purpose of receiving testimony and protests and other comment from those businesses within the proposed area, and to receive any other information concerning the formation of the parking District.

Section ____.040 Description of the area.

The Parking District created herein is focused initially on the downtown business district and the "Campus Corner" area of the City of Norman, but may extend to cover parking management issues citywide in the future as additional needs develop. The downtown parking improvement district created herein is in the downtown business district area of Norman, an area outlined in the map below and permanently placed on file in the offices of the County/City Clerks, and incorporated herein by this reference. The boundaries of the downtown parking improvement district may be adjusted from time to time, by amendment to this resolution.



Section ____.050 Businesses subject to amendment. (Optional – not recommended at this time)

All businesses in the parking improvement district created and established under this chapter shall be subject to any amendments to this chapter enacted or adopted by the Cleveland County Commission and the City Council of the City of Norman.

Section ____.060 System of assessments or charges imposed. (Optional – not recommended at this time)

The Parking District will have the ability to implement a charge system to be imposed on each business entity within the parking improvement district as hereby created. Businesses shall pay an amount equal to ___ percent of the business tax charge as set forth in this code or as it may hereafter be amended. Such funds are in addition to and shall be kept in a separate account from business tax revenues and shall be used for the purposes that are established herein. (Ord. _____, 20__)

Note: the two sections above are typically used if a special taxing or assessment district is being incorporated into the Parking District. We are not recommending this component.

Section ____.070 Parking District established.

Pursuant to the provisions of this resolution, the Cleveland County Commission and the City Council of the City of Norman City Council hereby establishes a downtown parking district as described herein.

Section 3.46.080 Uses of revenues.

The revenues derived from the parking facilities and parking district charges shall be used for the following purposes:

A. Creation and operation of the Parking District
B. Parking Operations and Management
C. Parking System Capital Improvement
D. Parking System Marketing and Support of Seasonal Promotions
E. Beautification and Parking Projects
F. General promotion of business activities
G. Other uses not inconsistent with the purposes enumerated in Section _____. (Ord. _____, 20__)

Section 3.46.090 Delegation of administration.

The Cleveland County/City of Norman City Parking District is authorized to administer funds raised hereunder and to operate programs and activities which are consistent with the purposes, goals and uses outlined in this resolution and to formally report back to the County Commission and City Council at least annually beginning no later than January, ____. (Ord. _____, 20__)

Section 3.46.100 Findings of benefit.

The County Commission and City Council, after holding a public hearing and providing an opportunity for protests to be heard and after taking testimony and comment from interested persons representing businesses within the area, does hereby find that to promote improved public service, enhanced downtown economic development and the achievement of the County's and City's strategic goals, the creation of the parking district will be a valuable asset and that the businesses

conducting their activities within the area will benefit by the expenditure of funds raised by the charges as contemplated by this resolution.

Section 3.46.120 Operative date.

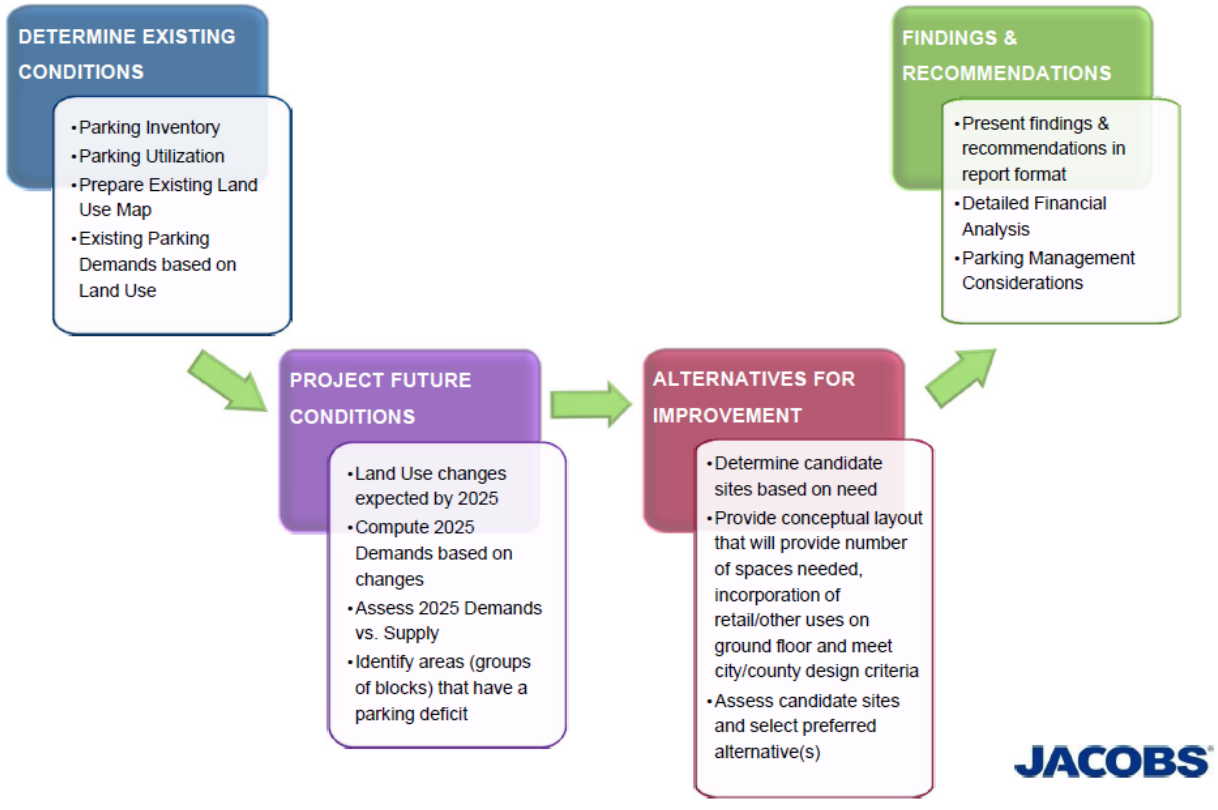
The operative date of this chapter is _____, 20__. (Ord. _____, 20__)

