City of Norman
Greenways Master Plan

Greenways Into The Future

April 2012

Greenways can draw people together in their communities to provide open spaces for all close to their own homes. They have the potential to be this country's most important land-based effort for conservation and recreation in the next several decades.

They can draw private and local entities into lead roles in provision of recreation opportunities. They can capitalize on the entrepreneurial spirit of Americans and give pride of accomplishment and responsibility to millions of people in every community. They can protect vital water, fish, wildlife, and recreation resources as integral parts of the growth of cities and communities.

And, if greenways truly capture the imagination and boldness of American spirit, they could eventually form the corridors that connect open spaces, parks, forests, and deserts – and Americans – from sea to shining sea.

- President's Commission on American Outdoors, Report and Recommendations to the President of the United States, 1986

Acknowledgements

The Greenways Master Plan was developed by the City of Norman Planning and Public Works Departments with the technical assistance and design help of Halff Associates. Special thanks go to the many residents, property owners, business owners, and community leaders for their insight and direction throughout the duration of this planning effort.

City of Norman – City Council

Cindy S. Rosenthal – Mayor
Roger Gallagher – Ward 1
Tom Kovach – Ward 2
Hal Ezell – Ward 3
Carol Dillingham – Ward 4
Dave Spaulding – Ward 5
James Griffith – Ward 6
Linda Lockett – Ward 7
Dan Quinn – Ward 8

Greenbelt Commission

Jane Ingels, Chair
Jack Eure, Vice Chair
Mary Peters
Robert Bruce
Mark Krittenbrink
Geoff Canty
Jim McCampbell
Richard McKown
Sarah Smith

City of Norman – Staff

Steve Lewis – City Manager
Susan Connors – Director, Planning & Community Development
Shawn O'Leary – Director, Public Works
Jud Foster – Director, Parks and Recreation
Angelo Lombardo – Traffic Engineer
Jane Hudson – Planner II
Jolana McCart – Administration Technician IV
Glenn Lauderdale – Internet Services Technician

Table of Contents *Page*

***SECTION 1 - NORMAN*:**
- Key Points of Norman 1
- Norman's Population & Growth 2

***SECTION 2 - INTRODUCTION*:**
- Why Plan for Greenways in Norman? 3
- Purpose of the Greenways Master Plan 4
- Methodology Used to Create this Plan 5
- Goals for Identifying Citywide Greenway & Trail Opportunities of Norman 5
- Major Citywide Destinations & Attractions 7
- Norman Greenway Key Recommendations Summary 7
- Identification of Citywide Opportunities – Maps
  - Citywide Recommendations 8
  - Planning By Watershed 9
- Key Guiding Principles of the Greenways Master Plan 10
- Evaluation of Existing Trails & Green Space in Norman 11

***SECTION 3 - GUIDELINES & DESIGN STANDARDS*:**
- Greenway Users 13
- Possible Trail Types for Norman 13
- Trail Design Standards 16
- Community Nature Trails in Sensitive Areas 17
- Wide Pedestrian Corridors 18
- Trail Access Points & Trailheads 20
- Recommended Trail & Greenway Amenities 22
- Trail Material Recommendations 25
- Potential Greenway Corridors 28
- Potential Neighborhood Greenway Corridors 29

***SECTION 4 - IMPLEMENTATION STRATEGIES*:**
- Who Will Implement the Plan? 30
- Greenway Implementation Strategies 30
- Greenway Implementation Process 30
- Greenway Corridor Acquisition &/or Preservation Strategies 31
- Incentives to Preserve Open Space 33
- Conservation Easements 34
- Funding Sources 34
- Recommended Funding Sources Within the City of Norman 35
- Recommended Funding Sources Outside the City of Norman 35
- Implementation Strategies for Development Funded Segments 36
- Maintenance of Greenway Corridors 37
- Maintenance of Trails - Estimated Needs 39
- Implementation Timeframe 2011-2030 41
- Adoption of this Greenways Master Plan 42

Table of Contents *Page*

TECHNICAL APPENDICES BOUND AS SEPARATE DOCUMENTS

TECHNICAL APPENDIX A – Implementation Guide of Trails and Open Space

- Ten Mile Flat
- Tributary G
- Brookhaven Creek
- Merkle Creek
- Woodcrest Creek
- Imhoff Creek
- Bishop Creek
- Little River
- Rock Creek
- Canadian River
- Lake Trail South Greenway
- Waterline Greenway
- Lake Thunderbird

TECHNICAL APPENDIX B – Action Plan for Completion of the Greenways Master Plan

- Action Plan for Completion of Greenways Master Plan, October 26, 2009 ..... B:1
- Map - Greenway Opportunities Classified by Storm Drainage System B:3
- Map - Greenway Opportunities Along Urbanized Floodplains & Alternate Routes B:4
- Map - Greenway Opportunities Spine/Loop Trail & Connectors B:5

TECHNICAL APPENDIX C – Summary of Public Input

- Public & Stakeholder Input C:1
- Comments from the 2006 Citizen Dialogue C:2
- Citizen Input from Opinion Surveys C:3
- Greenbelt Commission Input C:4
- Storm Water Master Plan Task Force Input C:4
- Public Input Meetings & Presentations C:5

SECTION 1 - NORMAN

Key Points of Norman

Norman is the largest city in and the county seat of Cleveland County in the state of Oklahoma, and is part of the Oklahoma City Metropolitan Statistical Area. Norman is situated approximately 20 miles south of downtown Oklahoma City and is the third largest city in the state. Norman is the business and employment center of Cleveland County.

Norman is best known as the location of the University of Oklahoma (with about 22,000 full-time students), making Norman a center of culture, technology, and scientific research. OU is home to the Sam Noble Museum of Natural History, one of the largest of its kind, and the Fred Jones, Jr. Museum of Art. The Fred Jones Jr. Museum made news in 2000 when it was given the Weitzenhoffer Collection, the single most important collection of impressionist art ever given to an American university. The collection includes work by Mary Cassatt, Vincent van Gogh, Paul Gauguin, Pierre-Auguste Renoir, Camille Pissarro and other collections.

Growth in Norman is occurring close to campus, where infill developments are underway, making Norman a denser and more attractive college town. The central and eastern sections of town are older and include areas around the OU campus and downtown. Both areas retain much of their historic appearance and resemble what most people would think of as the core area of a college town.

Norman's picture-book Main Street is a great source of pride for Normanites, as are the many shady, tree-lined neighborhoods that surround the OU campus. The west and north sides of town have seen the most development in recent years, including areas like Brookhaven, a large neighborhood of townhouses, apartments, large estates, upscale retail and dining.

Norman's Population & Growth

Norman's growth over the last three decades has been steady and has transformed the city into one of the most dynamic and desirable communities in Oklahoma. The city's population has more than doubled from 52,117 in 1970 to 110,925 in 2010. (Refer to below table.)

Over the next few decades, the population of Norman is expected to continually increase, with a projected population of 120,000 by 2030. The eastern half of the city has significant room to grow which presents many development and recreational opportunities as well as challenges associated with the need to protect Norman's quality and supply of water. Both the surface water and water wells supplying the City of Norman's drinking water are located in the eastern half of the city.

Population Growth for Norman and Cleveland County				
	City of Norman		Cleveland County	
Year	Population	% of Growth	Population	% of Growth
1970	52,117	-	81,839	-
1980	68,020	30.51	133,173	62.73
1990	80,071	17.72	174,253	30.85
2000	95,694	19.51	208,016	19.38
2010	110,925	15.91	255,755	22.95

SECTION 2 - INTRODUCTION

Why Plan for Greenways in Norman?

A citywide greenways plan provides an outline from which the public and private sectors can collaborate to create beautiful, functional trails and open space corridors. The goal of Norman's Greenbelt Commission is to support and promote the development of an environmentally friendly system of connected trails and greenways while locating trails in areas with due consideration to current and future land owners on a case-by-case basis. These trails and greenways will provide opportunities for increasing recreational activities, improving health and promote using alternative modes of travel.

The significant benefits derived from greenbelts are many. Across the United States greenbelts and natural trail corridors are and have long been one of the most popular physical features of most communities.

In a preliminary survey Norman citizens noted the following benefits of a greenway system:

- Greenbelts and trails help to preserve natural areas and can beautify the city.
- Greenbelt conservation will benefit storm-water management by preserving floodplains and drainage areas. Greenbelts do not necessarily have to be public spaces. These naturally preserved areas will still benefit the overall quality of the city if they retain their natural characteristics.
- Greenbelt conservation can also benefit the city by creating natural green corridors for trail uses. The uses of these trails can vary by surface type; a concrete trail in an urban environment or a natural surface type in a rural undeveloped environment.
- Trails offer something for everyone of all ages seeking a tranquil place to walk, relax or exercise. Trails provide the opportunity to see other neighborhoods and the beautiful natural settings of the city.
- Trails can help promote healthy lifestyles by encouraging people to get outside. Trails can offer multiple ways to exercise, whether it is simply walking or more strenuous activates such as running, roller blading or cycling.

The Greenways Master Plan is designed for the citizens of Norman. Norman is home to residents from many different backgrounds that share a common desire to live in a city that focuses on providing a high quality of life, facilities, and standards.

The visionary component of this Plan anticipates a network of beautiful corridors that allow a user to go easily anywhere in Norman by walking or riding a bicycle. An ultimate goal of this Plan is connections to all neighborhoods via readily accessible, safe and attractive pathways, whether they are bike lanes on streets, sidewalks, or trails in a more natural setting.

Imagine Norman 20 years from now with preserved greenway corridors, trails, trees, and shaded places for walking and recreation.

The Purpose of the Greenways Master Plan

The need for citywide greenway and trail corridor preservation was originally established as one of the key goals by the citizens of Norman and noted in the 2020 Comprehensive Plan. The committee for the 2020 Plan anticipated future growth and the pressing need to preserve open space for storm-water drainage and as potential locations and opportunities for a trail system.

The goal of developing the Greenways Master Plan is to facilitate the movement of citizens in a safe and efficient manner within the city network of streets, at any level, as well as throughout open spaces. The principal goal is to make Norman a pedestrian friendly community by determining how and where to link trails and open spaces to neighborhoods, schools, parks and businesses.

By nature of their locations relative to developing areas of Norman and the open areas, possibly yet to be developed, citywide greenways present individual opportunities for development and they play different roles within the city. Linkage between properties and existing landmarks can expand the value of each site and build a network of connected amenities throughout the City of Norman. A prime example is the segment of the Legacy Trail which runs along the railroad corridor in central Norman. Legacy Trail will eventually be expanded to take the enthusiast around central Norman and up to Ruby Grant Park in northwest Norman.

In planning for greenways, this Plan considers both the population of today and areas where additional growth could occur. It also considers the framework of the city today, looking at the many key destinations and attractions that should be accessible from a trail system.

