

**CITY COUNCIL CONFERENCE**

**MUNICIPAL BUILDING CONFERENCE ROOM  
201 WEST GRAY, NORMAN, OK**

**JANUARY 26, 2016**

**5:30 P.M.**

- 1. CHANGE ORDER NO. ONE TO CONTRACT K-1516-43 WITH MCKEE UTILITY CONTRACTORS, INC. INCREASING THE CONTRACT AMOUNT BY \$410,205 TO ADD THE REHABILITATION OF THE FULL WEST LANE OF BERRY ROAD TO THE BERRY ROAD WATER LINE REPLACEMENT PROJECT, PHASE 2.**
- 2. UPDATE ON THE UNIVERSITY NORTH PARK TRAFFIC IMPACT STUDY AND THE I-35 TRAFFIC CORRIDOR STUDY BETWEEN 4TH STREET IN MOORE AND ROBINSON STREET IN NORMAN.**



# City of Norman, OK

Municipal Building  
Council Chambers  
201 West Gray  
Norman, OK 73069

## Master

**File Number: K-1516-43 CO1**

<b>File ID:</b> K-1516-43 CO1	<b>Type:</b> Contract	<b>Status:</b> Consent Item
<b>Version:</b> 1	<b>Reference:</b> Item 16	<b>In Control:</b> City Council
<b>Department:</b> Utilities Department	<b>Cost:</b> \$410,205.00	<b>File Created:</b> 01/06/2016
<b>File Name:</b> Change Order to Contract for Berry Road Water Line Phase 2		<b>Final Action:</b>

**Title:** CHANGE ORDER NO. ONE TO CONTRACT K-1516-43: BY AND BETWEEN THE CITY OF NORMAN, OKLAHOMA, THE NORMAN UTILITIES AUTHORITY, AND MCKEE UTILITY CONTRACTORS, INC. INCREASING THE CONTRACT AMOUNT BY \$410,205 FOR A REVISED CONTRACT AMOUNT OF \$1,616,228.50. TO ADD THE REHABILITATION OF THE FULL WEST LANE OF BERRY ROAD TO THE BERRY ROAD WATER LINE REPLACEMENT PROJECT, PHASE 2.

**Notes:** ACTION NEEDED: Acting as the City Council and Norman Utilities Authority, motion to approve or reject Change Order No. One to Contract K-1516-43 with McKee Utility Contractors, Inc., increasing the contract amount by \$410,205 for a revised contract amount \$1,616,228.50; and authorize the execution thereof.

ACTION TAKEN: \_\_\_\_\_

**Agenda Date:** 01/26/2016

**Agenda Number:** 16

**Attachments:** Text File McKee Change Order, Change Order 1 signed, Purchase Requisition

**Project Manager:** Jim Speck, Capital Projects Engineer

**Entered by:** jim.speck@normanok.gov

**Effective Date:**

### History of Legislative File

Ver- sion:	Acting Body:	Date:	Action:	Sent To:	Due Date:	Return Date:	Result:
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### Text of Legislative File K-1516-43 CO1

Body

**BACKGROUND:** For many years, the Norman Utilities Authority (NUA) has contemplated replacement of the 14-inch cast iron waterline along Berry Road from Robinson to Lindsey. This waterline was installed in the early 1940's when North Base was a military facility; the waterline is in very poor condition resulting in lost water from numerous repairs, damage to the overlying roadway and inconveniences to the traveling public and the surrounding neighborhood. Similarly, the University of Oklahoma (OU) owns a 14-inch cast iron waterline generally along the east side of Berry Road from Robinson to Lindsey and then east along the north side of Lindsey to Chautauqua. Numerous repairs to the OU waterline have also occurred causing further disruption to the neighborhood.

Staff coordinated with OU to allow the 14-inch waterline owned by both entities to be constructed parallel and

directly adjacent to each other and bid as one project to reduce inconvenience to the public and achieve some cost savings through reduced excavation and reduced width of pavement repairs. The waterline improvements will be managed and paid by each entity under separate contract with the same contractor.

The Berry Waterline Replacement project (WA/WB0305) has been funded by the NUA and is expected to include 10,200 linear feet (LF) of 16-inch waterline along the west side of Berry Road from Robinson to Lindsey and approximately 2600 LF of 24-inch waterline east along Lindsey to Chautauqua where it will connect to the 16-inch Lindsey Waterline project completed in 2005. The 24-inch portion is part of an ongoing effort to upgrade the City's water distribution system as a continuation of the Segment D Waterline which is included in Phase 1. Phase 2 includes the section from Avondale to north of Main Street with Phase 3 consisting of the section from Main to Robinson.

On May 10, 2011, the NUA approved Amendment No. 1 to Contract K-0910-61 authorizing Poe & Associates (Poe) to perform field surveying, preliminary design, final design and limited construction management services for the Berry Waterline Replacement for a total contract price of \$172,000.

On March 10, 2015, the NUA approved Contract K-1415-70 with Central Contracting Services, Inc. for the construction of Phase 1 of the Berry Road Waterline Replacement project. Phase 1 construction was completed on August 24, 2015.

On September 22, 2015, the NUA approved Contract K-1516-43 with McKee Utility Contractors, Inc. (McKee) in the amount of \$1,206,023.50 for the construction of Phase 2 of the Berry Road Waterline Replacement project.

**DISCUSSION:** The project had originally planned to remove and replace approximately two-thirds (2/3) of the west lane of Berry Road for the installation of two 16-inch waterlines. The waterline replacement is a coordinated effort between the NUA and OU to replace waterlines operated by each entity.

During the bidding process for the Phase 2 section, the City of Norman Public Works Department (City) expressed a desire to broaden the pavement removal and replacement to include the full west lane of Berry Road. This allows the City to achieve significant cost savings for permanent repairs to the west lane of Berry Road. To allow the Public Works Department to be a part of the paving project, an amendment to the contract and a change order adding the project are required. Since the City of Norman is a separate entity from the Norman Utilities Authority, an amendment to the contract adding the City of Norman as a funding source is being submitted as a separate item on this agenda. This item is the change order for the additional work.

The change order includes approximately 3,000 square yards of concrete pavement to install the remaining one-third of the western lane of Berry Road and other necessary bid items to complete the work. The additional work will be paid at the unit prices established in the original contract and will be funded by the Urban Asphalt Pavement Rehabilitation project. The Fiscal Year Ending (FYE) 2016 budget for the FYE15 Urban Asphalt Pavement Rehabilitation project has an unencumbered balance of \$727,506 in Construction (account 050-9401-431.61-01; project BP0246). Adequate funds are available to fund Change Order No. 1 project in the amount of \$410,205.

**RECOMMENDATION:** It is recommended that the City of Norman approve Change Order #1 to contract K-1516-43 with McKee Utility Contractors, Inc. increasing the contract amount by \$410,205 for a revised contract amount of \$1,616,228.50. Funds from the FYE Urban Asphalt Pavement Rehabilitation project construction (account 050-9401-431.61-01; project BP0246) will be utilized to pay for the increase in the contract amount.

CHANGE ORDER SUMMARY  
CITY OF NORMAN  
CLEVELAND COUNTY, OKLAHOMA

CHANGE ORDER NO.: 1

Date: December 22, 2015

CONTRACT NO.: K-1516-43

PROJECT: Berry Road Waterline Project Phase 2

PROJECTS NOS.: WA0305

CONTRACTOR: McKee Utility Contractors, Inc.  
2319 W. Main Street  
Praque, OK 74864

ORIGINAL CONTRACT AMOUNT: \$ 1,206,023.50

(Increase) this change order \$410,205.00

DESCRIPTION	DECREASE	INCREASE
See Page 3 – Change Order Detail	-0-	\$410,205.00

Note: This change order is based completely on the unit bid prices from the original contract.

NET CHANGE	\$410,205.00
REVISED CONTRACT AMOUNT	\$ 1,616,228.50

CONTRACTOR: McKee Utility Contractors Inc.

DATE: 12/30/2015

PROJECT MGR.: Jim M. McKee President

DATE: 12/30/2015

CITY ATTORNEY: \_\_\_\_\_

DATE: \_\_\_\_\_

ACCEPTED BY: \_\_\_\_\_

DATE: \_\_\_\_\_

(Mayor)

CHANGE ORDER DETAIL  
CHANGE ORDER NO. 1  
City of Norman  
Cleveland County, Oklahoma

Contract No.:	K-1516-43	Project Mgr.: Jim Speck
Project Account Number:	031-9521-462.61-01	Capital Projects Engineer
Project No. WA0305		P.O. Box 370
		405-366-5443

Change Order No. 1 Applies To:  
BERRY ROAD WATERLINE PROJECT PHASE 2

- S. Change Orders or addenda to public construction contracts of One Million Dollars (\$1,000,000.00) or less shall not exceed a fifteen percent (15%) cumulative increase in the original contract amount.
- B. Change orders or addenda to public construction contracts of over One Million Dollars (\$1,000,000.00) shall not exceed the greater of One Hundred Fifty Thousand Dollars (\$150,000.00) or a ten percent (10%) cumulative increase in the original contract amount.
- C. Change orders or cumulative change orders which exceed the limits of subsection A or B of this section shall require a readvertising for bids on the incomplete portions of the contract.
- G. 1. All materials with cost per item;  
2. Itemization of all labor with number of hours per operation and cost per hour;  
3. Itemization of all equipment with the type of equipment, number of each type, cost per hour for each type, and number of hours of actual operation for each type.  
4. Itemization of insurance cost, bond cost, social security, taxes, workers' compensation, employee fringe benefits and overhead cost; and  
5. Profit for the contractor.
- H. 1. If a construction contract contains unit bid pricing, and the change order pertains to the unit bid price, the change order will not be subject to subsection A or B of this section.  
2. When the unit price change does not exceed Ten Thousand Dollar (\$10,000.00), the unit price change order computation may be based on an acceptable unit price basis in lieu of cost itemization as required in paragraphs 1,2,3,4 and 5 of subsection G of this section.
- S. Alternates or add items bid with the original bid and contained in the awarded contract as options of the awarding public agency shall not be construed as change orders under the provisions of the Public Competitive Bidding Act of 1974.