2016 Jacobs Parking Study Summary

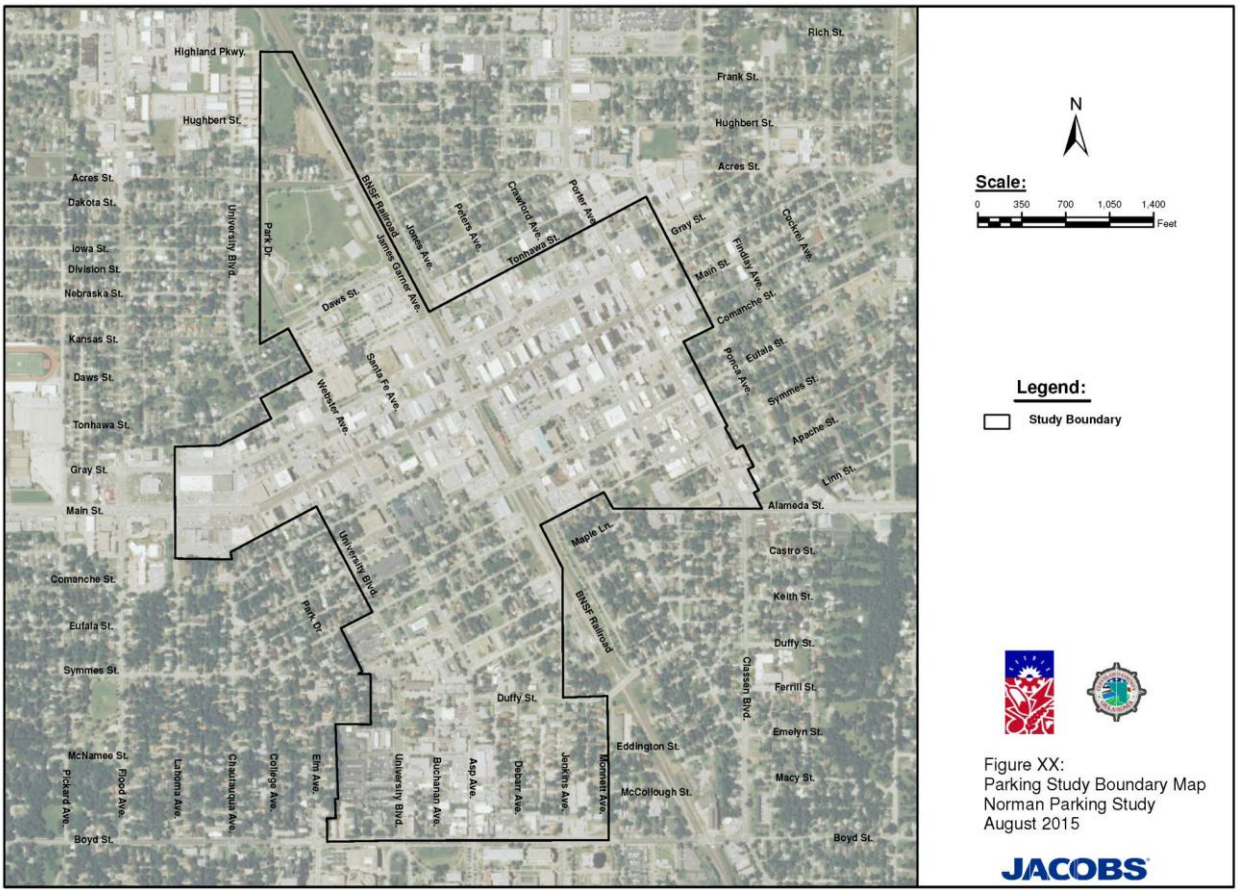
The stated purposes of the 2016 City of Norman parking study were to:

- Study current and future parking needs in downtown Norman and the Campus Corner area and to provide recommendations for improvements.
- Document the current parking inventory, including how many spaces are available and of what types (on-street free, on-street metered, off-street public/private, etc.).
- Document current utilization & demand (How many existing parking spaces are utilized at different blocks on a peak day, and how does utilization vary throughout the day? What do industry standards indicate the anticipated demand for a given land use will be versus what was observed in the field?) Evaluate demand versus supply.
- Project future parking demand. Adjust the current parking generation/inventory model to account for changes in future conditions expected within the next ten years (2025 planning horizon).
- Recommendations: Based on the parking supply/demand assessment results, recommend specific alternatives to address identified parking issues including property availability/costs, identify potential locations for parking system investments.

The general project approach was summarized in the graphic below:



Overall Study Area



Inventory and Study Emphasis Areas

The study area included in the 2016 collection represents approximately 0.26% of the City of Norman and approximately 0.09% of Cleveland County. The City of Norman, however, does represent approximately 49.5% of the County's population. The 2016 Study Area is shown in **Figure 1** below with a summary of parking types by location for each of the Central Business District (CBD) and Campus Corner areas in **Figure 2 and Figure 3**, respectively. Of the off-street parking facilities included below, Cleveland County owns property in Blocks 35, 40, 41 and 46.