This Plan is intended to be flexible so as to remain a viable tool as Norman continues to prosper and change. The intent is for this plan to serve for many years; it should be periodically updated to reflect current conditions within the city, its neighboring communities and the greater Oklahoma City area as a whole.

Methodology Used to Create this Plan

Identify Major Citywide Destinations and Attractions

Evaluate Existing Greenways and Trails

Gather Citizen Input in Identifying Greenbelts and Trail Opportunities Citywide

Analyze Corridor Suitability Analysis

Identify Trail Opportunities

Identify Materials for Trails

Analysis of Criteria to Prioritize Trails

Develop Implementation Plan

Creation of Appendices

Goals for Identifying Citywide Greenway and Trail Opportunities of Norman

Norman has many opportunities to create greenways and trails in locations throughout the city. Over the next two to three decades, it is anticipated that many of those opportunities can be developed as greenways with the possibility of trails, both natural and improved, located within these zones.

The city, other local groups and commissions should integrate greenway and trail planning efforts with other transportation planning and funding efforts at the state and local levels. To keep every aspect of multi-modal travel strong Norman should unite with transportation improvement projects as well as long range and current land use, economic development incentives, parks and recreation and environmental and community planning efforts for developing greenways and trails. With these efforts the community can continue to develop pedestrian accessible areas. Trails don't have to be in the woods; trail development could also be along streets with designated areas for pedestrians. Norman could develop and adopt a portion of the "Complete the Streets" policy which incorporates appropriate facilities for all modes of transportation in roadway design. It is the goal of this Plan for all trail types to follow a general standard as provided by the American Association of State Highway and Transportation Officials (AASHTO).

Implementation Guide for Trails and Open Space - Appendix A

A supplement to this Greenways Master Plan is Appendix A, an "Implementation Guide for Trails and Open Space". The Implementation Guide should be utilized by the developers, city staff, Commissions and City Council as guidelines in establishing and developing trails and corridors. The Implementation Guide, although not adopted as part of this Plan, suggests a citywide network of corridors and trails. The corridors were evaluated to see if conditions were suitable to establish a greenway system. Those areas were then divided into segments and prioritized.

The Implementation Guide also contains cost projections for several of the recommended trails. These projections are only guidelines, cost won't be known until the project goes to bid.

The Implementation Guide was created to assist in the design of particular trail types; the cost for these types of trails was estimated using 2009 values. Updated cost estimates will need to be calculated at the time of design to determine monies needed for build-out. These are only estimates/guidelines for the developer, and actual costs will not be identified until the project goes to bid.

Greenway corridors are "transportation pathways" that provide for the movement of people throughout activity centers within the city. The city should plan for a regional network of corridors that connect walkable nodes. Corridors should be created to emphasize the unique natural and man-made qualities of the city. The greenways planning process involves first assessing the intent and purpose of the greenway corridors. Who will use them? How will they use them? The process looks at where key destinations such as parks, schools, civic facilities and other attractions occur in the city. The "suitability" of individual corridors was evaluated using a matrix developed with the oversight of the Greenbelt Commission. This matrix evaluated the connectivity, ownership of the property, compatibility with adjacent land uses, environmental and physical characteristics, and the level of public support for each corridor. Corridors were then identified by the planning team, staff and citizens during initial public meetings. These corridors were then evaluated using a matrix containing a series of key criteria. This information can be found in Appendix A, Implementation Guide of Trails and Open Space.

Action Plan for Completion of the Greenways Master Plan - Appendix B

As an additional supplement to this Plan, in Appendix B, is the "Action Plan for Completion of the Greenways Master Plan" which was developed by the Greenbelt Commission in October 2009. This Action Plan outlines supplementary areas where trail development is possible within the storm drainage system and urbanized floodplain areas. The Action Plan highlights the potential areas for a loop/spine trail around the city, continuing out to the lake and back into town, and the additional smaller connector trails within developed areas considered necessary to complete this loop. The Action Plan also suggests the prioritization of existing sidewalks and trails which call for expansion. These maps simply suggest areas of trail development, the locations will need to be further analyzed to take into account private land ownership as well as to identify easements and rights-of-ways. This Action Plan is an additional guide or tool to assist in the development of trails throughout Norman on a case-by-case basis as it is not feasible to determine the exact placement of trails without evaluation of all factors involved, i.e. land owners/property lines, topography and costs.

Summary of Public Input - Appendix C

The final supplement to this Plan is the "Summary of Public Input", Appendix C. Public Input contains outlines and highlights from the many meetings held to gather ideas and goals for the completion of this Plan in addition to placement and design of greenways and trails throughout the city.

In Summary

Norman is a fast-growing community. Consequently, many of the smaller neighborhood trails noted in the Implementation Guide are routed through already developed parcels, leaving few

opportunities for natural trails. As stated some areas are not conducive for trails. In those cases trail placement, route and alignment will be developed on a case-by-case basis following a review of the area, location of existing development and overall accessibility. It is possible trails could be re-routed at specific points to utilize streets and sidewalks within designated areas for pedestrian access. In such areas the idea of the trail system won't be lost, and connectivity can be achieved via alternate routes.

The greenways and trails referenced in the Implementation Guide represent both existing and proposed trails throughout the city. These maps should be used as a tool to guide the continuity of future open spaces and to construct future trails which could be entwined with neighborhoods, commercial areas and all future developments in the city. To reiterate, the trails noted are not intended to show precise alignments or locations of trail improvements.

Major Citywide Destinations and Attractions

Key potential destinations throughout the city have been identified as part of the trail planning process.

Key destinations include:

- Schools, particularly elementary campuses
- University of Oklahoma
- Existing parks and recreation destinations
- Key city facilities
- Major employment areas
- High density residential areas
- Major retail areas
- Lake Thunderbird
- Downtown Norman
- Canadian River

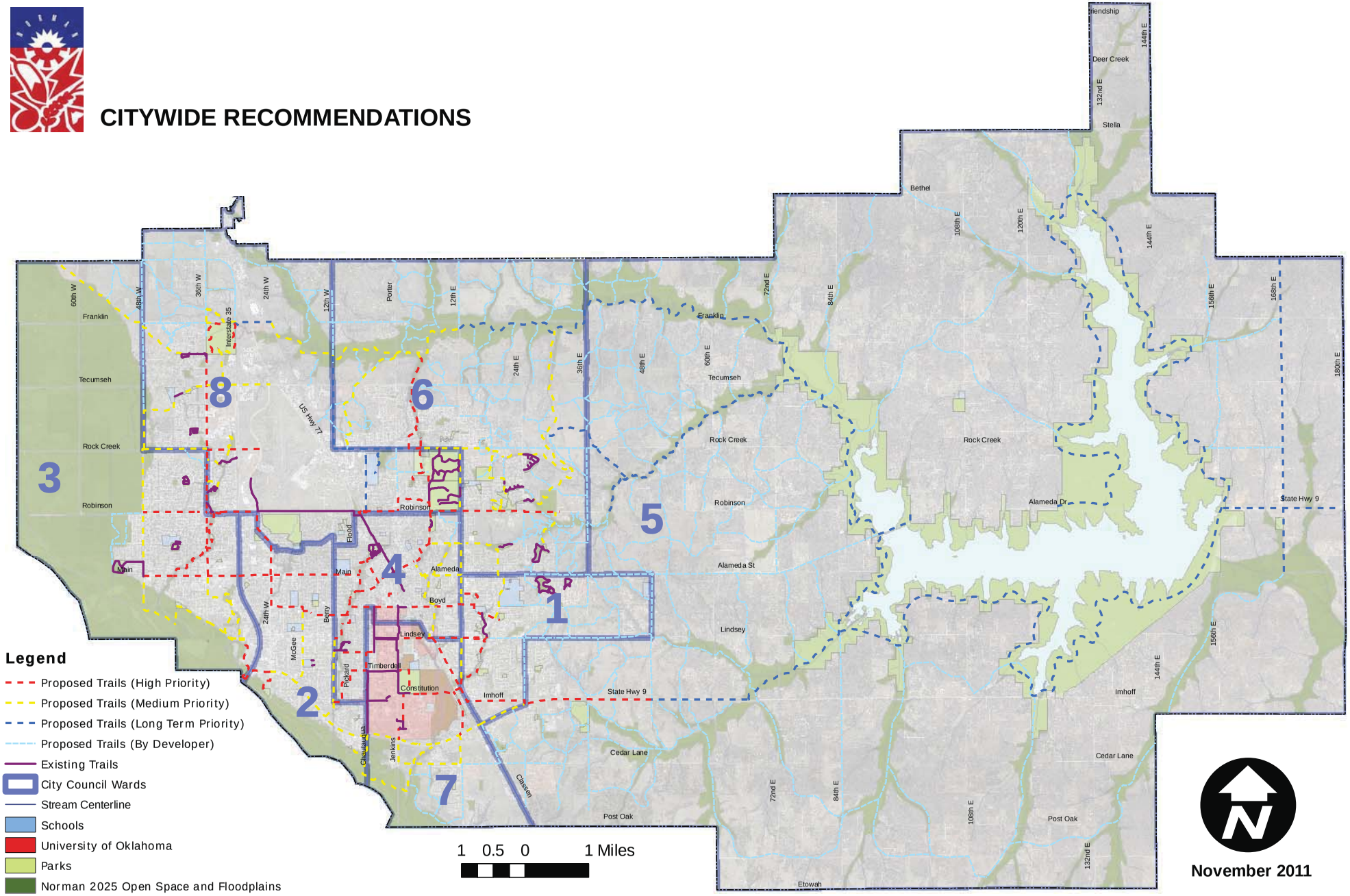
Connection to these destinations can promote usage of corridors and can also enhance submissions when applying for competitive grant funding.

The city does not automatically have access to private properties to create trails and open spaces; access will depend on the cooperation of the individual property owners. Access may also depend on development occurring within the area, in addition to the topographical constraints. With new development, opportunities arise for greenways and trails to be considered during the development process.