DETAILED COST ITEMIZATION

ORIGINAL CONTRACT:

BERRY ROAD WATERLINE PROJECT PHASE 2

CHANGE ORDER NO. 1 to Contract No. K-1516-43  
 Applied To: Project Nos.: WA0305

Streets:

PROJ #	STREET
WA0305	Berry Road Waterline Project Phase 2

Original Bid Proposal and Pay Item Numbers

MCKEE UTILITY CONTRACTORS, INC.					
BERRY ROAD WATERLINE PROJECT PHASE 2					
BID 1516-9					
ITEM	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL PRICE
38	Removal/Replacement of Existing High-Early P.C. Concrete Pavement	SY	\$125.00	3,000 SY	\$375,000.00
40	Removal and Replacement of Concrete Curb & Gutter	LF	\$25.00	100 LF	\$2,500.00
41	Removal and Replacement of Existing Handicap Ramp	EA	\$125.00	4 EA	\$500.00
49	ODOT Type "A" Aggregate	TN	\$.01	500 TN	\$5.00
50	8-Inch Dowel Basket	LF	\$7.00	4600 LF	\$32,200.00
	TOTAL INCREASE				\$410,205.00



# City of Norman



## Traffic Impact Study for University North Park Addition – Phase B

JANUARY 26, 2016





# Project History - Timeline

- **I-35 @ W Robinson Interchange (West Side)**
  - Original contract approved on November 13, 2012
  - Presented findings to Community Planning and Transportation Committee on September 30, 2013
  - Presented findings to UNP TIF Oversight Committee on October 15, 2013
  - Final Report submitted in March 2014.
- **UNP TIA Validation Study**
  - Original contract approved on July 29, 2014 for Phase A services
  - Phase A report submitted January 23, 2015
  - Phase A presented to City Council Study Session on March 31, 2015
  - Phase B draft report submitted August 21, 2015



**I-35 at W Robinson Street**

Final Report  
Norman, OK



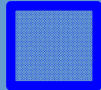
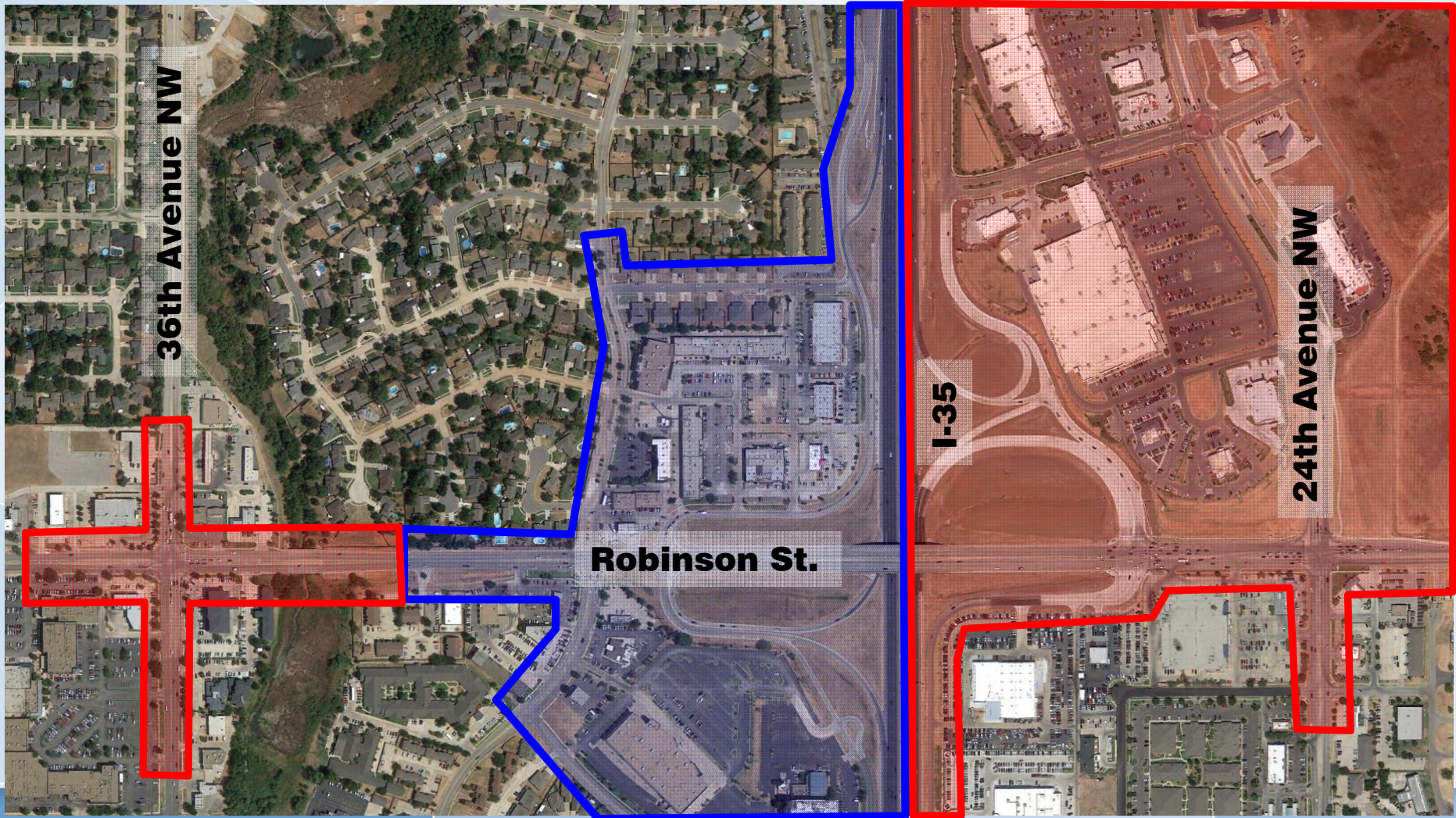
Prepared For:  
**The City of Norman**  
March, 2014







# Project History: I-35 at Robinson



**Primary Study Area**



**Secondary Study Area**



# Project History: I-35 at Robinson

- Initial 2035 Projections with 100% UNP
- Relied on assumptions for UNP from prior studies (2002-2008)
- 2025 Projections (50% remaining UNP) after assessing impact
- Considered 7 initial concepts for west side of interchange
- Selected alternative to handle 2025 demand
- Recommended additional concepts to meet 2035 demand outside study area

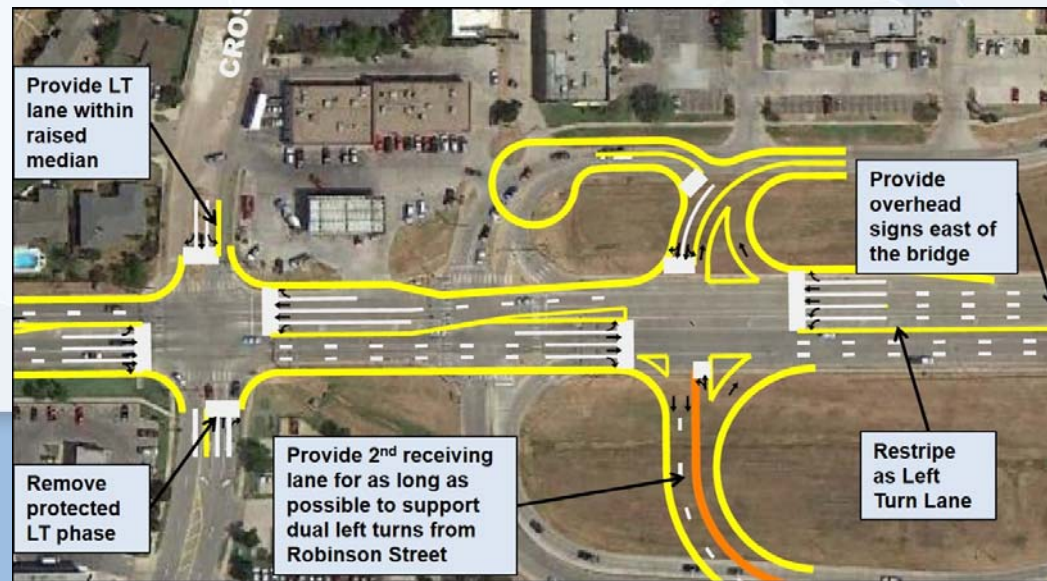




# Project History: I-35 at Robinson



- Cost: \$4.5 Million
- Good 2025 Performance
- 2035 AM okay, 2035 PM poor





# Project History: UNP Phase A

- Results of initial study showed significant 2035 congestion on Robinson east side of interchange
- City asked Garver to study full build out of UNP across larger study area
- Phase A study
  - Existing Conditions (Fall 2014)
  - Trip Generation for full UNP (2035)
  - Assessment of existing network and existing plus committed network (2035)
- Phase B study
  - Alternative Testing
  - Conceptual Layouts





# Project History: UNP Phase A

- Existing Conditions showed some congestion at key bottlenecks
  - Robinson @ I-35 W, Tecumseh @ I-35 W, Robinson @ 24<sup>th</sup>, Tecumseh @ Flood