Figure 1. Study Emphasis Areas

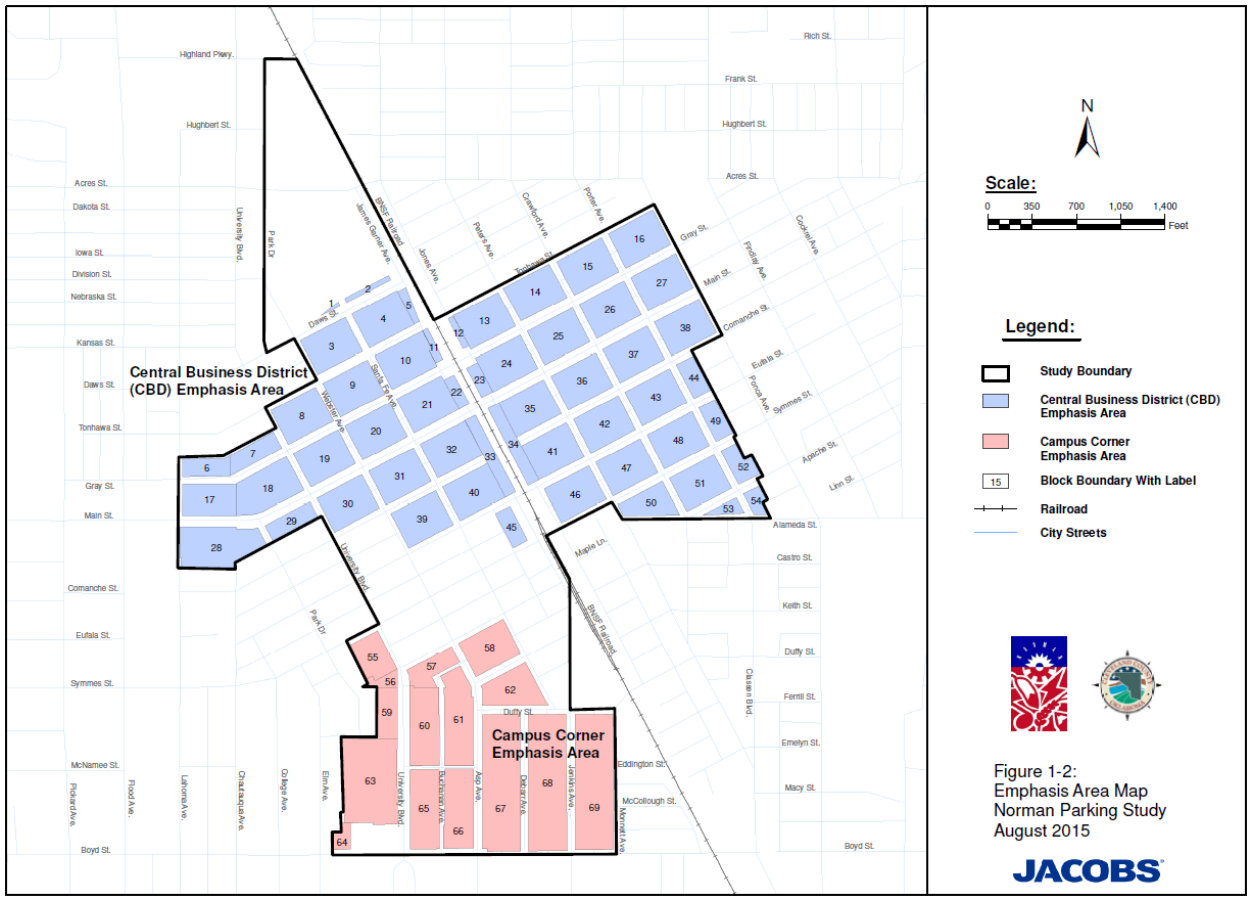


Figure 2. Total CBD Inventory

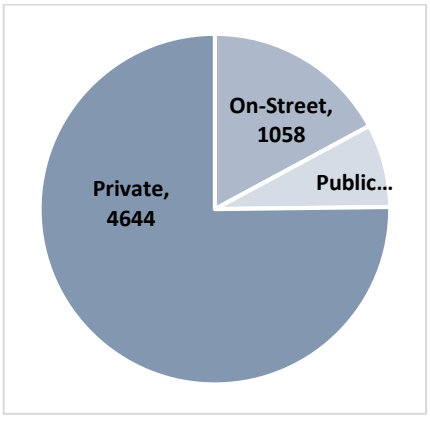
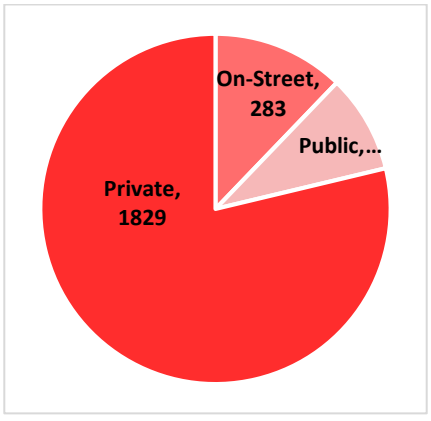


Figure 3. Campus Corner District Inventory



Parking Surplus/Deficit by Block Summaries

In assessing the current parking demand condtions, the following methodology was used by the Jacobs team. This approach complies with standard industry parking analysis techniques.

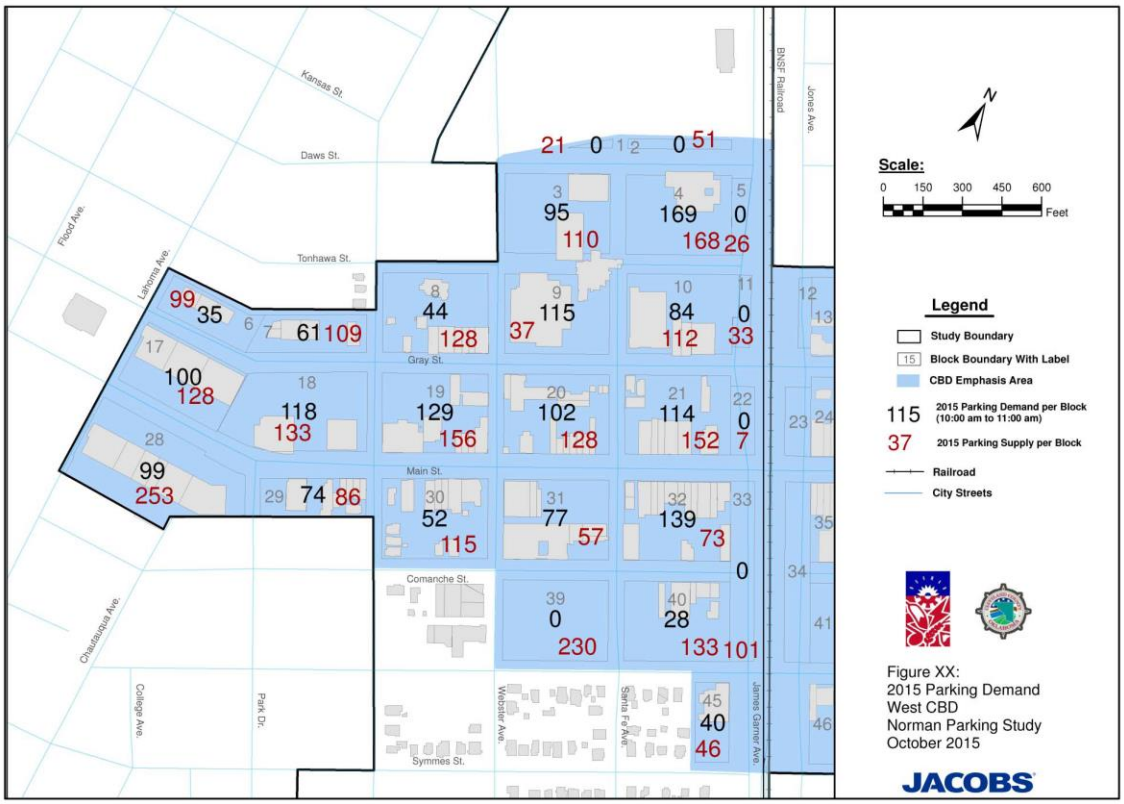
1. Apply weighted average parking generation rates based on land use type and gross floor area for each block.