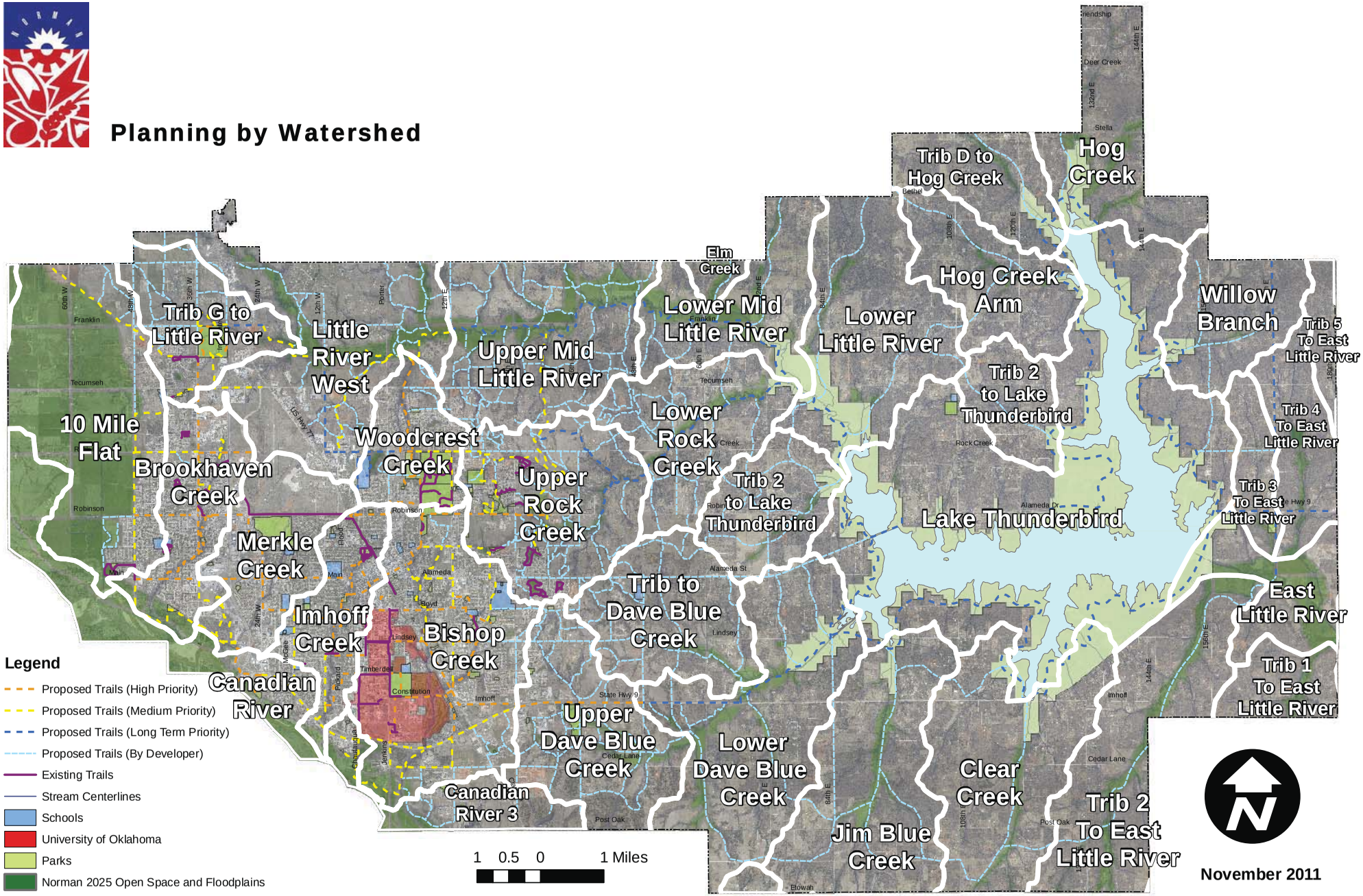
Norman Greenway Key Recommendations Summary

The following two maps are a summary of the proposed trails and greenways in Appendix A. These major greenways and trails will be the larger connecting points for the smaller neighborhood trails an important factor in creating the desired connectivity throughout Norman. The location of these trails will be determined through consultation with adjacent land owners as the area develops. Establishing trails in harmony with existing homes and land owners will be an important goal of the Greenbelt Commission. With the combination of new development, trails, corridors, open space and existing greenways, Norman has the potential to be a "green" city.

CITYWIDE RECOMMENDATIONS



Planning by Watershed



November 2011

Key Guiding Principles of the Greenways Master Plan

The system of trails and pedestrian connections recommended in this Plan creates an opportunity to enhance not only recreational opportunities but also to influence commuting patterns throughout Norman for residents and visitors. The following guiding principles were developed through the master planning process and serve to guide the alignment and layout of trails and pathways proposed in the future.

1. Create an interconnected system – The ultimate goal is to create an interconnected system of trails that allow multiple connections across all of Norman. Trails, corridors and alignments should be designed to enhance connectivity. This connectivity may range from simple neighborhood sidewalk connections to the trails, to complete "trail heads" with parking and comfort facilities such as shade shelters and restrooms.

2. Create opportunities for green space preservation – The greenbelt system should preserve valuable open space, natural habitat and key areas with existing vegetation. These areas will become the green areas of the "Norman of the Future".

3. Create identity - Trail segments should be designed to convey the physical and historical character of the area. Any decorative installations should relate back to the history of the neighborhoods through which the trails pass. Wayfinding signage provides valuable information at optimal decision points, helping users find their way through the built as well as the natural environment.

4. Enhance learning - Greenways can provide unique opportunities to learn about the history, culture, and accomplishments of Norman. Greenways provide access to the natural environment in the city and should offer ample opportunities to learn about the community.

5. Promote safety -Trails should provide smooth walkable pathways that are open and visible at all times during the day.

6. Contribute to the beauty of the city - The trail system should enhance the physical appearance of the city, whether through new pedestrian features, landscaping added to the trail corridors, or simply by revealing natural areas not previously visible to the general public.

7. Encourage creating partnerships – The citywide greenways system should encourage the creation of public and private partnerships that help build the entire system in a timely manner for all to enjoy.

Evaluation of Existing Trails & Green Space In Norman

The Plan uses existing trails, parks and greenbelts as a starting point for extending the network of trails and green corridors throughout the city.

Kevin Gottshall Park Trail/Greenway: This greenway preserve is located in southwest Norman. This neighborhood development utilizes the drainage areas for public green space. This is a beautiful example of what future development could provide.

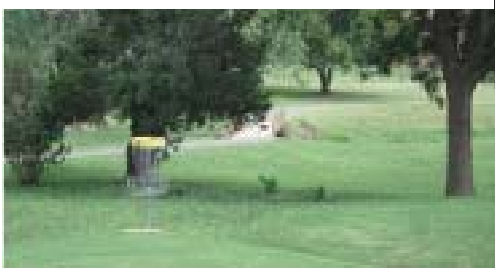
Kevin Gottshall Park

Legacy Rail-Trail/Greenway: The Legacy Rail-Trail is built along an abandoned rail line corridor. The trail begins just north of the University of Oklahoma campus and links downtown Norman and Andrews Park. Areas along the trail consist of newly planted street trees, varied paving materials and widths of trails. This entire trail is a great connection to the University North Park development, downtown Norman, and the University of Oklahoma.

Legacy Rail-Trail/Greenway

Colonial Estates Park Trail along Bishop Creek: This corridor runs along an eastern branch of Bishop Creek. A 10' wide asphalt trail runs through the park. There is potential to expand this trail and greenway north and south to help beautify the city and connect east Norman to the urban core and west to the University of Oklahoma.

Colonial Estates Park Trail along Bishop Creek



Neighborhood Sidewalks: Norman has an extensive system of neighborhood sidewalks, especially in the urban core and established neighborhoods.

Neighborhood Sidewalks

Castle Rock Utility Easement Trail: This trail utilizes a power line easement which runs through the Castle Rock subdivision. This trail connects to an elementary school, another subdivision, Carrington Place, and will also connect residents to the future Ruby Grant Park.

Castle Rock Utility Easement

Hall Park Greenbelt: The Hall Park Greenbelt system is a great example of a development preserving open space for both public uses and drainage easements. The trail loops around the Hall Park neighborhood.

Hall Park Greenbelt

Sutton Urban Wilderness: The Sutton Urban Wilderness area was preserved by the city for public open space. It is the city's intention to keep this greenway in its natural state. The area contains many soft surface trails for users to experience this natural area

Sutton Urban Wilderness

Planned Trails for Ruby Grant Park: The trails plan for Ruby Grant Park calls for over 2 miles of trails within the park. These trails will provide a first-class cross country track facility, as well as an access point for Legacy Trail.

Planned trails for Ruby Grant Park

Trails and Green Space in Existing Parks: Many other trails occur in parks throughout the city. These tend to be self-contained within each park.

Trails & green space in existing parks

SECTION 3 - GUIDELINES & DESIGN STANDARDS

Greenway Users

Greenways should accommodate a variety of users. A high level of activity on a trail encourages users and lends a sense of safety and comfort. When a well planned trail is long enough it can provide a tranquil respite from a busy urban area.

Walkers – Relaxed walkers along a pleasant corridor may include senior citizens, or parents with children. These participants may occupy a significant portion of the trail due to walking side by side.

Joggers and runners – These users typically make use of trail corridors for exercise and activity. Higher speeds of runners may conflict with slower users of the trails. These users prefer softer tail surfaces such as decomposed granite.

In-line skaters – Due to the swinging motion of their arms to increase momentum skaters occupy a large cross section of a trail.

Recreational and inexperienced cyclists – These users typically use trails for exercise and activity, they are interested in scenic appeal and connectivity of the trail system, and prefer more interesting trail alignments rather than trails built for higher speeds. This group may also include children and youth going to school.

Commuters and higher speed cyclists – Experienced riders are typically interested in higher speeds. These riders often favor roadways over off-street trails. For off-street trails, alignments with shallower curves are favored because they allow higher speeds. Increased trail widths are recommended to reduce conflicts with other trail users.

Mountain/trail biking – Users can travel on crushed rock or more natural trail surfaces and prefer trails with challenging terrain.

Possible Trail Types for Norman

Whether users are young or old, active or just seeking a few minutes outside in a beautiful area, trails appeal to everyone. This section lays the foundation for trail types that could be built in Norman. Guidelines to trail development help establish a clear picture of what the entire system will be like in the future.

Community-Wide (Regional or Arterial) Trails

Community-wide trails are designed to provide access from one part of the city to another. In essence, these trails become the "spine" of the city, providing a trouble-free route to travel longer distances. Community-wide trails are often a high priority since they provide connectivity between many different parts of the city. These trails are typically between 10'-12' wide, depending on anticipated traffic volume.

Community-wide trails

Sidewalk Trails

Where sidewalk connections are recommended in this Plan, walkways set at a minimum 5' wide are recommended. Also, where feasible, along major roadways it is recommended to have a pedestrian running trail along one side of the sidewalk. A sidewalk is also a considered a trail, a trail does not have to be constructed of natural materials. Sidewalks are intended to be points of connection for some areas in Norman.

6' wide neighborhood sidewalk.

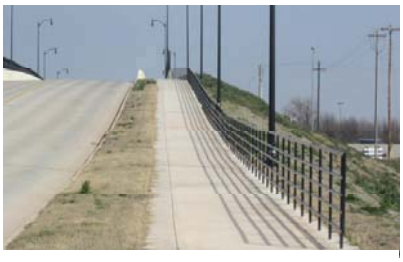
Neighborhood Trails

Neighborhood trails mimic the system of local neighborhood streets which ultimately connect to larger arterial trails. The neighborhood trails provide access from each neighborhood to the larger "arterial" trails. Neighborhood trails are typically 6' to 10' in width and should be constructed with concrete for long range durability. Tighter curves are suggested to introduce interest into the trail segments. As in the case of arterial trails, some neighborhood trails can have a crushed granite component for runners directly adjacent to the concrete trail. If no danger of excessive flooding occurs, neighborhood trails may also be built out of decomposed granite.