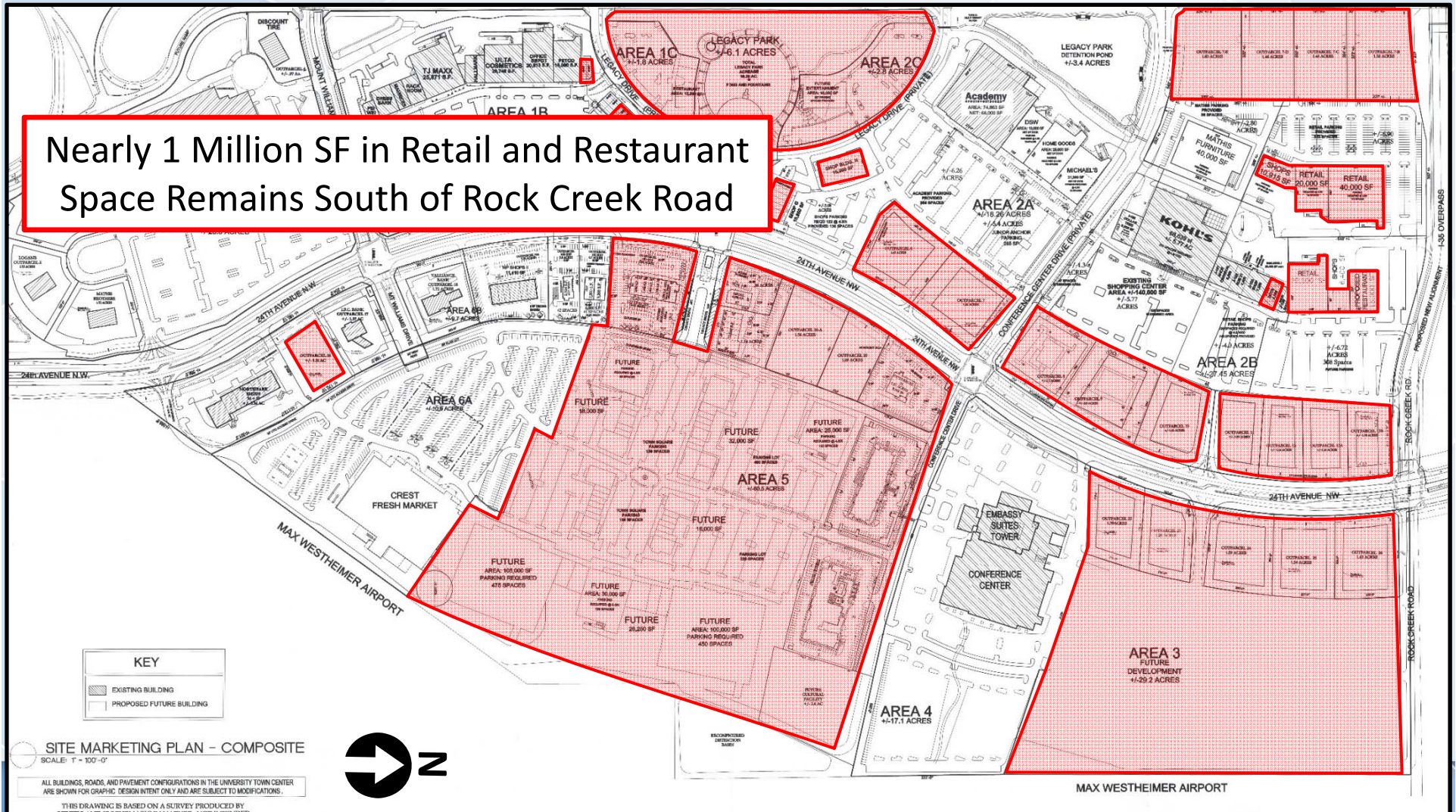


- Phase A concluded significant congestion throughout study area due to future growth of the UNP with the E+C Network
- Phase B included a few updates to the Phase A work
  - Refinement to internal driveway assumptions
  - Slight updates to land use square footages



# Remaining Parcels - South UNP

Nearly 1 Million SF in Retail and Restaurant Space Remains South of Rock Creek Road





# Two Land Use Plans - North UNP

## Current Land Use Plan

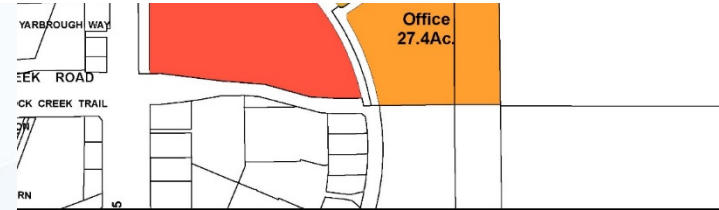


## Modified Land Use Plan



Land Use Plan	Quadrant	Land Use			
		Industrial	Retail / Restaurant	Office	Multi-Family
Current Land Use	NE Quadrant	63,000 SF	-----	910,000 SF	-----
	NW Quadrant	289,000 SF	-----	-----	1,296 Units
Modified Land Use	NE Quadrant	30 Acres	-----	481,730 SF	1,092 Units
	NW Quadrant <sup>1</sup>	27 Acres	476,791 SF	---	-----

<sup>1</sup>Hotels (300 rooms) and outparcel land uses such as a gas station and car wash were assumed for the NW Quadrant as well



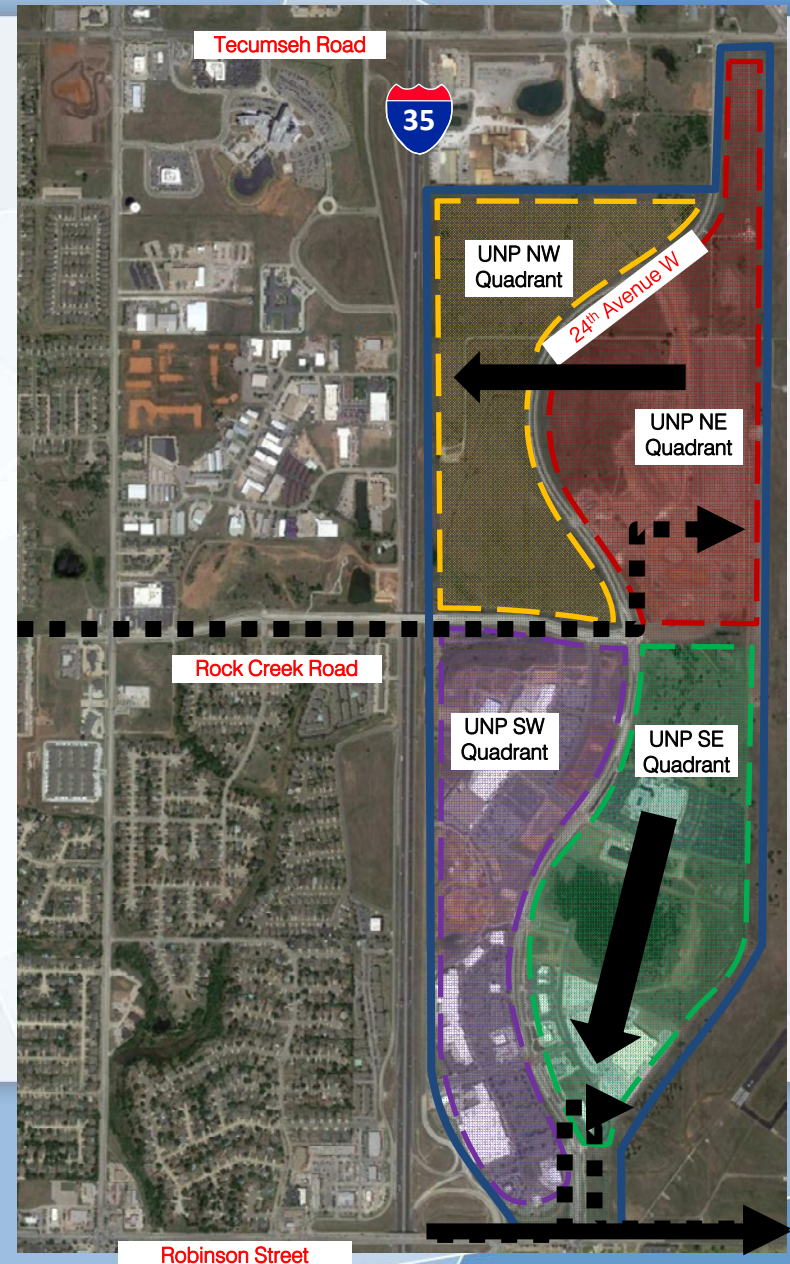
University North Park  
Land Use Map





# Trip Generation Methodology

- Types of Trips
  - Internal Trips
    - Interaction varies on different land use intensity (Office, Retail, Restaurant, Residential, Hotel, Entertainment)
    - Internal Quad and Quad to Quad
  - Primary trips
  - Pass-By / Diverted Link Trips
- Multiple Trip Distribution Patterns
  - South side development
  - North side development
  - Internal Capture and Pass-By







# Trip Generation Totals

## Current Land Use Plan

Trip Type	Daily			AM			PM		
	Total	Entering	Exiting	Total	Entering	Exiting	Total	Entering	Exiting
<b>Gross Trips</b>	80,194	40,097	40,097	4,876	2,908	1,967	7,681	3,605	4,075
<b>Total Internal Capture Trips</b>	25,835	12,917	12,917	1,348	673	674	2,653	1,325	1,327
<b>Total IC - Internal Quad Capture</b>	12,046	6,023	6,023	314	158	156	1,143	571	572
<b>Total IC - Quad to Quad</b>	13,788	6,894	6,894	1,034	516	519	1,510	755	755
<b>Total External Trips</b>	54,359	27,180	27,180	3,528	2,235	1,293	5,028	2,280	2,748
<b>Total Pass-By / Diverted Link Trips</b>	16,981	8,490	8,490	703	352	352	1,365	683	683
<b>Total Primary Trips</b>	37,379	18,689	18,689	2,825	1,883	941	3,663	1,597	2,065

## Modified Land Use Plan

Trip Type	Daily			AM			PM		
	Total	Entering	Exiting	Total	Entering	Exiting	Total	Entering	Exiting
<b>Gross Trips</b>	112,783	56,392	56,392	5,862	3,444	2,418	10,446	5,071	5,375
<b>Total Internal Capture Trips</b>	30,595	15,297	15,297	1,323	662	661	3,041	1,520	1,521
<b>Total IC - Internal Quad Capture</b>	18,066	9,033	9,033	565	283	282	1,706	853	853
<b>Total IC - Quad to Quad</b>	12,529	6,264	6,264	758	379	379	1,335	667	668
<b>Total External Trips</b>	82,188	41,094	41,094	4,539	2,782	1,757	7,405	3,551	3,854
<b>Total Pass-By / Diverted Link Trips</b>	28,301	14,151	14,151	1,122	561	561	2,377	1,189	1,189
<b>Total Primary Trips</b>	53,887	26,943	26,943	3,417	2,221	1,196	5,028	2,362	2,665



# 2035 Traffic Projections

- Developed 2035 volumes for the study area
  - 2014 Traffic + Nominal Background Growth
    - Excluded all direct UNP movements
  - Assumed Base Driveway Connections on UNP North
  - Shifted for Interstate Drive / Corporate Centre Drive Extension
  - Applied UNP trips and trips from Legacy Business Park