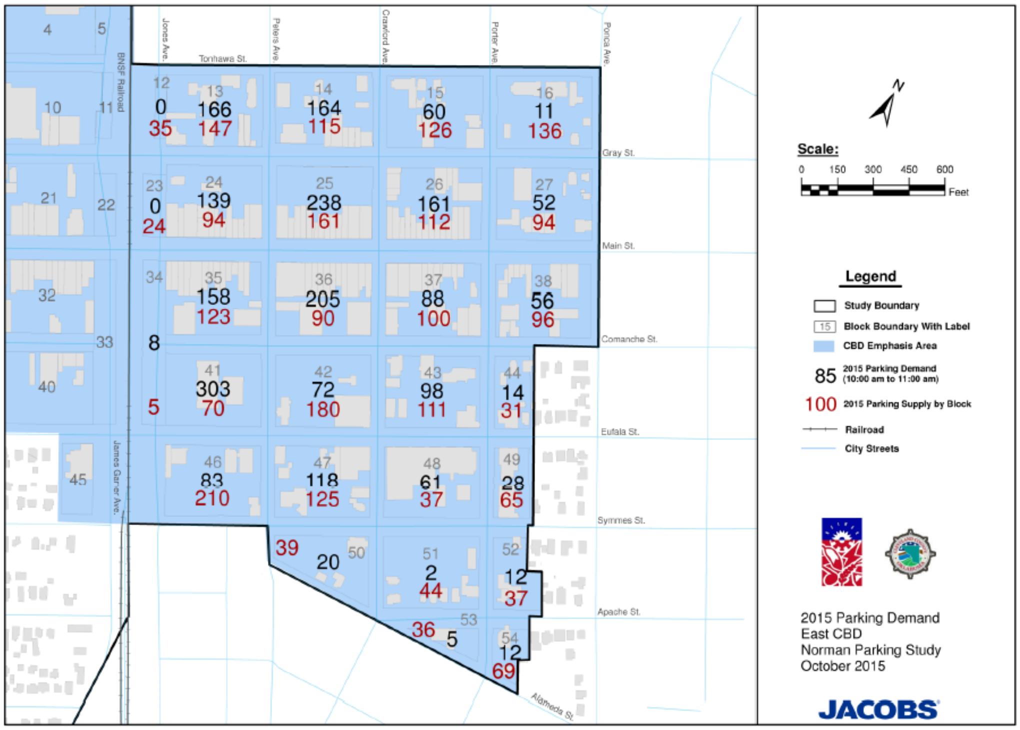
2. Adjust raw parking generation rates based on time-of-day, modal adjustments, building occupancy differences, and captive market factor.

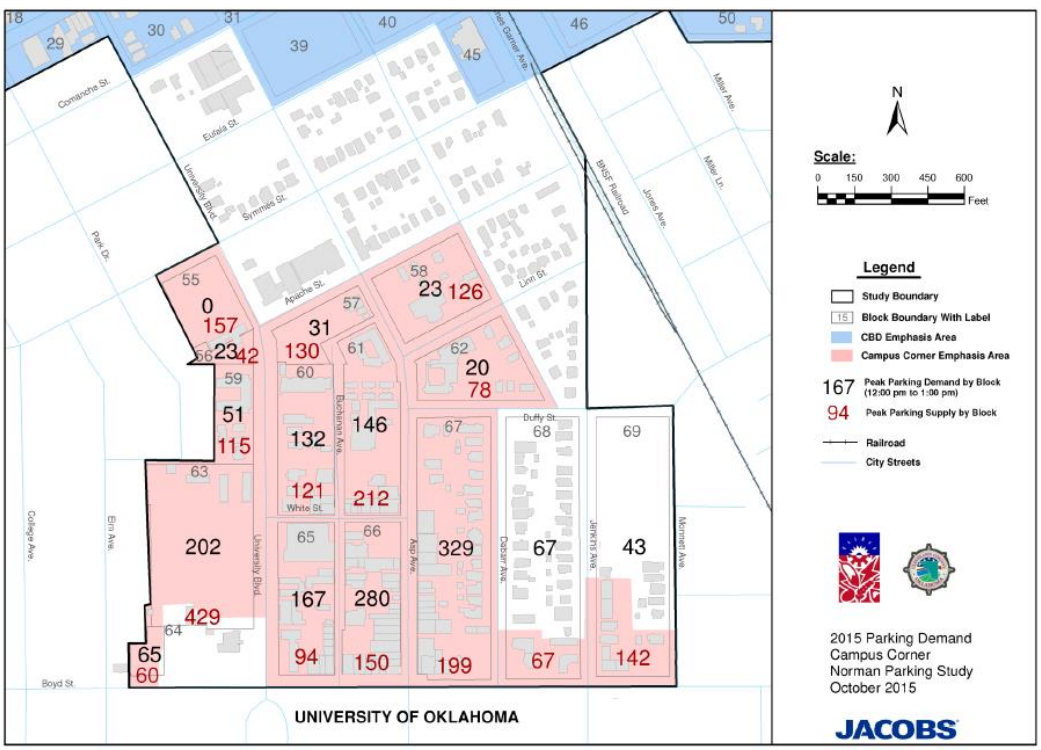
3. Compute total adjusted parking demand per block.

4. Compare parking demand versus effective parking supply.

The following graphics summarize the supply/demand conditions on a per block basis for the primary "emphasis areas" of the study.




Tonhawa St.
Jones Ave.
Peters Ave.
Crawford Ave.
Porter Ave.
Ponca Ave.
BNSF Railroad
Gray St.
Main St.
Comanche St.
Eufala St.
Symmes St.
Apache St.
Alameda St.
James Garner Ave.
Scale:
0 150 300 450 600
Feet
Legend
Study Boundary
Block Boundary With Label
CBD Emphasis Area
85 2015 Parking Demand (10:00 am to 11:00 am)
100 2015 Parking Supply by Block
Railroad
City Streets
2015 Parking Demand
East CBD
Norman Parking Study
October 2015
JACOBS


Comanche St.
Eufala St.
Symmes St.
Apache St.
Linn St.
University Blvd.
Park Dr.
BNSF Railroad
Jones Ave.
Miller Ave.
Miller Ln.
Buchanan Ave.
Asp Ave.
Debarr Ave.
Jenkins Ave.
Monnett Ave.
College Ave.
Elm Ave.
Boyd St.
White St.
Duffy St.
UNIVERSITY OF OKLAHOMA
N
Scale:
0 150 300 450 600
Feet
Legend
Study Boundary
Block Boundary With Label
CBD Emphasis Area
Campus Corner Emphasis Area
167 Peak Parking Demand by Block (12:00 pm to 1:00 pm)
94 Peak Parking Supply by Block
Railroad
City Streets
2015 Parking Demand
Campus Corner
Norman Parking Study
October 2015
JACOBS

2025 Parking Demand – Land Use Changes

In projecting future parking conditions, the following approach was used related to land use changes:

- Compute 2025 Demands based on changes
- Assess 2025 Demands vs. Supply
- Identify areas (groups of blocks) that have a parking deficit