8' wide neighborhood trail

"Parkway" Trails and Sidewalks

Often times the best trail corridors are adjacent to major collector or boulevard streets. Unlike sidewalks, these trails are wider, a minimum width of 6', but 8' is preferred. Typically, these trails are constructed of concrete, and usually include amenities such as decorative light fixtures, landscaping and ground cover as-well-as varying surface treatments at intersections and crosswalks. The overall parkway width should be at least 15' to 20' in width, to allow for a minimum 6' of clearance between the street curb and the walkway, another 4' +/- between the walkway and the adjacent property line is recommended. In many cases additional width may be required to accommodate drainage or other utilities.



Wide attractive pedestrian corridor.

Natural Trails

These trails should be at least 8' to 10' in width, but in some cases may be 12' to 15' in width to allow for greater visibility within the understory. The trail surface will be compacted earth, and normal obstructions such as roots, rocks and understory vegetation should be cleared from the pathway. An additional 2' to 4' shoulder zone is desired on either side. Bridges and drainage crossings should be constructed using wood and timber materials and should be rustic in appearance.

Nature trail along a levee.

Greenway Corridor Natural Trails

These areas include natural corridors that exist along some of the river or stream corridors in the city. In some cases, these corridors may be used as walking trails, but with only minimal improvements to not disrupt the natural setting. Additional improvements are needed to address street crossings in designated areas. A stream corridor in a relatively undisturbed setting is normally well vegetated. Well-vegetated corridors protect water quality and natural habitat. In addition, the riparian vegetation also stabilizes stream bank soils against erosion.

Natural trail area.

On-Street or Striped Bike Lanes

On-street bicycle facilities are equally important to connecting the city Neighborhood routes should be identified that permit relatively easy riding. Specific facilities for cyclists include striped bicycle lanes that are a minimum 4' (5' is preferred for inexperienced rider comfort) in width from the street edge of the gutter pan, or in some cases the use of the "sharrow" which indicates a shared use lane. The "sharrow" is in the final stages of approval for inclusion in the Manual of Uniform Traffic Control Devices (MUTCD), but municipalities may apply for permission to use this new symbol prior to its formal adoption.

Sharrow

Off-street trails that are intended to accommodate bicycles are referred to as shared use paths. Most trails in Norman should be designed to readily accommodate bicycles.

Other Specialized Types of Trails

Water Trails

For many, a casual one to two hour trip in a canoe is adequate, and it allows a much different perspective of the river. These water trails require boat ramps or landings as well as parking for trailers and vehicles. Signs can be placed along the river to note special locations.

Equestrian Trails

Locations to ride horses are rare so close to a major city. Equestrian trails would offer an opportunity for a unique recreational venue in Norman. Equestrian trails require additional clearance and parking for trailers is required. A close permanent stabling operation greatly increases the use of these trails.

Trail Design Standards

Major Community-Wide Trails

- Recommended minimum width 10' minimum, 12' for key corridors
- Surface - Concrete or asphalt (Concrete preferred)
- Access points - Every ¼ to ½ mile (Maximum ½ mile walk or ride to access point, but ¼ mile preferred)
- Minimum trail corridor width – 50' width minimum
- Other facilities - Parking, locater maps, water fountains, shade shelters, bike racks, interpretive/historic signage

Regional Trails

- Recommended minimum width 12'
- Surface - Concrete
- Access points - Every ½ mile (Minimum ½ mile walk or ride to access point)
- Minimum corridor width - Varies - 50' width
- Other facilities - Parking, locator maps, water fountains, shade shelters, bike racks, interpretive/historic signage

Neighborhood Trails (Off Street)

- Recommended minimum width 6' to 10' (8' preferred)
- Surface - Consider a pervious surface if a feasible material is available although concrete is typical.
- Access points - From neighborhood streets, parks, or schools; maximum ¼ mile to access points
- Minimum trail corridor width 20' width

Parkway Trails (Adjacent to Streets)

- Recommended minimum width 8' to 10' width (8' preferred)
- Surface - Concrete, crushed granite (concrete typical)
- Access points - Adjacent to major arterials and collector streets, parks

Nature Trails

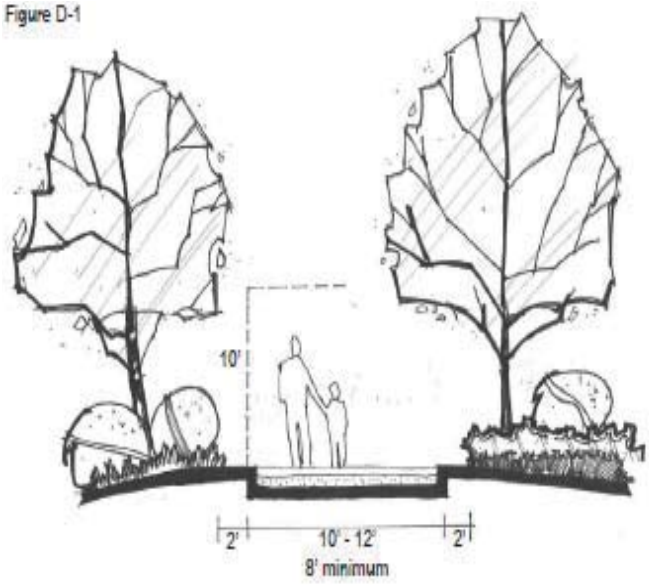
- Recommended minimum width 8' to 12' width
- Surface - Crushed materials or natural surfaces
- Access points - Adjacent to major arterials and collector streets, parks,
- Other facilities - Parking, locater maps, water fountains, interpretive/historic signage

Trails should be designed to conform to standards recommended by the American Association of State Highway and Transportation Officials (AASHTO). These standards have been developed and refined over many years and are regarded as the most comprehensive safety standards in the industry. In some cases, variations from AASHTO may be acceptable in order to protect the character or special conditions of an area. When choosing locations for bicycle trails one should consider the number of intersections or drives in place as each intersection or driveway creates a conflict point between cyclist and motor vehicles.

Illustrations below and on the next page indicate typical preferred trail section characteristics and clearances.

Figure D-1 illustrates a typical shared use design that is appropriate for arterial trails. This trail is designed to accommodate two-way bicycle and pedestrian traffic, typically has its own right-of-way, possibly and easement, and can accommodate maintenance and emergency vehicles. This type of trail is typically paved (asphalt or concrete) but can also be constructed of a material that provides a smooth surface, as long as it meets ADA requirements. Although not depicted wider soft shoulders can be provided for equestrians and runners/joggers if space allows. While vegetation is encouraged to enhance the trail experience, complete blocking out of the trail by vegetation from neighborhood view is discouraged. This results in a tunnel effect on the trail, decreasing the notion of safety.

Figure D-1



Community Nature Trails in Sensitive Areas

For community trails that will be located in environmentally sensitive areas, as shown in Figures D-2 and D-3 (following page), several measures are recommended to lessen the impact of the trail and trail users on the area.

- The riparian setback should be as wide as possible: 30 to 50' is recommended
- Slope the trail away from the waterway or pre-treat trail run-off with a trail side swale
- Trail surface should be constructed with crushed or natural surface treatments
- Limit vegetation removal
- Design with flood conditions in mind
- Remove invasive plant species
- Use the trail as an opportunity to restore and enhance the waterway or environmentally sensitive area

Figure D-2

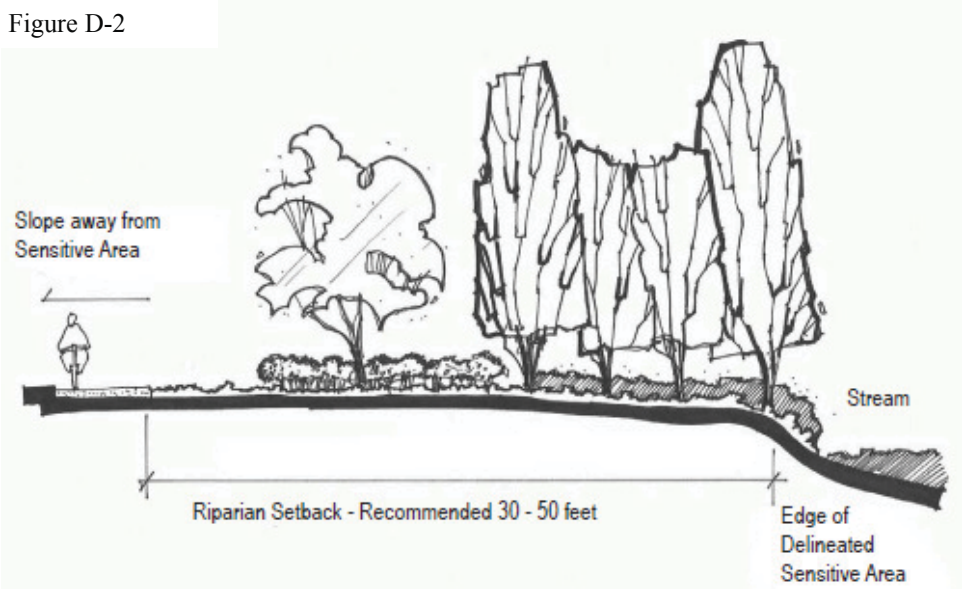
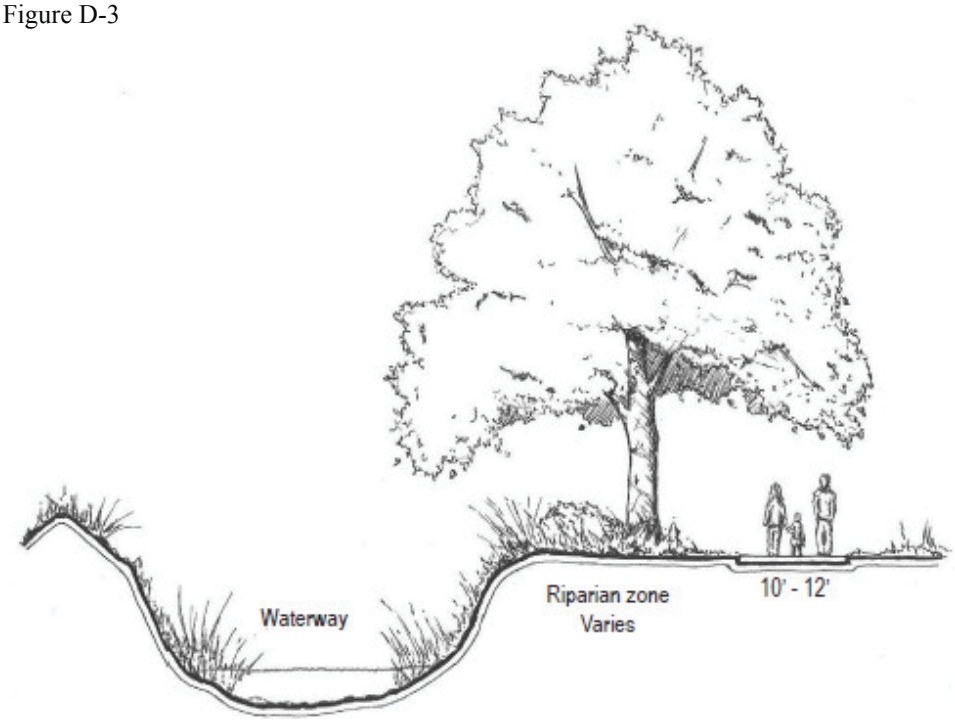