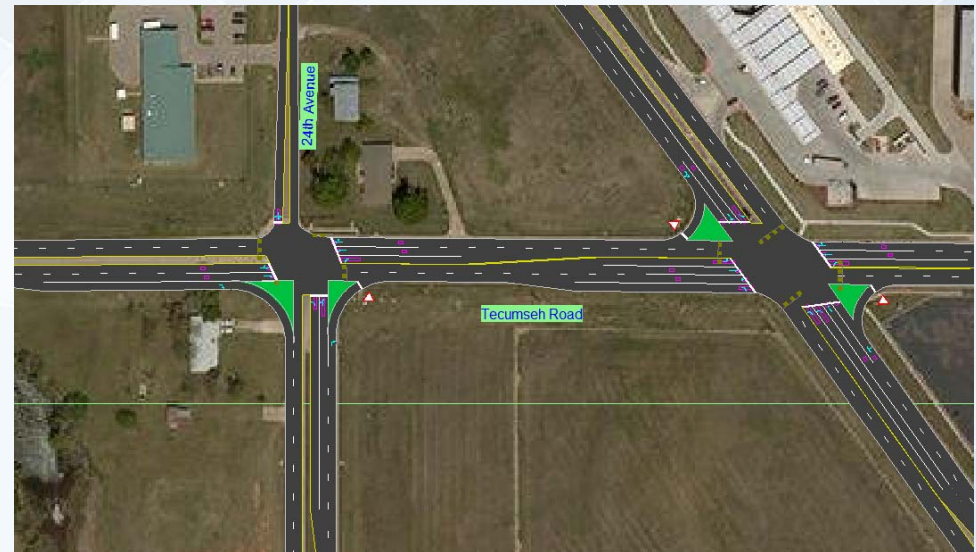
## Projected Traffic Volumes at External Access Points to UNP (2014/2035)

Segment	2014 Existing	2035 Current Land Use	2035 Current Land Use w/ RC Interchange	2035 Modified Land Use	2035 Modified Land Use w/ RC Interchange
24th Ave N of Robinson Street	20,340	41,543	35,855	49,472	43,530
Interstate Drive N of I-35 Ramps	1,800	11,429	5,562	14,017	7,085
24th Ave S of Tecumseh Road	7,500	23,992	19,467	35,802	27,886
Rock Creek Road at I-35 overpass	5,000	15,236	30,331	20,740	40,542



# E+C Network

- Committed Improvement Projects
  - Robinson Street at I-35 interchange (West)
  - Tecumseh Road at Flood Avenue
  - Tecumseh Road at 24<sup>th</sup> Avenue NW
  - Extension of Interstate Drive to Corporate Drive
  - Base Lane Configuration at Development Driveways
  - Restriping / Phasing Updates





# E+C Results

- Capacity Analysis Results
  - Major Capacity Issues for Both Land Use Plans
    - Delay per Vehicle
      - 2035 Current Land Use Plan: Delay increases by factor of 3.5 to 5.0 over 2014
      - 2035 Modified Land Use Plan: Delay increases by factor of 3.9 to 7.4 over 2014
  - Interstate 35 will fail in 2035



# E+C Results





# 2035 Analysis Options

- **Networks Analyzed (Macro/Micro LOS results)**
  - Existing + Committed (E+C) Projects – Baseline
  - Arterial Improvements Only – Current Land Use
    - No bridge widening at Robinson, Tecumseh interchanges
  - Arterial Improvements Only – Modified Land Use
    - Bridge widening at Robinson, Tecumseh interchanges
  - Interchange at Rock Creek + Arterial Improvements – Current Land Use
    - Three interchange configurations considered
    - Arterial improvements not as extensive
  - Interchange at Rock Creek + Arterial Improvements – Modified Land Use
    - Three interchange configurations considered
    - Arterial improvements not as extensive (no interchange bridge widening)



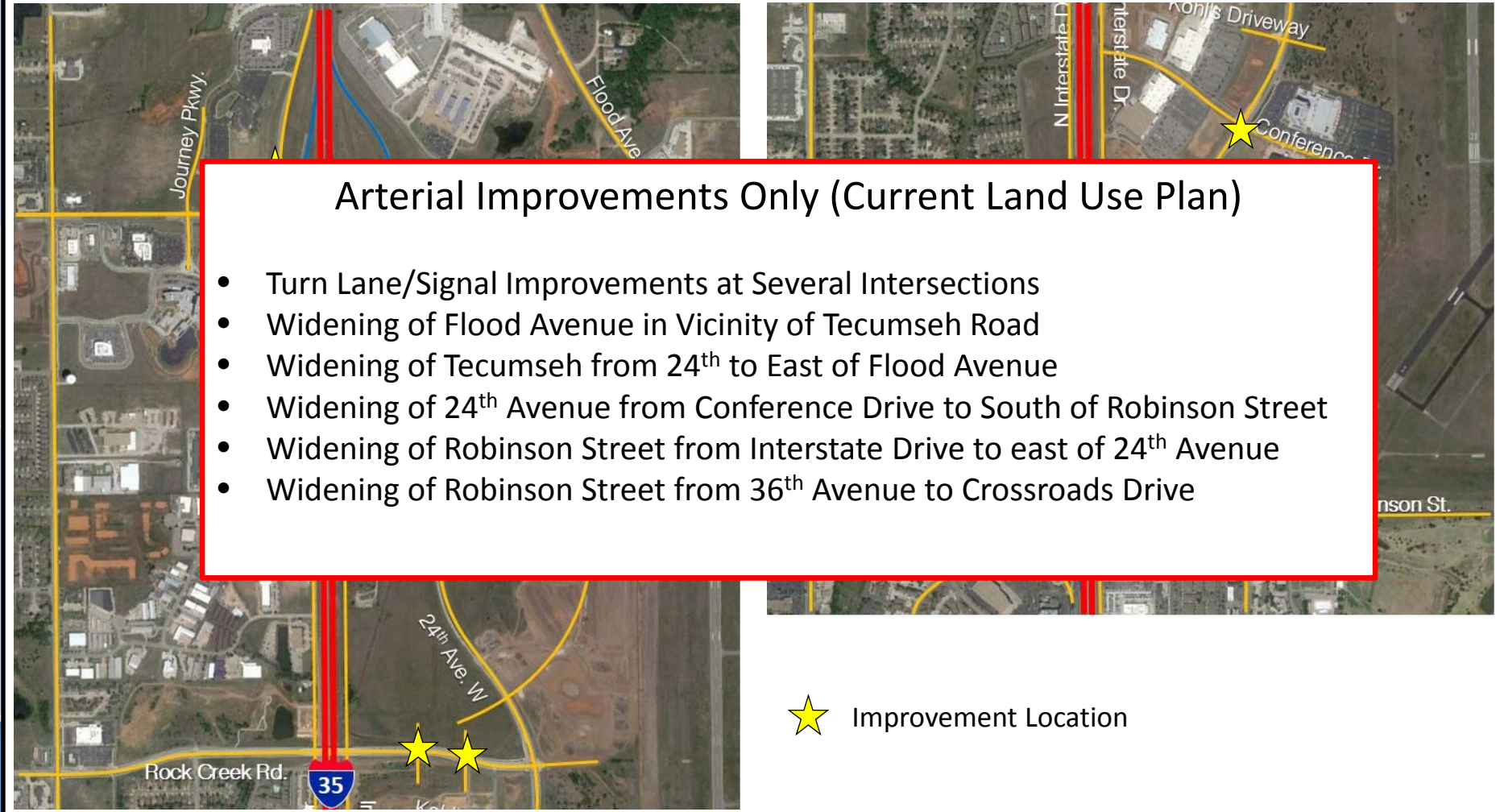
# Current LU – Arterial Imp Only



★ Improvement Location



# Current LU – Arterial Imp Only







# Current LU – Arterial Imp Only

- Capacity Analysis Results
  - Current Land Use Plan
    - Improvements bring delay to moderate level
    - No bridge widening required
    - Overall delay levels are within 1.0 to 1.5 the 2014 totals
  - Modified Land Use Plan
    - AM peak period at moderate level
    - PM peak period – delay level at 2.0 to 2.5 the 2014 totals
      - Robinson @ 24<sup>th</sup>, Tecumseh @ Flood, Tecumseh @ N Interstate Drive are severely congested