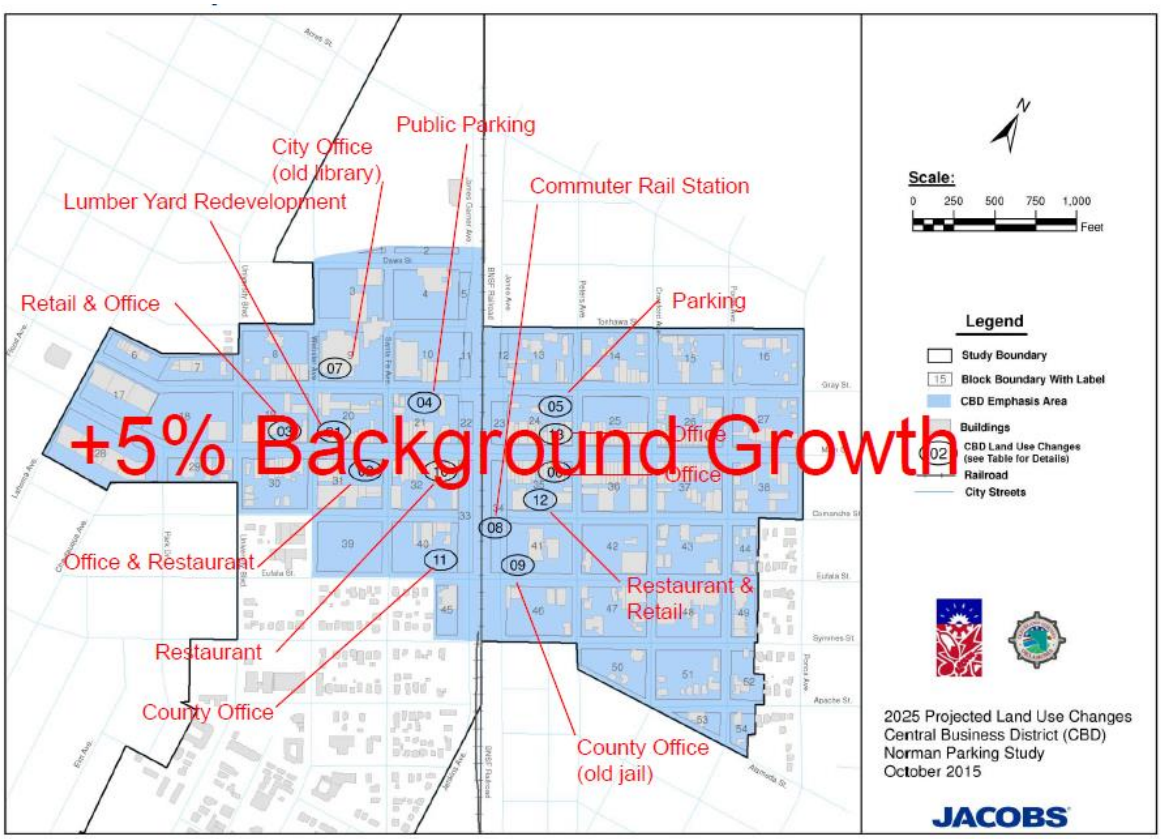
The table below summarizes the projected land use changes in the CBD emphasis area of the study:

Projected 2025 Land Use Changes in CBD

	LAND USE	DESCRIPTION
01	Retail; Multi-Unit Residential	Redevelopment of old lumber yard with retail on first floor and two additional floors of apartments.
02	Office; Restaurant	+5,000 S.F. GFA Office; +2,500 S.F. GFA Restaurant
03	Retail; Office	+5,000 S.F. GFA Retail; +3,000 S.F. Office
04	Public Parking	+40 Surface Parking Spaces open to the public.
05	Private Parking	+15 Surface Parking Spaces added to bank lot.
06	Office	10-story, +50,000 S.F. GFA Office Development.
07	Government Office; Office	Assume City/Office uses fill in after public library is constructed on James Garner Ave.
08	Commuter Rail (park and ride; TOD)	Commuter Rail Corridor Station added. Could potentially occur by 2025. 150 park & ride spaces needed.
09	Government Office	County Office Growth +20,000 S.F. GFA at old jail site.
10	Restaurant	+6,000 S.F. GFA Restaurant.
11	Government Office	County Office Growth +25,000 S.F. GFA. -87 Parking Spaces.
12	Restaurant/Retail	+10,000 S.F. GFA Restaurants and +14,500 S.F. GFA Retail on ground floor of parking structure. -16,137 S.F. GFA Bank. -16,251 S.F. GFA Government Office. -64 Surface Parking Spaces. +590 Structured Parking Spaces.
13	Office	+15,000 S.F. Office.

Sources: Project Steering Committee, CBD Stakeholder's Meeting.

The graphic below identifies locations of specific development activities as well as an assumption of an overall 5% "background growth" for this area.



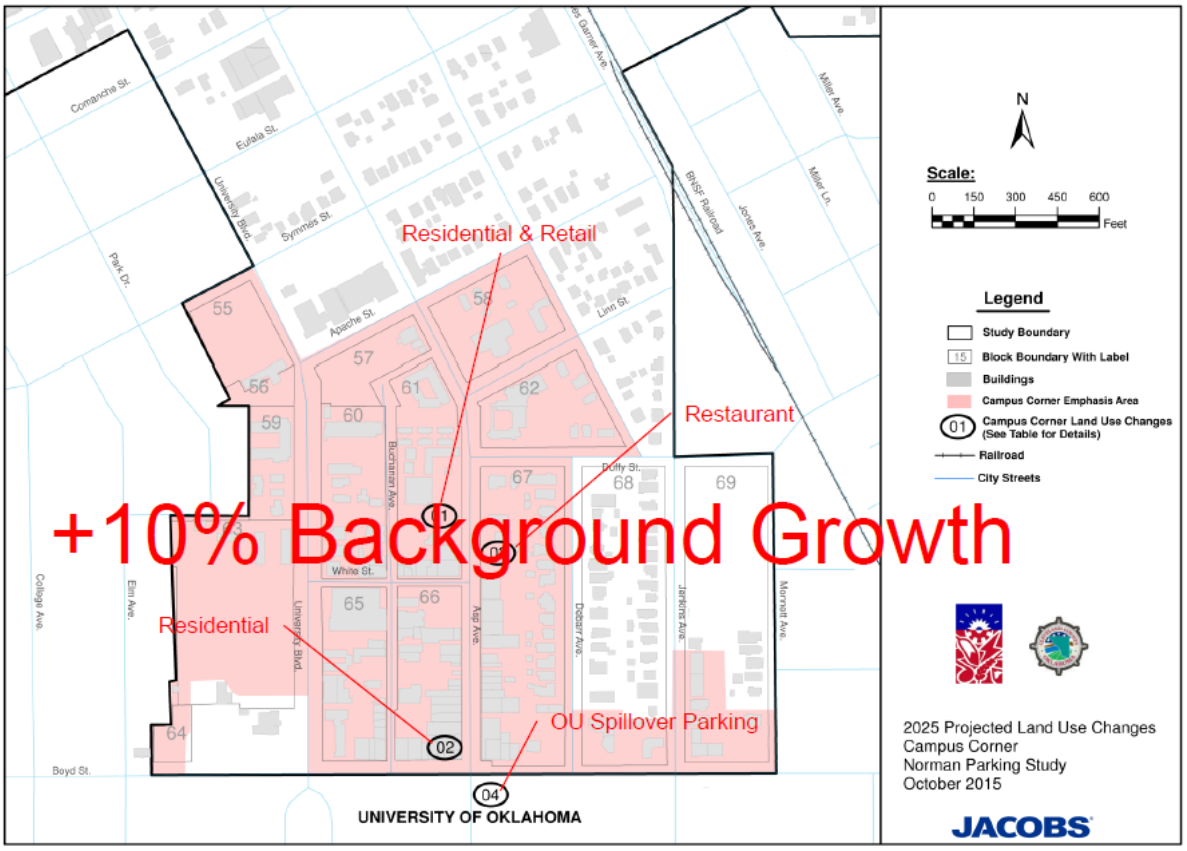
The table below summarizes the projected land use changes in the Campus Corner emphasis area of the study:

Table XX: Projected 2025 Land Use Changes in Campus Corner

	LAND USE	DESCRIPTION
01	Retail; Multi-Unit Residential	+40,000 S.F. GFA Apartment Building. +64 Dwelling Units.
02	Multi-Unit Residential	+40,000 S.F. GFA Apartments. +64 Dwelling Units.
03	Restaurants	+10,000 S.F. GFA Restaurants.
04	University of Oklahoma	+140 Additional Parking Demand related to OU campus spillover parking in Campus Corner area.

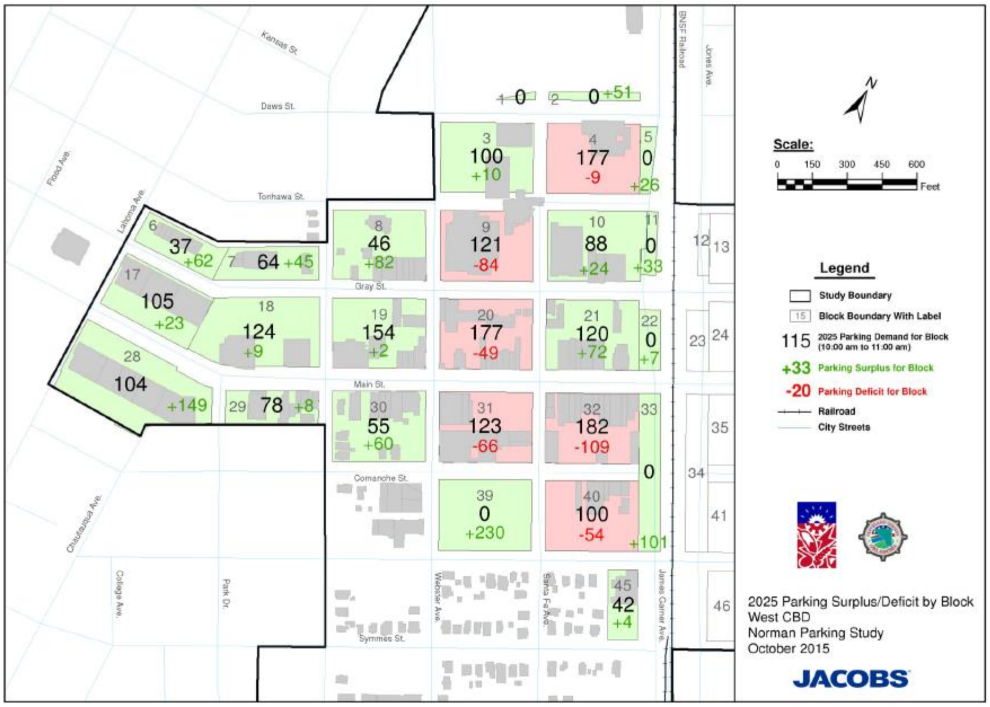
Sources: Project Steering Committee, Campus Corner Stakeholder's Meeting.

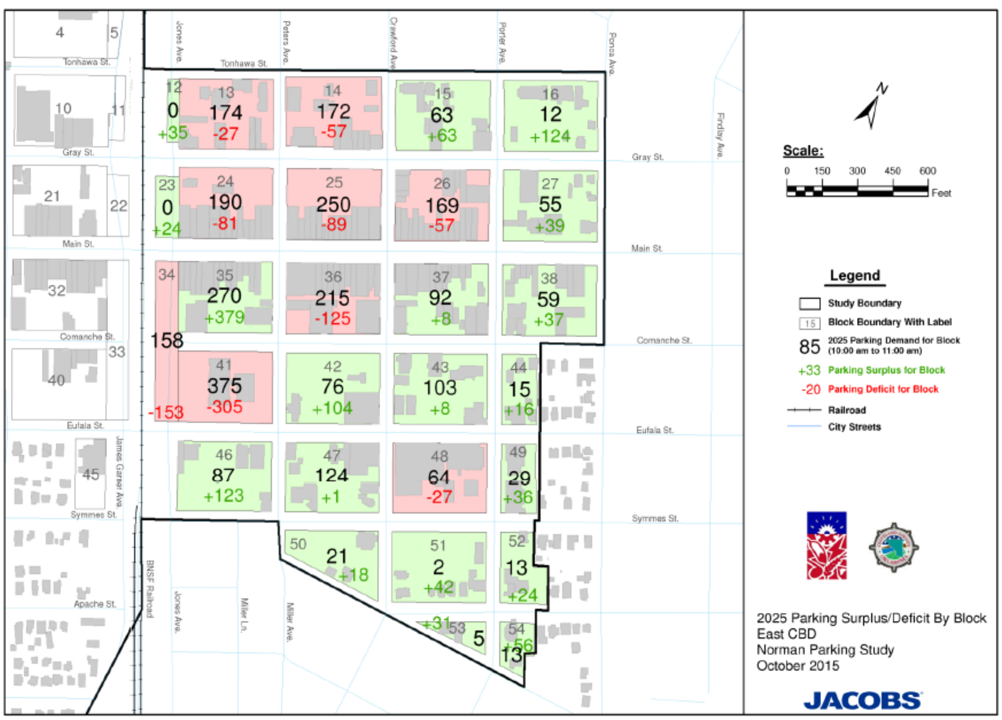
The graphic below identifies locations of specific development activities as well as an assumption of an overall 10% "background growth" for this area.