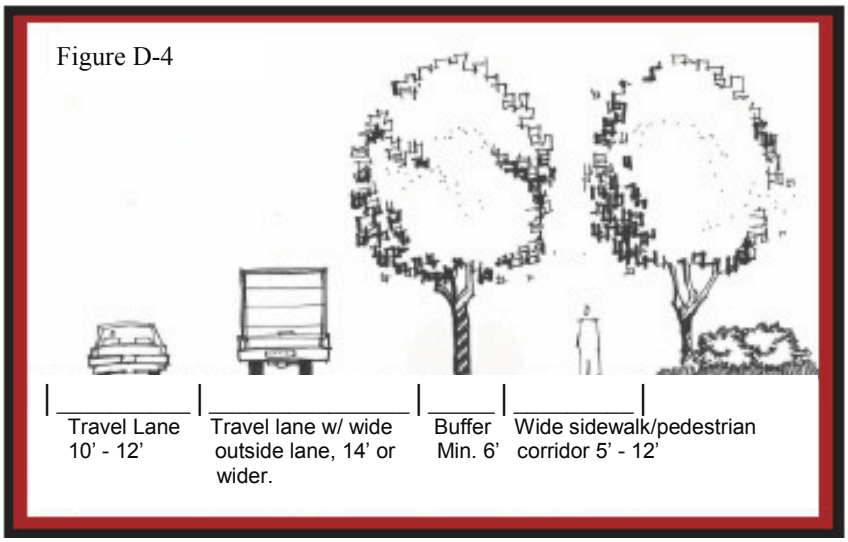
Figure D-3



Wide Pedestrian Corridors Along Roadways

Corridors along roadways have the potential to become one of the most important arterial connectors of Norman. Figure D-4 illustrates an enhanced street design that is appropriate for trails along roadways and thoroughfares in Norman. These trails are adjacent to the roadway, and the setback from the roadway should be based on the classification of the adjacent roadway, as shown in Table D-1 (next page). This design is recommended along all scenic roads in Norman

.



Street enhancements are intended for pedestrians and are designed to create connections between foot trails and the community trails, as well as to connect popular destinations throughout Norman. These enhancements will be necessary in areas where suitable greenway corridors are not available.

Trail Access Points and Trailheads

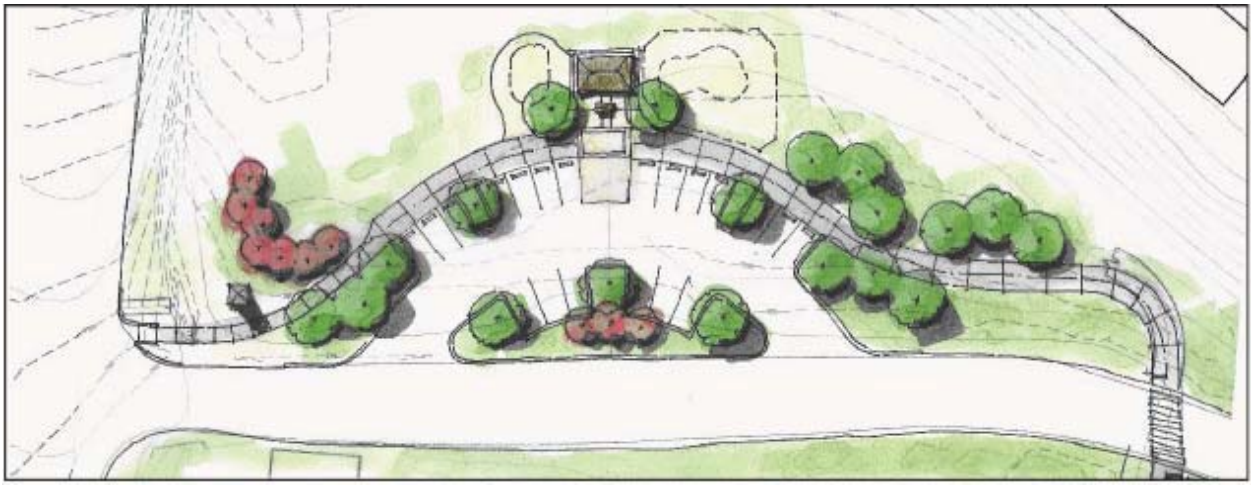
Table D – 1 Setback Recommendations	
Roadway Classification	**Recommended Minimum Trail Setback**
Residential	Minimum 2 feet without trees
Collector	Minimum 5 feet, 6 feet preferred
Arterials & Highways	Minimum 10 feet

In the urban area of Norman, a high level of accessibility will be desired along trail corridors. Well designed, frequent access points encourage use of the trail by area residents. A well-thought-out design of the trail can increase a sense of security for users. Access points should be 1/8 of a mile apart for neighborhood trails, and typically no more than 1/4 to 1/2 mile apart for all other trail types.

Two types of neighborhood trail access points include:

- Access from adjacent neighborhood streets
- Access from specific trail heads in parks

Below is an example of a well designed access point or trailhead. It is important that each access point or trailhead have a unique, positive image that the user takes with them and makes them want to return.



Typical Trailhead

Amenities may include the following:

- Parking which can vary from just a few to as many as 10 to 20 cars at popular locations
- Small Shade Pavilion
- Drinking Fountain or Spigot
- Safety Call Box (Optional)
- Kiosk with Trail Map and Information
- Bicycle Parking Stand
- Fitness Stations or Warm-up Stations ` (Optional)
- Landscaping (Optional)
- Major Trail Identification Signs
- Restrooms (Optional in park locations)

Other Trail Features

In order for the trails system to be a successful community amenity the trails should appeal to a wide variety of users. To achieve this success the trails should be designed to provide a high level of user conveniences. The demographics of the community include both elderly and young users. These groups will use the trail more often if amenities are provided.

Recommended Trail & Greenway Amenities

Benches: Utilize wood composites with metal detailing.

Bike Racks: Installation of bike racks should comply with the styles in the adopted Zoning Ordinance.

Milepost Markers: Mileposts greatly increase use of the trail by joggers and cyclists looking for set workout distances. It is recommended incorporating milepost markers onto fixed wood or concrete bollards. Signage should be consistent with other trail signage. Increments of 1/4 and 1/2 mile can be used to add further interest.

Trash Receptacles: The trail should establish the National Park Service's ethic of "pack it in, pack it out".

Dog Waste Pickup Stations: Dog waste pick-up bag dispensers should be placed at trail heads and key neighborhood access points along the route. Signs should be placed along the trail reminding dog owners to pick up after their dogs.

Information Kiosks: Trail head stations should provide trail users with information and the rules and regulations of the trail. Involving school children, university students and civic organizations in the research, design and construction of these kiosks would be an excellent community activity.

Directional Signage: Directional signage should impart a unique theme so trail users know which trail they are following and where it goes. The theme can be conveyed in a variety of ways: engraved stone, medallions, bollards, and mile markers. A central information kiosk at trail heads and major crossroads can assist users in finding their way and acknowledge the rules of the trail. Kiosks are also useful for interpretive education about plant and animal life, ecosystems, and local history. (see figures D-5 and D-6)

Figure D-5

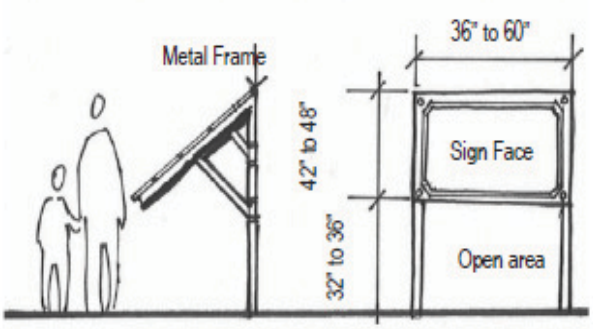
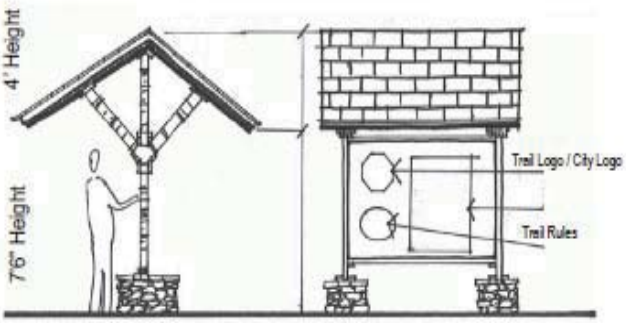


Figure D-6



Other Trail Features

Restrooms: Where appropriate at major trail heads.

Materials proposed to be used for amenities should be approved by the City of Norman prior to construction. For recycling and maintenance purposes, the city should use wood composite materials for amenities where wood is specified; wood composites have the aesthetic qualities of wood, but are more durable for park amenities.

Other Trail/Greenway Amenities and Considerations

Bridges

From a user's perspective bridges should be at least as wide as the trail; preferably 1' to 2' wider on each side. This is so pedestrians can stop and view the adjacent scenery without obstructing the trail. Any bridge that is specifically designated for bicycle traffic must have an appropriate rub-railing for bicyclists.

Bridges should accommodate maintenance vehicles if necessary. The bridge should not constrict the floodway. All bridges and footings in the stream corridor will need to be designed by a registered geotechnical or structural engineer. Cost, design and environmental compatibility will dictate which structure is best for the trail corridor.

Underpasses

Underpasses provide a more direct route to go under a busy street. From the standpoint of a user, underpasses should be well lit, attractive and most of all project a sense of security. Where adequate clearance is available, a minimum clearance of 8' is recommended but 10' is preferred. All vehicular bridges added in Norman in the future should be designed to accommodate a "shelf" for a trail, creating access for trail uses to move freely under the bridge.

Other Trail/Greenway Amenities and Considerations

Water Fountains and Bicycle Parking

Water fountains provide water for people (and pets, in some cases). Bicycle racks allow trail users to safely park their bikes if they wish to stop along the way, particularly at parks and other popular destinations.

Maps, Signage, Interpretive Installations

Comprehensive signing systems make a trail system stand out. Informational kiosks with maps at trail heads and other pedestrian generators can provide information for someone to use the trail system with little introduction – perfect for areas with high out-of-area visitation rates as well as the local citizens.