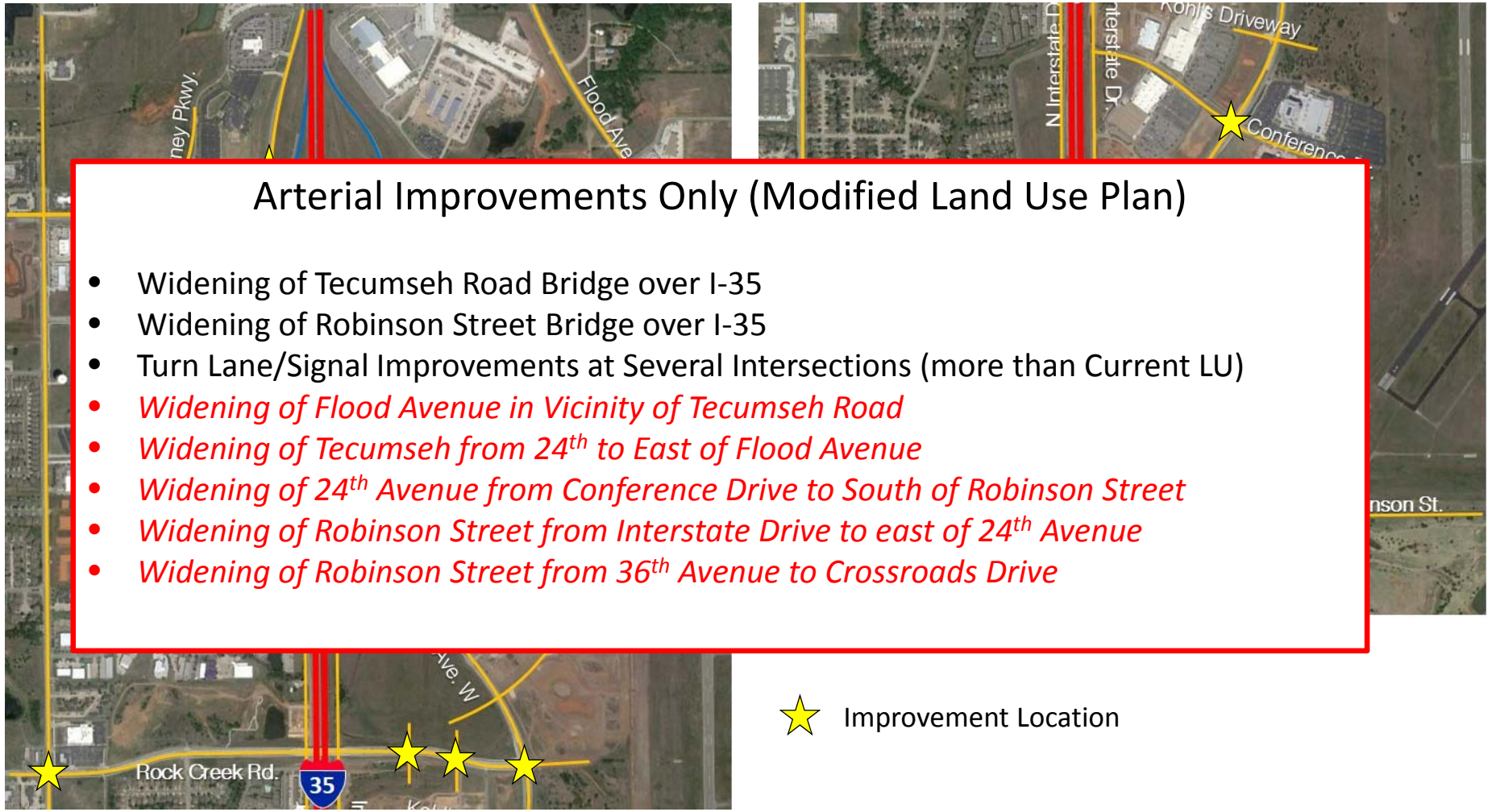
# Modified LU - Arterial Imp Only



★ Improvement Location



# Modified LU – Arterial Imp Only



## Arterial Improvements Only (Modified Land Use Plan)

- Widening of Tecumseh Road Bridge over I-35
- Widening of Robinson Street Bridge over I-35
- Turn Lane/Signal Improvements at Several Intersections (more than Current LU)
- *Widening of Flood Avenue in Vicinity of Tecumseh Road*
- *Widening of Tecumseh from 24<sup>th</sup> to East of Flood Avenue*
- *Widening of 24<sup>th</sup> Avenue from Conference Drive to South of Robinson Street*
- *Widening of Robinson Street from Interstate Drive to east of 24<sup>th</sup> Avenue*
- *Widening of Robinson Street from 36<sup>th</sup> Avenue to Crossroads Drive*

★ Improvement Location



# Modified LU – Arterial Imp Only

- Capacity Analysis Results
  - Modified Land Use Plan
    - AM peak period delay remains at moderate level
    - Improvements bring PM operations to more manageable level (approximately 2.1 factor of current delay)
      - Interchanges work well
      - Robinson @ 24<sup>th</sup>, Tecumseh @ Flood still heavily congested even with improvements



# Modified LU – Arterial Imp Only

- Capacity
- Modified
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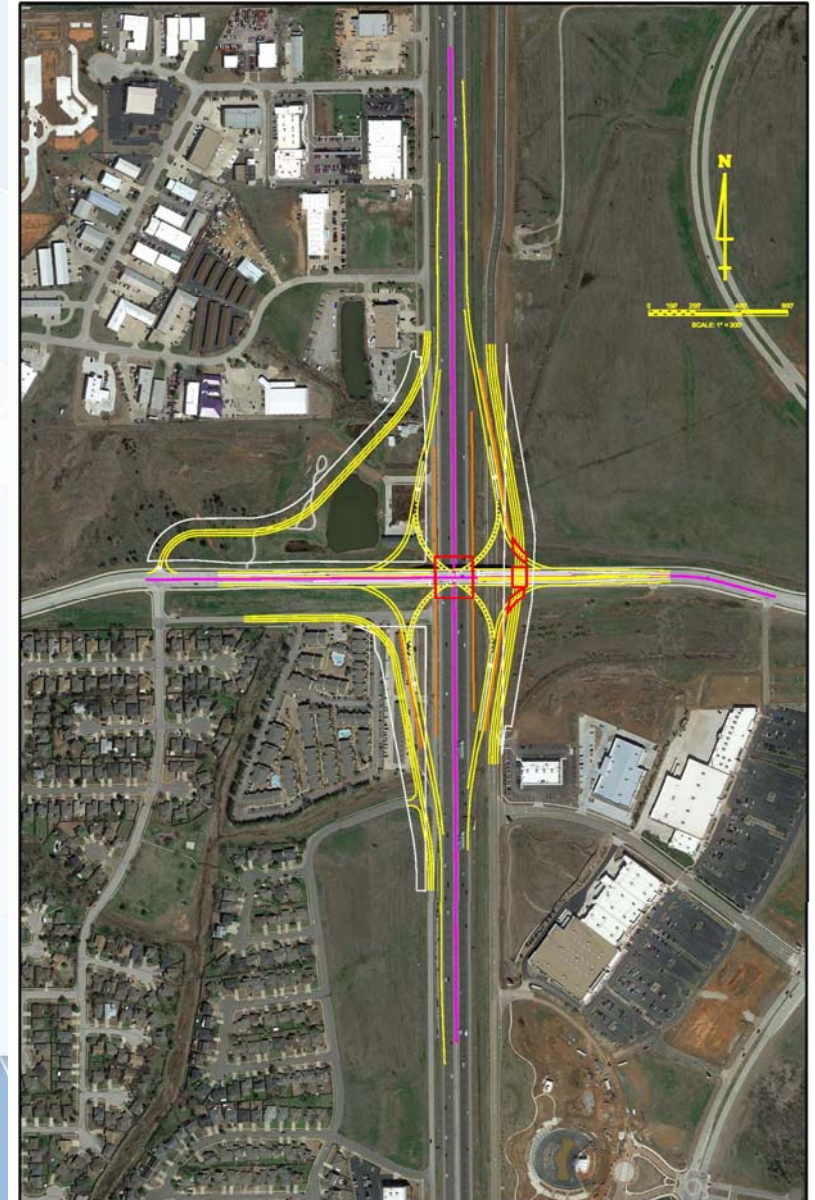
# Interchange Options

- Interchanges Considered
  - SPUI
  - Partial Cloverleaf (Parclo)
  - Freeway/Frontage Concept



# SPUI Features

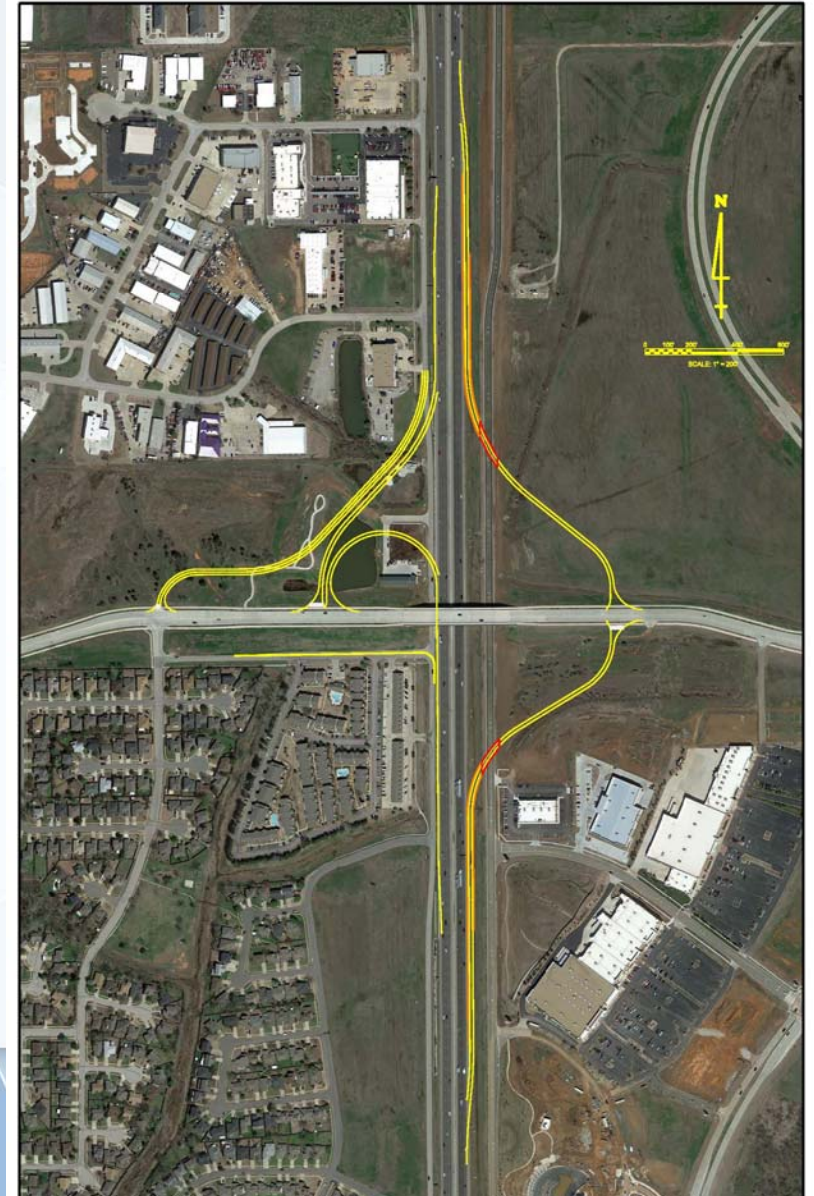
- SPUI at Rock Creek
  - Minimizes ROW
  - New Bridge Likely on Rock Creek
    - Major Traffic Disruption
  - Interstate Drive under Interchange
  - N Interstate Drive connect to Rock Creek
  - Additional Arterial Improvements Needed
    - Reduced Level from Prior Alts for CLU and MLU
  - Estimated Construction Cost: \$27 M