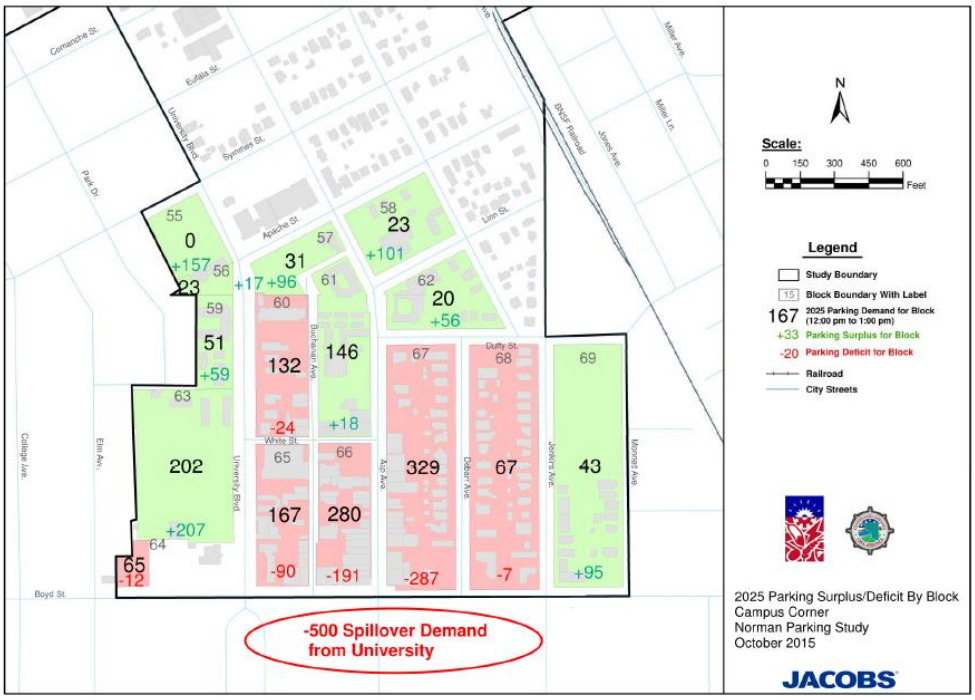


2025 Parking Demand – Projected Surplus/Deficit condtions

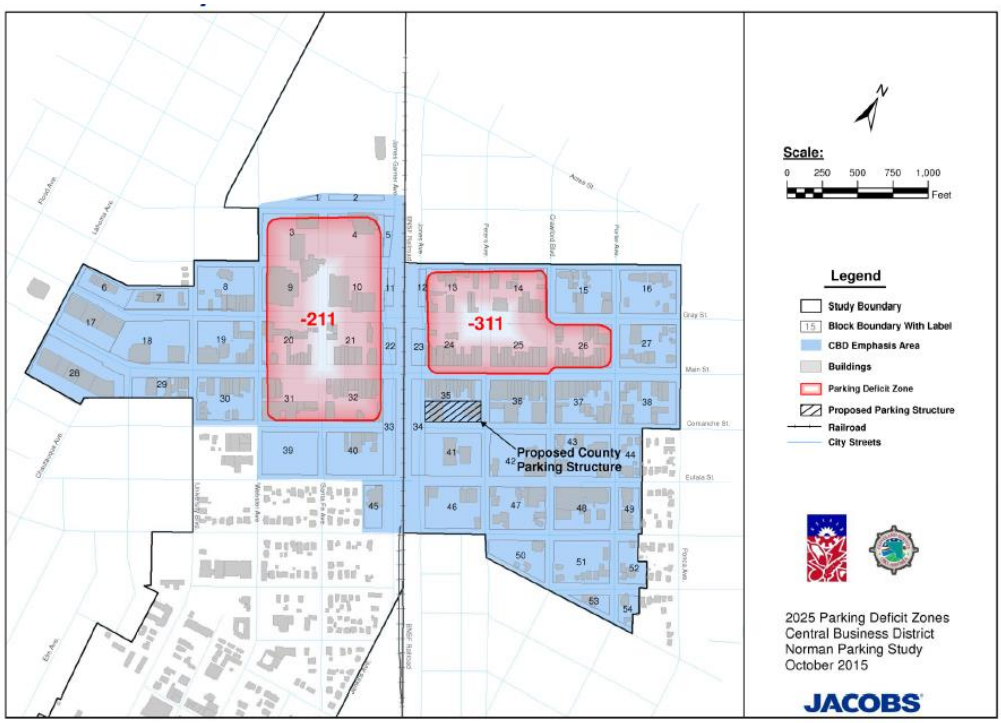
In comparing these future demand projections with supply conditions, the following graphics represent estimated parking surplus/deficit conditions by block in the year 2025 (planning horizon timeframe):