Benches

Providing benches at key rest areas and viewpoints encourages people of all ages to use the trail by ensuring that they have a place to rest along the way. Benches can be simple (e.g., wood slats) or more ornate (e.g., stone, wrought iron, concrete).

Lighting

Pedestrian-scale lighting improves safety and enables the trail to be used year-round. It also enhances the aesthetic beauty of the trail. Lighting fixtures should be consistent with other light fixtures in the city, possibly emulating a historic theme where appropriate.

Art Installations

Local artists could be commissioned to provide art for the trail system, making it uniquely distinct. Many trail art installations are functional as well as aesthetic, as they may provide areas to sit and play.

Trail Material Recommendations

The following tables represent suggested guidelines for different trail options. Trail costs and needs will vary based on the type of materials used for the trail, the number of bridges or drainage crossings that are required and the types of amenities that are included in each trail segment. Cost for materials varies from year-to-year, consequently cost projections for a typical one mile length of trail is nearly impossible to determine in advance. By using the material suggestions, shown below, an idea of material needs to project the cost is possible. As stated, this is to be used as a guiding tool; each trail will vary in cost and need depending on the topography and other requirements determined the area.

Corridor Trail - Concrete 10 Feet Wide			
Potential Development			
Description - Planned as major arterial trails 10 to 12 feet wide concrete all weather trail, centerline stripe, straight to curvilinear alignment as corridor permits. 5 to 6 inches thick concrete to allow for some use as a maintenance track. Includes some amenities at key intersection or access point nodes. Additional amenities such as shade structures and nodes can be added in the future.			
	Item	**Quantity**	**Unit**
1	Site preparation and grading allowance (per linear foot).	5,280	LF
2	Concrete trail, 5 to 6 inch depth, 10 feet wide, includes base material.	5,280	LF
3	Trail striping.	5,280	LF
4	Minor drainage pipe (12 inch d. max for local drainage only). Allowance, one per 500 linear feet.	11	EA
5	Major drainage culverts (36 inch box culvert, plan 2 per 5,000 linear feet).	TBD*	EA
6	Trail directional/safety signs (plan 1 every 500 linear feet).	10	EA
7	Intersection crosswalk striping (plan 2 roadway crossing intersection per mile).	2	Each Intersection
8	Intersection and access point accessible ramps (plan 8 at every intersection).	2	Each Intersection
9	Turf re-establishment (plan for 10 feet on either side of trail corridor).	105,600	SF
***Topography will determine need**			
Amenity Itemization			
10	Drinking fountain (1 per mile).	1	EA
11	Information kiosk (plan ratio of 2 per mile).	2	EA
12	Major trail access point sign (1 every 2,500 linear feet).	2	EA
13	Security light at access points (1 pole per access point).	4	EA
14	Bench node (2 per mile, includes bench, trash receptacle, decorative pavement).	2	EA

Parkway Sidewalk - 10 Feet Wide			
Potential Development			
Description - Major sidewalk connection through neighborhoods and commercial areas.			
	Item	**Quantity**	**Unit**
1	Grading allowance (per linear foot).	5,280	LF
2	Concrete trail, 4 to 6 inch depth, 10 feet wide, includes base material, windowpane joints for 25% of length.	5,280	LF
3	Trail centerline striping, white	5,200	LF
4	Culverts (12 inches diam. max. for local drainage only. Allowance, one every 250 linear feet.	TBD*	EA
5	Major drainage culverts (36-48 inch box culvert, plan 2 every 5,000 linear feet).	TBD*	EA
6	Trail directional/safety signs (plan 1 every 800 linear feet).	8	EA
7	Intersection crosswalk striping (plan 4 intersections per mile).	4	Each Intersection
8	Intersection and access point accessible ramps (plan 8 at every intersection).	4	Each Intersection
9	Turf re-establishment (plan for 5 feet on either side of trail corridor).	52,800	SF
***Topography will determine need**			
Amenity Itemization			
10	Drinking fountain (1 per mile).	1	EA
11	Information kiosk (plan ratio of 2 per mile).	2	EA
12	Major trail access point sign (1 every 2,500 linear feet).	2	EA
13	Security light at access points (1 pole per access point).	4	EA
14	Bench node (2 per mile, includes bench, trash receptacle, decorative pavement).	2	EA

Soft Surface Trial - 10 Feet Wide			
Potential Development			
Description - Nature trails which are built outside the floodplain zone.			
	Item	**Quantity**	**Unit**
1	Grading allowance (per linear foot).	5,280	LF
2	Soft surface trail, 4 - 6 inch depth, 10 feet wide, includes base material.	5,280	LF
3	Culverts (12 inches diam. max. for local drainage only). Allowance, one every 250 linear feet.	TBD*	EA
4	Major drainage culverts (36-48 inch box culvert, plan 2 every 5,000 linear feet).	TBD*	EA
5	Trail directional/safety signs (plan 1 every 800 linear feet).	8	EA
6	Intersection crosswalk striping (plan 4 intersections per mile).	4	Each Intersection
7	Intersection and access point accessible ramps (plan 8 at every intersection).	4	Each Intersection
8	Turf re-establishment (plan for 5 feet on either side of trail corridor).	52,800	SF
*Topography will determine need			
Amenity Itemization			
9	Drinking fountain (1 per mile).	1	EA
10	Information kiosk (plan ratio of 2 per mile).	2	EA
11	Major trail access point sign (1 every 2,500 linear feet).	2	EA
12	Security light at access points (1 pole per access point).	4	EA
13	Bench node (2 per mile, includes bench, trash receptacle, decorative pavement).	2	EA

Potential Greenway Corridors

Greenways are considered to be linear open spaces established along a corridor such as a river or railroad right–of–way, and usually developed for non-vehicular public use. Examples include the Platte River Greenway in Denver, Colorado, the Capital Area Greenway in Raleigh, North Carolina, and the Willamette Greenway in Portland, Oregon.

Preservation and access to creek and major drainage corridors – Steps should be taken to require natural creek corridor areas be preserved and trail access be allowed whenever feasible. Drainage corridors will continue to be the major trail corridors within the city, and as such should be developed with access along at least one side of the creek for small drainage tributaries and along both sides for major creeks. These corridors typically cannot be developed and therefore can preserve some of the remaining natural open space in Norman. In most cases it is preferable that streets parallel the drainage or creek corridor rather than allowing lots that back up to the creek, essentially sealing off the creek from public view or access.

Potential Neighborhood Greenway Corridors

Future neighborhood developments could highlight drainage channels and open space by making the greenways more accessible to the public. Neighborhood streets could open onto the park (Figure D-7), making it accessible for the entire neighborhood instead of creating a backyard feature for only certain residents. The roadway could parallel the greenway so that houses will face the greenway (Figure D-8). For lots that back up to greenways, the use of ornamental fences instead of solid wood privacy fences is recommended to help create a more appealing greenway environment.

A real concern of the city and the Greenbelt Commission is the location of greenways in settings where houses have backyards that extend to the creek edge or back up to the corridor. In these sensitive areas, the design and alignment of the trail must respect the privacy of land owners. Trail placement will be coordinated with the impacted property owners. If mutual solutions that respect privacy needs cannot be found then alternative trail locations must be considered.

Figure D-7

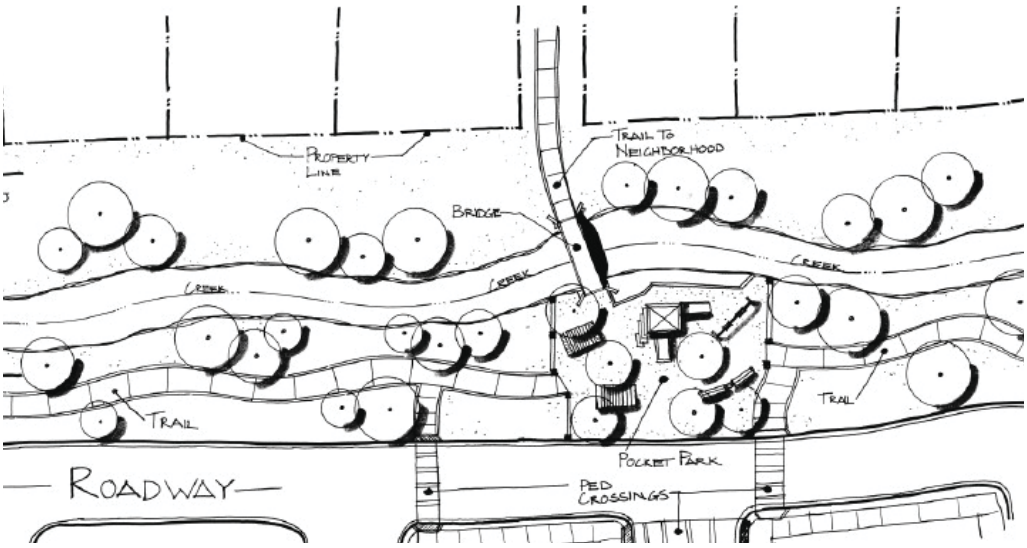
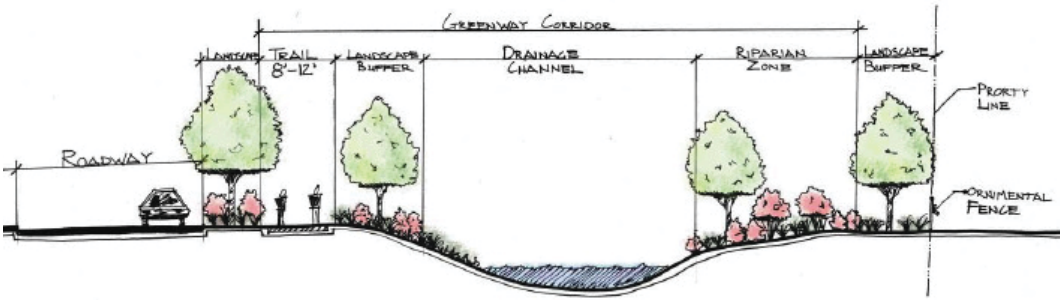


Figure D-8



SECTION 4 - IMPLEMENTATION STRATEGIES

Who Will Implement the Plan?

Norman has a social responsibility in the implementation of the Greenways Master Plan. The guidance and support by the City of Norman and its Parks Department will lead in motivating others to follow the key guidelines and implementation strategies suggested in this Plan

Key Implementers:

- *Primary responsibility* – City of Norman; Parks and Recreations Department, Public Works Department and the Greenbelt Commission,
- *All area government entities* – Including City of Norman, Cleveland County, all area school districts and other entities in the surrounding region,
- *Other city departments* – Planning & Community Development and Police Department,
- *Single purpose government entities,*
- *Business community* - Property owners, developers, commercial entities and others,
- *Community Homeowner Associations* -Acting as representatives of the residents who live in the neighborhood,
- *All Citizens of Norman* - No matter in which part of the city they live, all citizens should be involved in their community,
- *Adjacent residents in Cleveland County* -The Greenways Master Plan of Norman effects the overall greenways system, encouraging connections and building "bridges" to other adjacent systems.