# Parclo Features

- Parclo Interchange at Rock Creek
  - Ramp Bridges over Interstate Drive
  - Maintain Existing Rock Creek Bridge
  - Avoids Impact to SW Quadrant
  - N Interstate Drive diverted to Rock Creek
  - Interstate Drive under Interchange
  - Less Developable Land in UNP
  - Additional Arterial Improvements Needed
    - Reduced Level from Prior Alts for CLU and MLU
  - Estimated Construction Cost: \$17.6 M

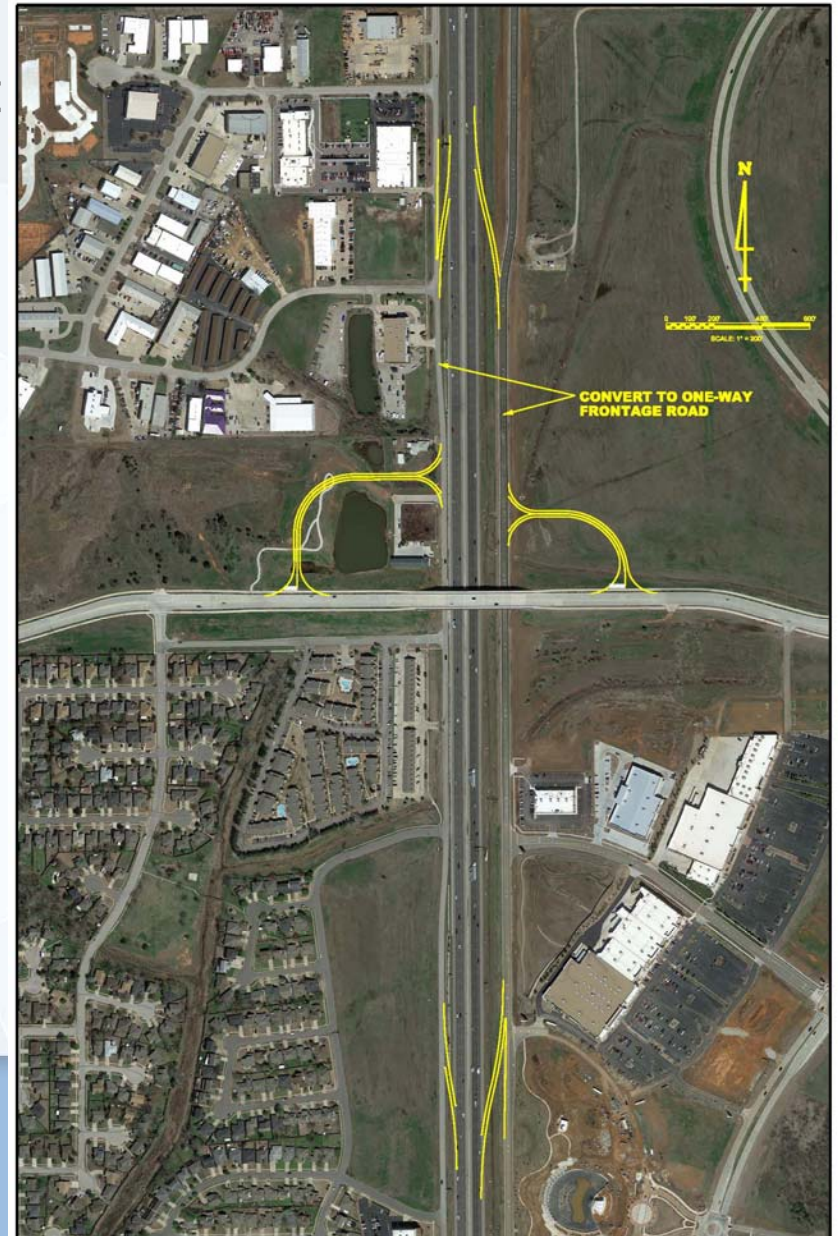






# Frontage Rd Interchange Features

- Slip Ramps / Frontage Road Concept
  - Minimizes ROW
  - Requires Connector Roads to Rock Creek Road
  - No new bridges
  - One-Way Conversion for Portion of Interstate Drive and N Interstate Drive
  - Additional Arterial Improvements Needed
    - Reduced Level from Prior Alts for CLU and MLU
  - Estimated Construction Cost: \$9.1 M

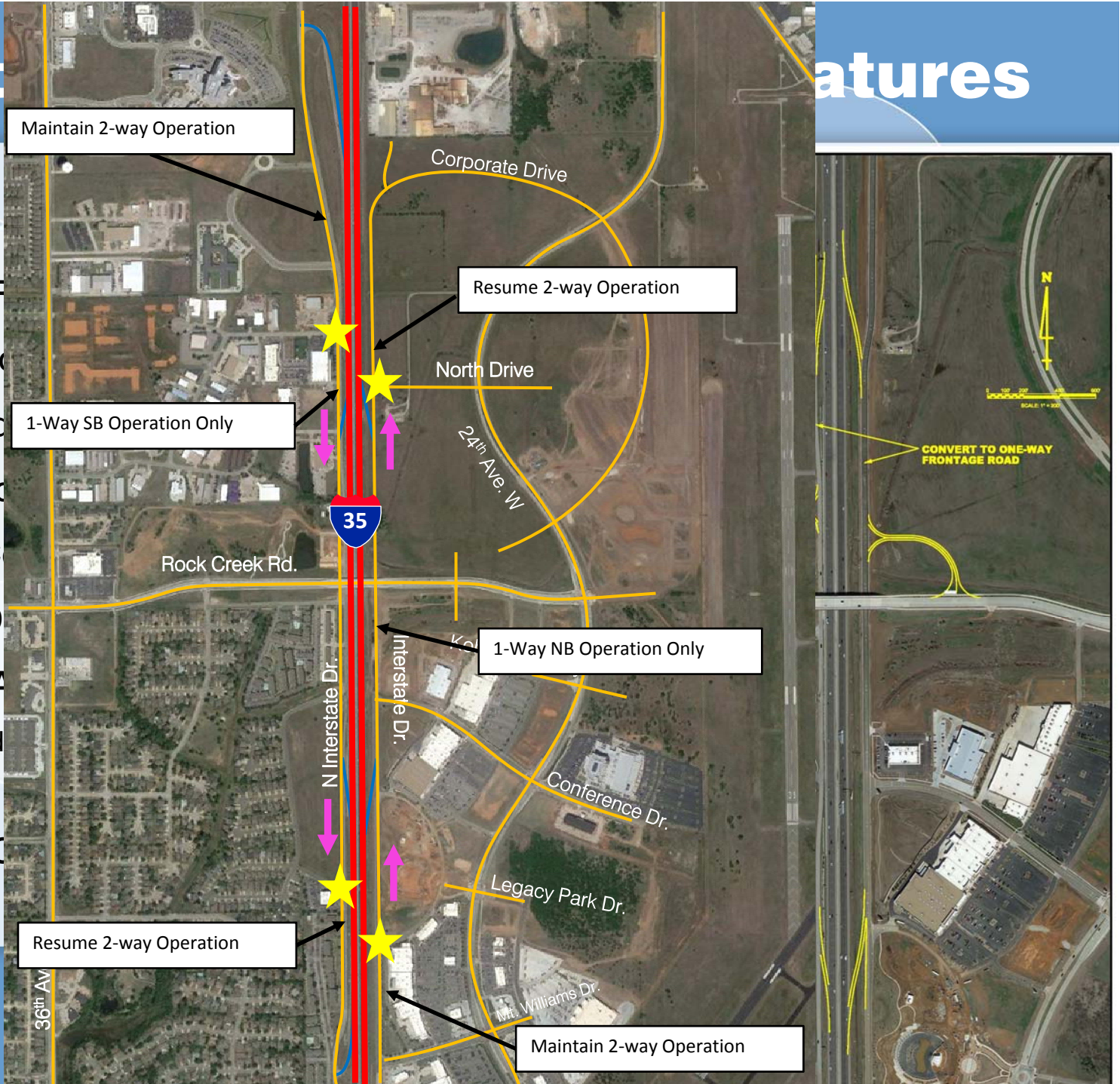




# Frontage

# Features

- Slip Ramps /
- Minimizes F
- Requires Co
- Creek Road
- No new brid
- One-Way C
- Interstate D
- Additional A
  - Reduced
  - MLU
- Estimated C