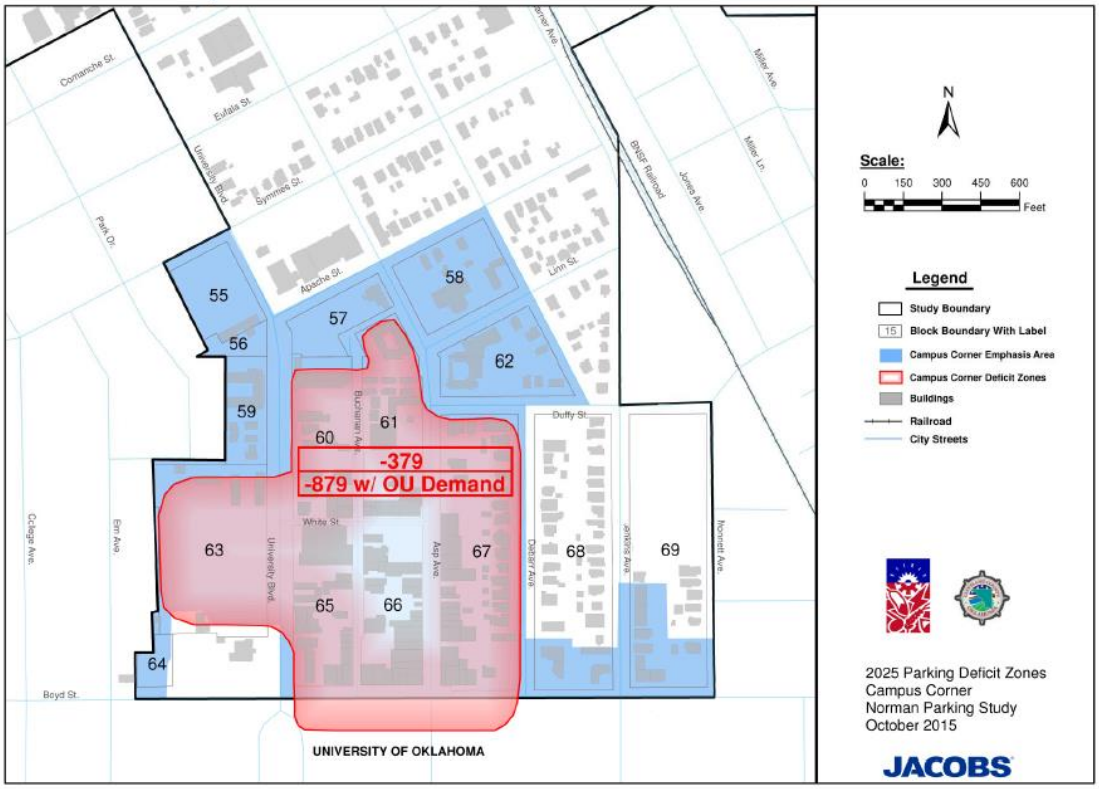

Scale:
0 150 300 450 600
Feet
Legend
Study Boundary
Block Boundary With Label
115 2025 Parking Demand for Block (10:00 am to 11:00 am)
+33 Parking Surplus for Block
-20 Parking Deficit for Block
Railroad
City Streets
2025 Parking Surplus/Deficit by Block
West CBD
Norman Parking Study
October 2015
JACOBS


Scale:
0 150 300 450 600
Feet
Legend
Study Boundary
Block Boundary With Label
85 2025 Parking Demand for Block (10:00 am to 11:00 am)
+33 Parking Surplus for Block
-20 Parking Deficit for Block
Railroad
City Streets
2025 Parking Surplus/Deficit By Block
East CBD
Norman Parking Study
October 2015
JACOBS



Per the Jacobs methodology, the next step in their process was to "identify areas (groups of blocks) that have parking deficit conditions. These areas are illustrated in the following graphics.



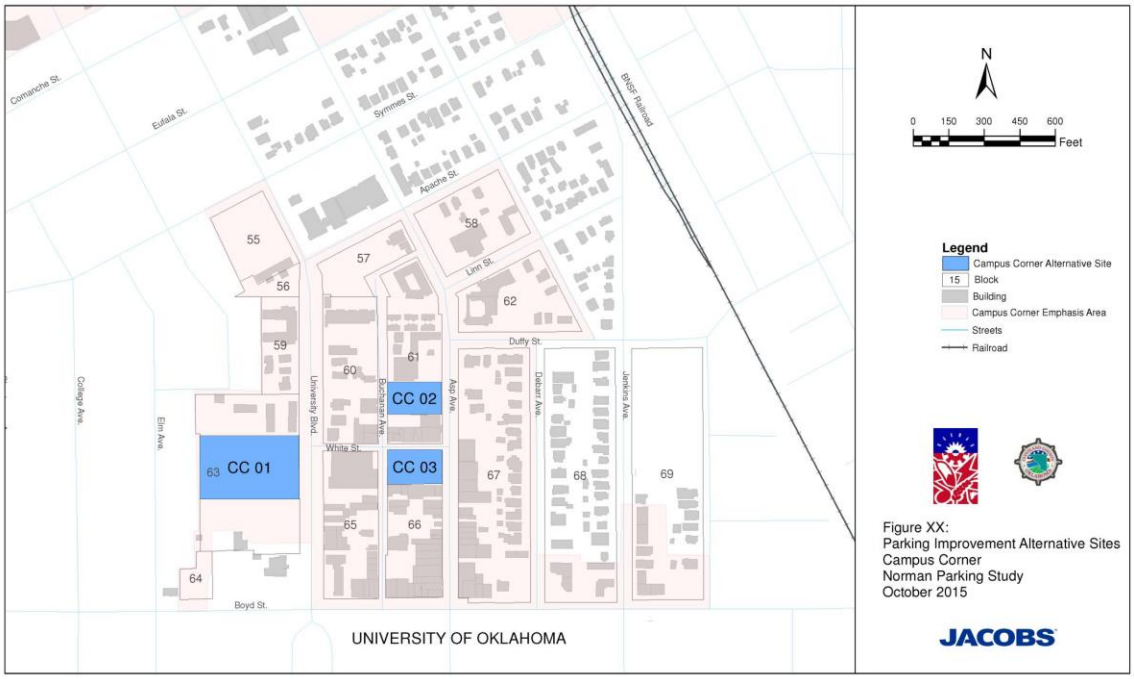


2025 Parking Demand – Alternatives for Improvement

Per the Jacobs methodology, the next step in the process is to determine candidate parking development sites based on need (projected demand and surplus/deficit conditions). This includes providing conceptual garage layouts that would provide number of spaces needed, incorporation of retail/other uses on ground floor and meet city/county design criteria and assessing candidate sites and selecting a preferred alternative(s).

The following graphic identifies the three "parking improvement alternative sites" in the CBD emphasis area from the 2016 report.

The graphic below identifies the three "parking improvement alternative sites" in the Campus Corner emphasis area.



Parking Management Strategies

In terms of recommended parking management strategies, the Jacobs study focused on the following six areas:

- Parking Enforcement
  - Will need additional enforcement as public facilities expand or are constructed as new
  - Parking system upgrades might aid enforcement time and efficiency required
- Parking Meters
  - May need additional meters for on-street parking if parking structures are built so that structured parking is competitive
  - Additional meters could be installed to finance parking improvements, to help pay for parking facility maintenance, and to encourage turnover of on-street spaces
- Parking Time Limits
  - May be easier to regulate time limits with parking meters. Fee structures could be easily adjusted to increase along with increased parking demands and to have shorter max. time limits
  - Encourage business patron voucher program if owners want to pay for customer meter fees
- Employee Parking Use of On-Street Spaces
  - Could strengthen tag identification system to identify employees using on-street spaces
  - Assist employers in identification of preferred parking spaces for their use
- Loading Zone Issues
  - Loading vehicles are often double-parked in through travel lanes in Campus Corner
  - Loading vehicles do not arrive within preferred 6:00 am to 10:00 am time window due to a long route schedule with multiple stops in addition to Campus Corner
  - More strict regulation of loading zone issues or possibly adoption of simpler ordinance should be considered (24-hour reserved loading zone space)
  - 6:00 am to 10:00 am window is limited
- Maintenance and Management of Publicly Owned Parking Infrastructure
  - Formation of an authority to manage existing public parking facilities and program and plan additional parking facilities as needed
  - Consideration of public-private partnerships to potentially open the door for private development that would not happen without additional investment in parking supply