Greenway Implementation Strategies

These next sections outline possible methods for acquiring greenway corridors, for funding the development of trails, and for operating and maintaining those trail corridors over time. The end result should be a readily apparent Plan and visible year by year movement towards connecting all of Norman.

The development of greenways has many benefits, greenways can set the city apart. The development of greenways reinforces a commitment to quality of life, provides alternative routes for transportation and provides health benefits. Greenways are also among the most desired and requested features by Norman's citizens. Therefore, an unwavering and active program to implement the priority corridors identified in this report should be undertaken by the City of Norman and other entities concerned with the development of Norman's greenways.

Greenway Implementation Process

The City of Norman should coordinate the following steps for implementation of the Plan. Oversight should be provided by the Greenbelt Commission, the Board of Parks Commissioners as well as the City Council.

Corridor Acquisition:

1. Determine current ownership
2. Define intent of the corridor
3. Design general width and length needed to fulfill the design
4. Project potential land acquisition cost
5. Determine method of acquisition (fee simple, easement, acquisition of development rights)
6. Acquire corridor

Preliminary Items:

1. Environmental analysis
2. Primary design
3. Possible feasibility study
4. Allocation of general construction budget
5. The City of Norman should direct the permitting process. All requirements for permits should be outlined or at a minimum reviewed by all parties involved to assure compliance and permit fee amount. (e.g. Oklahoma Department of Transportation, (ODOT), Municipal Utilities Departments (MUD's), Utility and Pipeline Companies)

Funding:

1. Research for necessary grant qualifications should be addressed
2. Acquire Council approval for grants or other funding sources
3. R-O-W issues should be addressed at this time

Design:

1. Preparation of construction documents for the design of the area
2. Specifications and cost estimates should be finalized
3. After required permits and available funding are confirmed the bidding process should begin

Permits:

1. Apply for permits with City of Norman
2. Actual construction of the project can now occur

Greenway Corridor Acquisition and/or Preservation Strategies

The permanent preservation of greenway corridors is a high priority of this Plan. Greenways must be preserved so they can absorb, contain, convey storm water and so the natural features of those corridors can be retained. However, preservation by virtue of the purchase of lands by the City of Norman should not be the only or even the most frequently used method of preservation. All property owners, development entities, homebuyers and other governmental entities in the area must be actively engaged in preserving key green areas. Now that aerial photographs and precise mapping is readily available and updated every few years it will be easy to see what is retained and what is lost. It is vital that years from now we do not look back and regret what was not preserved.

Preservation Methods

The ultimate goal of the greenway corridor should be identified before a preservation method is identified.

Preservation Only: If the intent is to preserve the natural qualities of the corridor, or to use it for drainage conveyance where frequent public access is not a consideration, then simple preservation of the greenway, along with much of its existing vegetation, may be all that is needed. In this case, easements or the purchase of development rights may be sufficient. Note that occasional access by city staff will be needed for maintenance and inspection purposes. In these cases, a high level of visibility of the corridor is still needed.

Preservation and Use as an Accessible Trail Corridor: In cases where general public access is contemplated along with preservation of the corridor, outright acquisition is preferred. In these cases, the land can be donated by the property owner as part of the development process or can be purchased by the city, assuming funding is available.

The following mechanisms should be considered for the preservation of greenway corridors.

Through Council action, move for permanent preservation of critical open space assets that are already city owned – Lands now owned by the city but not permanently designated as greenway corridors/parkland could be designated by action of the City Council.

> **Required Action** – Designate specific properties that should be preserved and pursue approval by the City Council.

Acquisition via purchase by the City of Norman – Where funding is available, corridors can be purchased by the City of Norman. The high cost of land and the scarcity of available funding make this option feasible only in a few and extraordinary cases. Appraisals should be conducted by and agreed upon by a third party.

> **Required Action** – Review current policies regarding acquisition, and adjust if necessary.

Acquisition via donation as part of the development process – Lands may be acquired by outright donation during the development process. To truly create significant greenway corridors in Norman, this must become the norm in terms of drainage corridors. The governmental entities' role in this is to govern storm water conveyance or absorption, and to maintain the dedicated green corridors.

In other cases, density bonuses may be traded for the preservation of some open space. In general, all lands within the 100-year flood zone, whether on Federal maps or on stream planning corridors should be used as a starting point for preservation. Where significant trees are not present, consideration can be given to adjustments to the floodplain in exchange for the preservation of other more valuable areas. Detailed floodplain studies by property owners, where acceptable by city staff, may also be considered as a means to adjust the edges of the 100-year flood plain.

> **Required Action** – Planning is needed during the development process to ensure that proposed donations are appropriate; acceptance of the donations as part of the zoning and platting process.

Acquisition through purchase by other entities – Local, state and national land trusts can raise funds to acquire open space, and then manage the lands or pass them on to the city.

Required Action – Policy to establish conditions under which the city would accept lands acquired in such a fashion.

Preservation by private homeowner associations – The acquisition of greenways for area residents may be considered as an alternative. Deed restrictions that permanently designate the acquisition as open space should be established. Where city funds are involved, public access to the land via trails should be provided.

Acquisition by private sources for private use – Private groups may also acquire open space with their own funding. Deed restrictions that permanently designate the acquisition as an open space should be established. Where acquisition is funded in this manner, the land may be maintained by the private source and access restrictions may be imposed. However, the open space should remain visible from publicly accessed roads and in some cases where key linkages must go through the property, trails should be considered.

Required Action – Policy to establish criteria for accessibility if necessary.

Acquisition by Cleveland County - Some open space land should be acquired by Cleveland County. Once acquired, these land can be turned over to the City to be maintained as open space preserves.

Required Action – Agreement with Cleveland County requires County to designate funding for area.

Incentives to Preserve Open Space

Allow trading of density for preservation of open space - Higher densities may be allowed through special ordinances in exchange for the preservation of open spaces over and above what is already required.

Required Action – Requires a policy change to the Zoning Ordinance, approval of changes by Council.

Allow the waiving of development fees - In exchange for open space, development fees may be waived on a case-by-case basis. While the value of this incentive is relatively small, it may still allow additional smaller pieces of open space to be preserved.

Required Action – Requires a policy change to the Subdivision Regulations, approval of changes by Council.

Conservation Easements

The use of conservation easements exploded in the 1990's, and it is estimated that over 9 million acres of privately owned lands have been preserved nationwide. Conservation easements may well replace outright acquisition as the primary tool for preservation.

The major selling point of conservation easements is their price. The cost of easements varies, but can generally cost about half as much as fee simple acquisition. The reduction in the cost of long-term management is a further benefit. Parks require annual funding for a long period of time, whereas easements are maintained by the owner who remains in place. A park is a public expense for generations to come; on an easement property, the owner bears the bulk of the maintenance costs. In particular, conservation easements have proved to be an exceptional tool in the protection of agricultural landscapes.

Acquire development rights to key properties – Prevent key properties from being developed by acquiring the development rights to each property. Conservation easements may also be used to preserve property. This technique is recommended for the preservation of farmland in key areas. Funding to acquire development rights must be identified.

Required Action – Identify a funding source to acquire conservation easements, and identify possible properties for acquisition.

Funding Sources

Funding for greenway corridor development in Norman can be generated locally, from the State of Oklahoma, as well as federally. With assistance from private development paving the way for greenway expansion, the establishment of future corridors throughout the city will accelerate.

Each corridor will have unique funding opportunities based on the specific characteristics of the neighborhoods surrounding the corridor.

Key issues associated with funding are:

Funding should be continuous and steady – Annual designations of funds for development will result in a steady growth in the city's greenways system and allow the citizens of Norman to see the continuous flow of new corridors every year, rather than in sporadic bursts.

Acquisition of land and easements and the construction of major trail and greenway corridors should be the focus of public expenditures – Major "spine" segments that connect neighborhoods should be the primary focus of public expenditures. Greenways within and primarily serving private developments and neighborhoods should be paid for with private sector funds.

Recommended Funding Sources – Within the City of Norman

From an overall standpoint, the following sources of funding should serve as the primary tools for greenway development in the city:

Portion of storm water fee for greenway implementation – A $1 per month contribution set aside from a proposed storm water fee attached to all properties containing an impervious area could generate approximately $1,000,000 in revenue per year for greenway implementation. This amount could support a $10,000,000 bond fund designated for purchasing land and rights-of–way to accelerate the development of trails.

Future capital improvement or bond funds – An annual set-aside in the city's Capital Improvement Program (CIP), leveraged annually, could be used to fund greenway development.

Private residential or commercial development – The majority of the greenways noted in this Master Plan are located within residential communities or adjacent to commercial or business areas. As such, corridors associated with either existing or new development can be partially or entirely built by the private development community. Specific mechanisms adopted by the City Council to assist greenway development are an option.

Recommended Funding Sources – Outside the City of Norman

Grants that can be used for trail development are available from a variety of sources. The remaining bond funds noted provide an ideal match for grant applications. Given the compelling local issues of traffic congestion, air quality, as well as a large local population that supports alternative transportation methods, local pursuit of grants could be successful and should be pursued aggressively.

Major types of grants include:

Federal enhancement funds – Federal transportation dollars specifically allocated to pay for transportation enhancements have become the primary funding source for trail development in the State of Oklahoma. These funds are administered by the Oklahoma Department of Transportation and, as such, trail development must conform to federal guidelines for safety and for construction procurement. The locally required match is a minimum of 20% but communities may overmatch to increase their competitive position. Funds must be reauthorized periodically by the United States Congress.

Cleveland County park and greenway development funds – For greenway corridors that have a regional benefit Cleveland County may be a future partner in developing trail areas.

Congestion Mitigation and Air Quality Grants (CMAQ) – Federal dollars that assist in relieving traffic congestion may also be used to develop trail corridors that can carry commuters to work or serve as an alternative transportation route to recreation or commercial areas.

Foundation and company grants – Some grants assist in direct funding for trail projects, and some support efforts of non-profit or citizen organizations. Further information can be found at "The Foundation Directory" and at "The Foundation Grants Index", www.fdncenter.org.

"**Grants for Greenways**" – A national listing that provides descriptions and links to groups who provide technical and financial support for greenway interests.

Partnering – Regional volunteer groups can also be helpful when constructing new greenway projects. Their efforts can be used as part of the required match for some grants. Partnerships with utility companies can often be established for the proposed utility and pipeline easement trails.

Norman volunteer programs – Assistance from schools or community groups may substantially reduce the cost of implementing some of the proposed corridor segments. Local construction companies might donate or offer discounted services or local corporations might adopt bikeways.