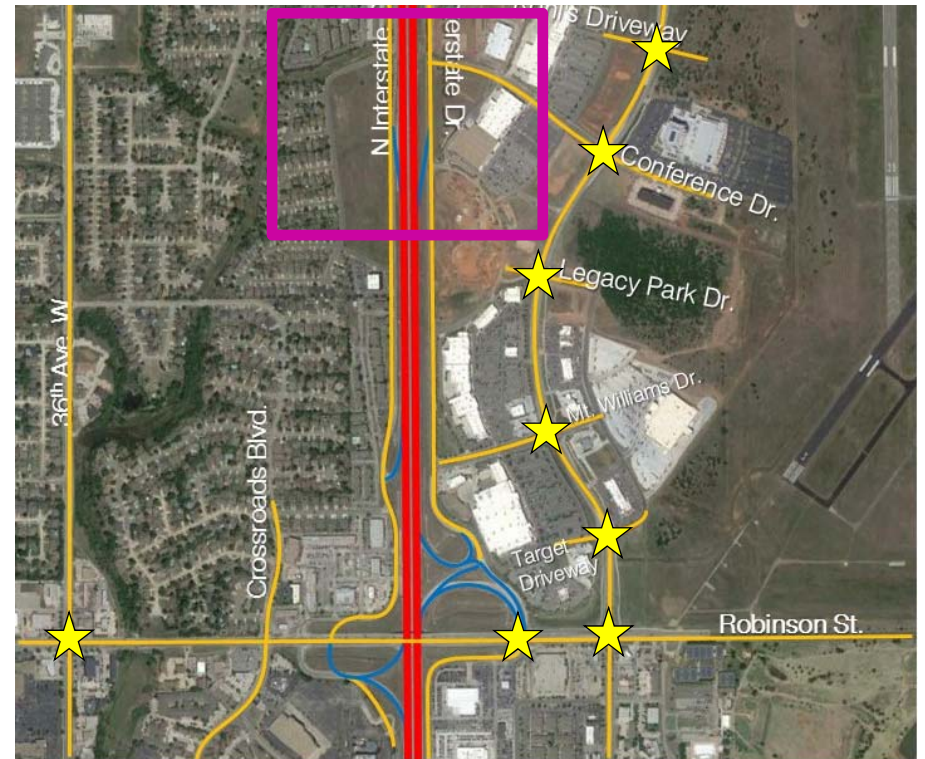
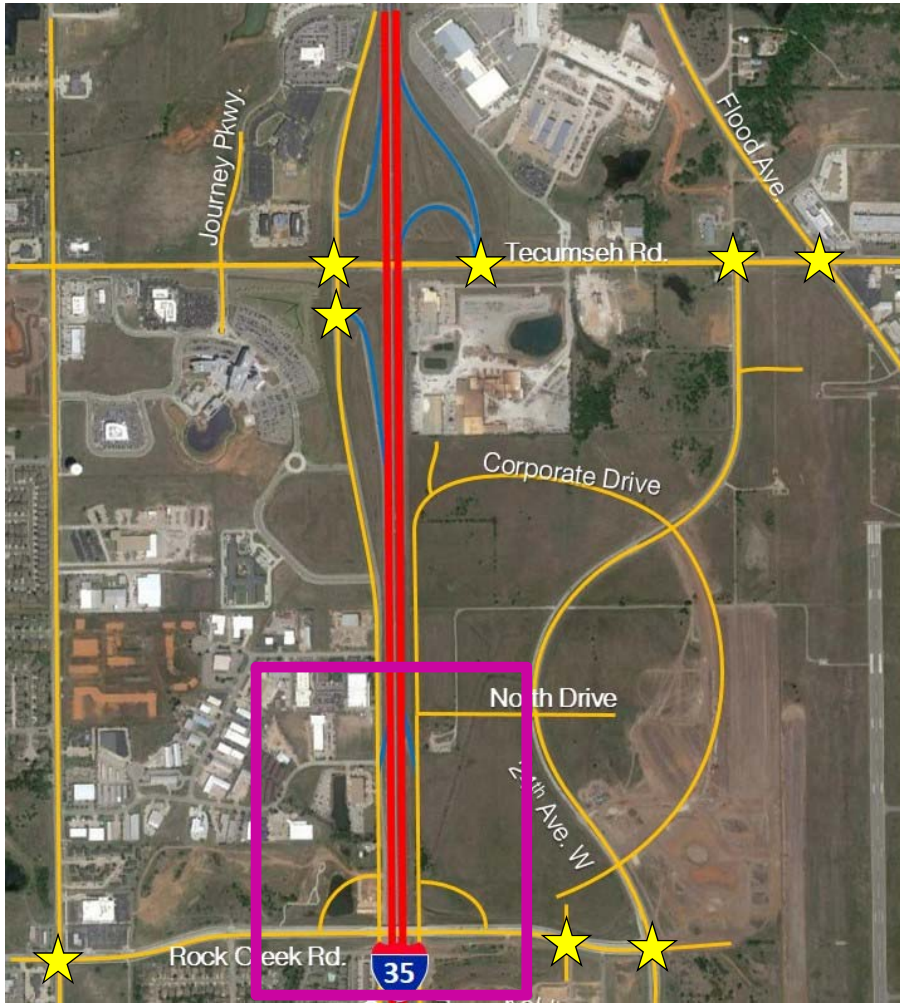


# General Interchange Operations

- Significant shift in traffic volume (30% of Robinson/Tecumseh interchange volume would use Rock Creek Road ramps)
- Improved operations on periphery and at interchanges
- Increased volumes at 24<sup>th</sup>/ Rock Creek – more internal congestion
- Interchange layouts at Rock Creek yield similar overall network delay when combined with Arterial improvements
  - SPUI/Parclo – no real difference in volume or network performance
  - Freeway/Frontage – further volume shifts
    - UNP trips bound for I-35 NB can use Interstate Drive
    - One-way Frontage Roads put some traffic on 24<sup>th</sup> Avenue or 36<sup>th</sup> Avenue
    - Overall network delay similar to SPUI/Parclo
- Due to cost and performance, Frontage Road Interchange concept moved forward



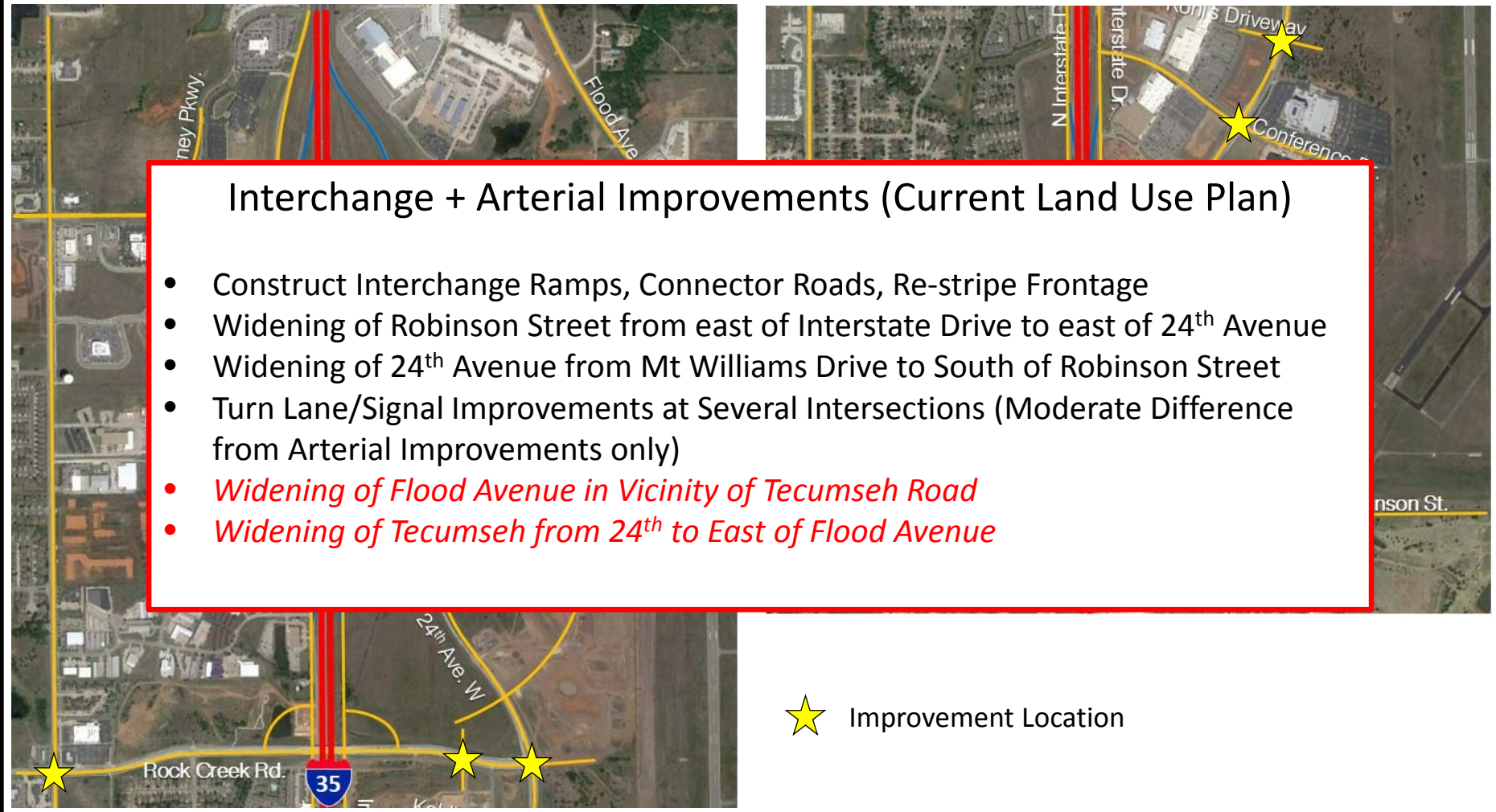
# Current LU – Arterial Imp + Int



★ Improvement Location



# Current LU – Arterial Imp + Int



## Interchange + Arterial Improvements (Current Land Use Plan)

- Construct Interchange Ramps, Connector Roads, Re-stripe Frontage
- Widening of Robinson Street from east of Interstate Drive to east of 24<sup>th</sup> Avenue
- Widening of 24<sup>th</sup> Avenue from Mt Williams Drive to South of Robinson Street
- Turn Lane/Signal Improvements at Several Intersections (Moderate Difference from Arterial Improvements only)
- *Widening of Flood Avenue in Vicinity of Tecumseh Road*
- *Widening of Tecumseh from 24<sup>th</sup> to East of Flood Avenue*