Implementation Strategies for Development Funded Segments

The Appendix of the Greenways Master Plan identifies numerous greenway corridors within existing and future neighborhoods. These trail segments are extremely important as the final links from neighborhoods to the city wide greenway system. Public responsibility should apply to the major greenway corridors, but the implementation of much of the greenways system requires the assistance, whether voluntary or mandated by ordinance, of the development community in Norman. The opportunity to create a true system of greenways that connects almost every neighborhood in the city can create enormous value for property and businesses in Norman, but only if it is truly city wide.

Many new neighborhoods built in Norman today include internal trail systems as an integral part of their development. Neighborhoods such as Hall Park and Summit Lake all have extensive greenways and trails that add to their value.

Requirements for greenways in new developments, governed by city ordinances, can be a key factor in speeding up the growth of a city wide greenway system. Development of a "greenway cost sharing ordinance" requiring developers to participate in the cost of greenways within their development is an option. Where appropriate the developer could widen the standard sidewalk from 5' to 10', creating a "trail" throughout their development. The additional walkable area would increase the value of the development; the developer would pay for seventy-five percent of the walkway and the city pay for the balance. Adjustments would be made for depth of lots on the side of the street with the additional walkway.

Maintenance of Greenway Corridors

Operational costs could range from $15,000 to $25,000 per mile of trail; costs will depend on the level of use, amount of area to be mowed adjacent to the trail, and whether the trail is lit for night-time use. This cost is only for trail related maintenance and does not include maintenance associated with drainage requirements, such as channel mowing.

Suggestions for keeping trails well maintained:

- Keeping a high standard of maintenance is an effective advertisement to promote the trail as a regional and state recreational resource.
- A high standard of maintenance can be an effective deterrent to vandalism, litter and encroachments
- Regular maintenance is necessary to preserve positive public relations between the adjacent land owners and managing agency.
- Constant maintenance of the trail can make enforcement of regulations on the trail more efficient. Local clubs and interest groups will take pride in "their" trail and will be more apt to assist in protection of the trail.
- A proactive maintenance policy will help improve safety along the trail.

Over the next 20 years, if 20 to 30 miles of additional trails are added, the operation impact could be expected to range from $300,000 to $750,000. Additional one-time equipment costs should be considered, such as the purchase of mowing equipment and smaller "gator" type vehicles to access more difficult terrain. In most cases, trails should be designed to be accessed by a typical sized truck for general maintenance.

Vegetation – In more rural environments the maintenance of the trail can be minimal, if any at all. Some areas will remain as natural as possible for drainage purposes.

Where an active trail is present plantings/vegetation should be placed far enough apart to maintain visibility and avoid creating the feeling of an enclosed space. This will also give trail users a good, clear view of their surroundings which enhances the aesthetic experience of the trail. Under-story vegetation within most trail rights-of-way should not be allowed to grow higher than 36", except in cases where the under-story is natural, desirable, and part of the habitat required for wildlife. Tree species should be selected so as to minimize the roots uplifting of pavement, if present, as well as minimize vegetative litter on the trail. Vertical clearance along the trail should be periodically checked, and any overhanging branches should be pruned to a minimum vertical clearance of 10'.

Surfacing – Where concrete is the recommended surface material, cracks, ruts, and water damage will need to be repaired periodically.

Where drainage problems exist along the trail, ditches and drainage structures will need to be kept clear of debris to prevent washouts along the trail and maintain positive drainage flow. Checks for erosion along the trail should be made during the wet season and immediately after any storm that brings flooding to the area. Use of trails with natural soft surfaces should be minimized and/or prohibited during wet conditions.

The trail surface should be kept free of debris, especially broken glass and other sharp objects, loose gravel, leaves, and stray branches. Trail surfaces should be swept periodically. Soft shoulders should be well maintained to maximize their usability.

Litter and illegal dumping – Staff or volunteers should remove litter along the trail. Litter receptacles should be placed at access points such as trailheads.

Illegal dumping should be controlled by vehicle barriers, regulatory signage and fines. When littering does occur, it should be removed as soon as possible in order to prevent further dumping. Neighborhood volunteers, community groups, alternative community service crews should be considered in addition to maintenance staff for clean-up services.

Signage - Signage should be installed and replaced along the trail on an as-needed basis.

Maintenance of Trails – Estimated Needs

All maintenance of materials suggested below is per mile, per year. These timelines and materials are approximate. The requirements will vary based on specific physical conditions and the desired level of maintenance within each trail area.

Table F - 1	
Potential Annual Trail Maintenance Needs	
Maintenance Item	**Frequency**
Concrete Trail Maintenance	
Pavement sweeping	Bi-weekly / As needed
Shoulder & grass mowing/weed control	Weekly / Monthly as needed
Trash disposal	Weekly / As needed
Watering	Weekly / As needed
Plant trimming	Monthly / As needed
Drainage cleaning	Annually
Lighting repair	Annually
Furnishing repair	Annually
Telephone, drinking fountain, irrigation repair	Annually
Sign replacement	1 - 3 years
Pruning	1 - 4 years
Pavement repairs	5- 15 years
Special maintenance: mud removal, fallen trees, debris, graffiti removal	As needed (assumes average of three times annually)
Trail replacement (anticipated)	Concrete 15 to 30 year replacement cycle
Asphalt Trail Maintenance	
Debris removal	Weekly / As needed
Shoulder and mowing / weed control	Weekly / Monthly as needed
Trash disposal	Weekly / As needed
Watering	Weekly / As needed
Plant trimming	Monthly / As needed
Drainage cleaning	Annually / As needed
Lighting repair	Annually
Furnishing repair	Annually
Sign replacement	1 - 3 years
Pruning	1 - 4 years
Surfacing patching / rolling	Monthly
Special maintenance: mud removal, fallen trees, debris, graffiti removal	As needed (assumes average of three times annually)
Trail replacement (anticipated)	Asphalt 5 to 10 year replacement cycle

Table F - 1 Continued	
Potential Annual Trail Maintenance Needs	
Maintenance Item	**Frequency**
Soft Surface Trail Maintenance	
Debris removal	Weekly / As needed
Shoulder and mowing / weed control	Weekly / Monthly as needed
Trash disposal	Weekly / As needed
Watering	Weekly / As needed
Shrub trimming	Monthly / As needed
Drainage cleaning	Yearly / As needed
Lighting repair	Yearly
Furnishing repair	Yearly
Sign replacement	1 - 3 years
Pruning	1 - 4 years
Erosion patching / trail raking	Monthly
Special maintenance: mud removal, fallen trees, debris, graffiti removal	As needed (assumes average of three times annually)
Trail material enrichment (anticipated)	Crushed rock 2 to 5 year replacement cycle
Bridge & Tunnel Inspection	
Trash disposal	Weekly / As needed
Sweeping / Debris removal	Weekly / As needed
Drainage cleaning	Annually / As needed
Lighting repair	Annually
Emergency phone repair	Annually
Safety Education	
School / Adult education programs	$15,000 annually
Brochures / Update as needed	$5,000 annually
Community Programs	
Community awareness programs	$5,000 annually
Bicycle events	$5,000 annually
Trails coordinator	$40,000 annually

Table F - 2	
Life Cycle Comparison	
Type of Trail Surface	Projected Trail Replacement Cycle
Concrete surface (5" minimum thickness)	15 to 30 year life span with proper base and protection from drainage and vegetation
Asphalt surface (2" overlay)	5 to 10 year life span with proper base, but requires considerable patching and periodic rolling. Water penetration can cause quick deterioration
Crushed granite surface	2 to 5 year replacement on a continuous basis through replenishment of the crushed granite. Quick repair of eroded areas is critical to slow deterioration of the trail

Implementation Timeframe 2011-2030

The overall recommendations of this Greenways Master Plan are estimated to take up to 20 plus years to complete.

The following sequence is recommended to implement the Greenways Master Plan:

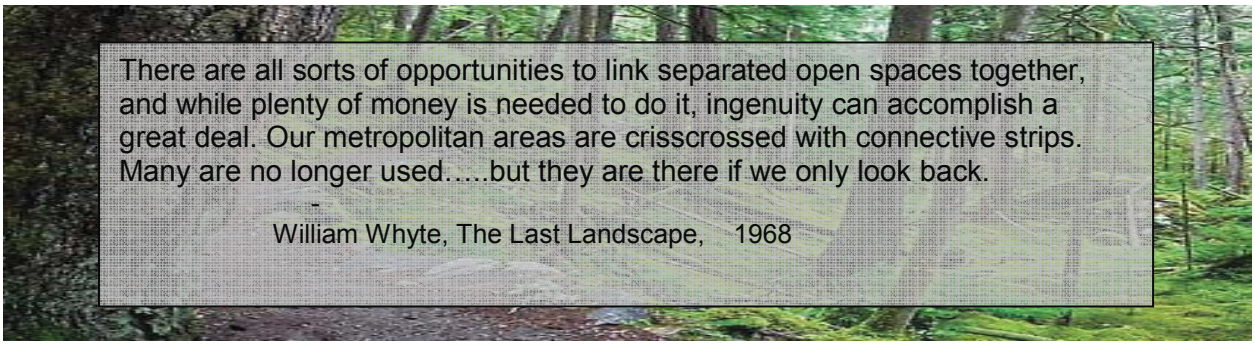
Consider acquisition of greenway corridors as the highest priority for this Plan – Connectivity of the city remains the highest priority of this Plan, to accomplish this access, greenway corridors must be acquired. Creek corridors can be acquired through outright purchase or through access easement. Once a tract of land is developed, it is extremely difficult to acquire land or easements for greenway corridors and trails.

Consider embarking on an extensive trail development schedule over the next 10 years – Norman continues to grow at a steady rate, and demand for quality of life features such as greenways and trails will only grow. It is while the city is growing that it is the easiest time in which to develop trails.

Develop strategies to work with private sector development – Voluntary and mandatory processes to work with private development should be developed to not miss any opportunities to implement trail segments.

Review and update the citywide greenways plan – Implementation of a master plan is a long-term process. In the next several decades the city will experience a constant need to adapt to growth and change. In order to accommodate these changes, this Plan should be viewed as a working document and if possible should be reviewed and updated at the same time as The Norman Parks & Recreations Master Plan is reviewed and updated, promote continuity between the two plans. If simultaneous review is not possible, then an update to the Plan every five to ten years should occur to ensure continued support and improvement and enhancement of the designated trails, corridors and open spaces within the city.

Adoption of this Greenways Master Plan

The adoption of this Plan will complete a very long process, a process which has given the opportunity for comment from a variety of sources. Sources such as citizens, professional staff, Boards and Commissions, those comments have been collected here in this document. Several different methods of gauging public sentiment were used, including public meetings and formal public hearings. The goals, ideas and suggestions were compiled here with the objective of creating an enjoyable open space and trails for residents.

The adoption of this Plan and its recommendations reflect the broad sense of participation and ownership for our city. Positive support of this Plan will help ensure that the development of trails, corridors and open space remains a priority.