★ Improvement Location

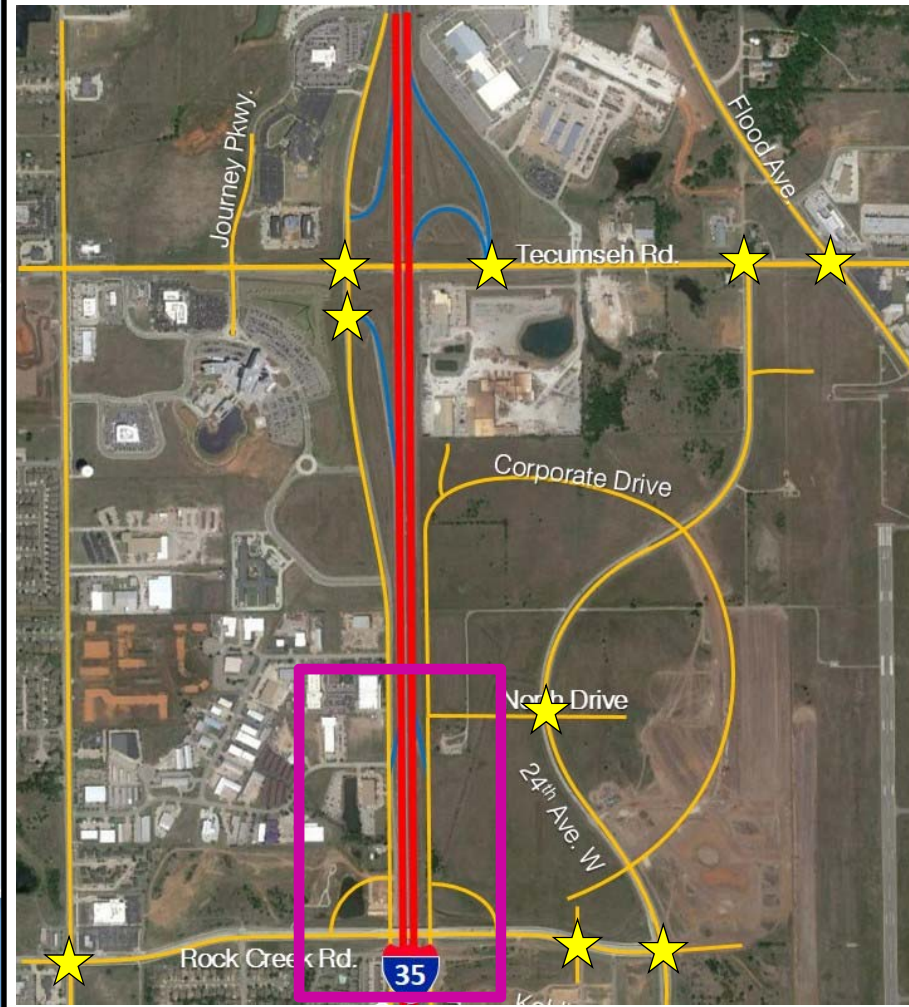


# Current LU – Arterial Imp + Int

- Capacity Analysis Results
  - Current Land Use Plan
    - Improvements bring delay to moderate level
    - No bridge widening required
    - Delay levels are within 1.0 to 1.5 the 2014 totals
  - Modified Land Use Plan
    - PM peak period needs additional arterial improvements to bring delay to more moderate level



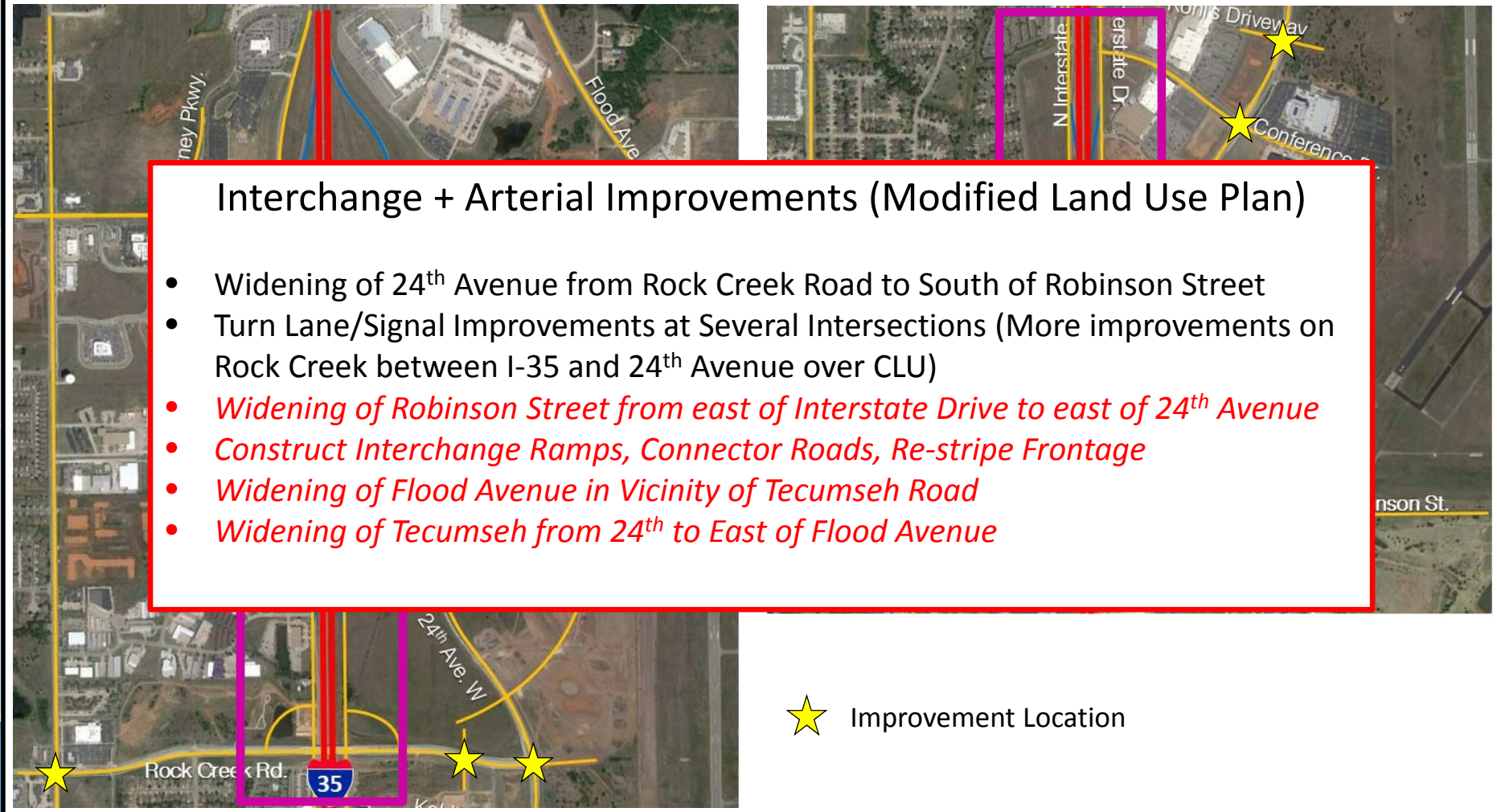
# Modified LU - Arterial Imp + Int



★ Improvement Location



# Modified LU – Arterial Imp + Int







# Modified LU – Arterial Imp + Int

- Capacity Analysis Results
  - Modified Land Use Plan
    - AM – Overall delay levels at 1.0 to 1.5 the 2014 values
    - PM – Overall delay levels at approximately 1.75 the 2014 value



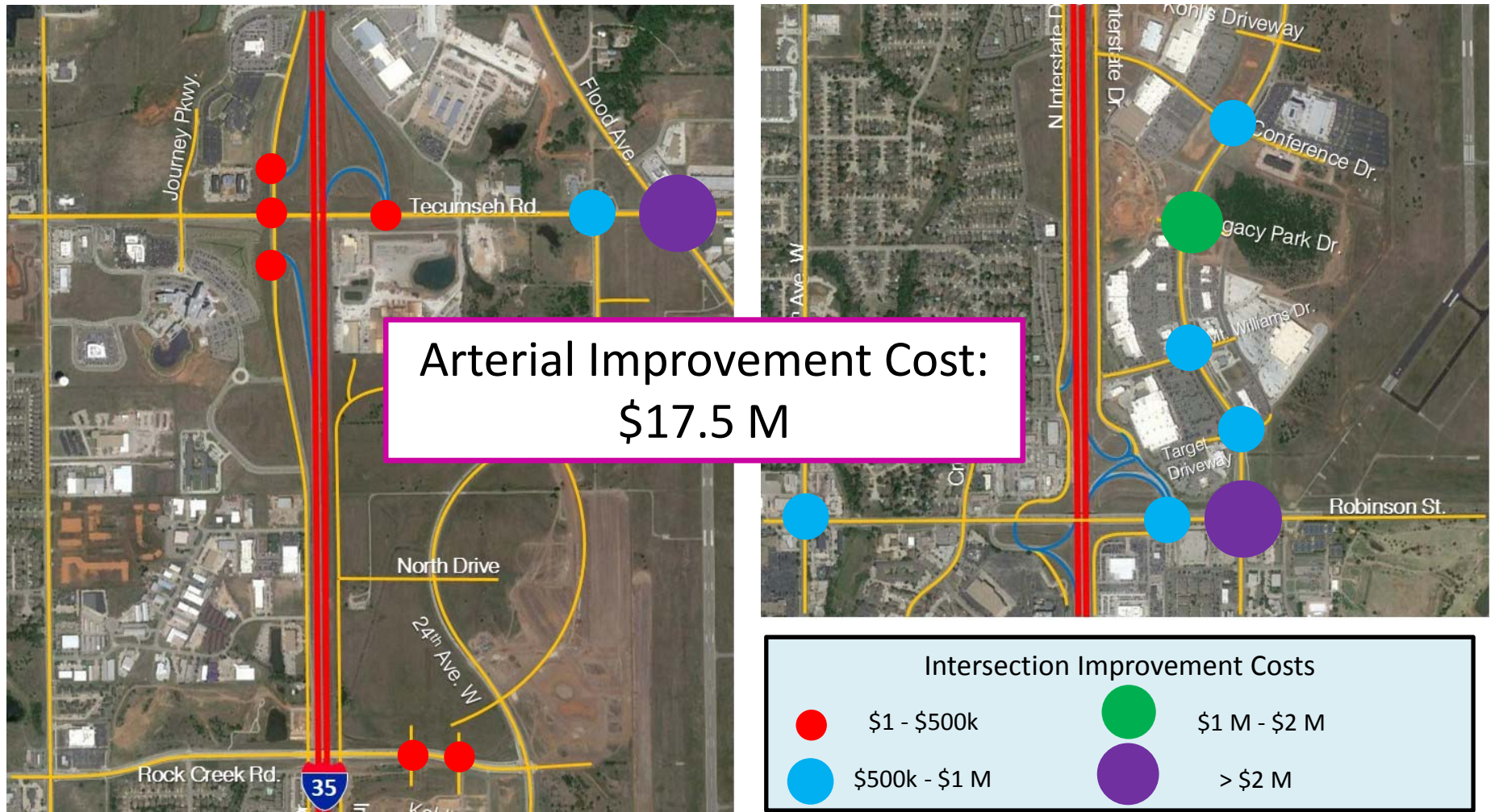
# Alternative Comparison

Year	Network	Analysis Period	
		AM	PM
2014	2014 UNP Development - Current Configuration	58	76
2035	Current Land Use - Existing + Committed Only	203	389
	Modified Land Use - Existing + Committed Only	226	565
	Current Land Use - Arterial Improvements Only	79	117
	Modified Land Use - Arterial Improvements Only	80	156
	Current Land Use - Freeway/Frontage Interchange + Arterial Improvements	69	113
	Modified Land Use - Freeway/Frontage Interchange + Arterial Improvements	74	134



# Project Costs

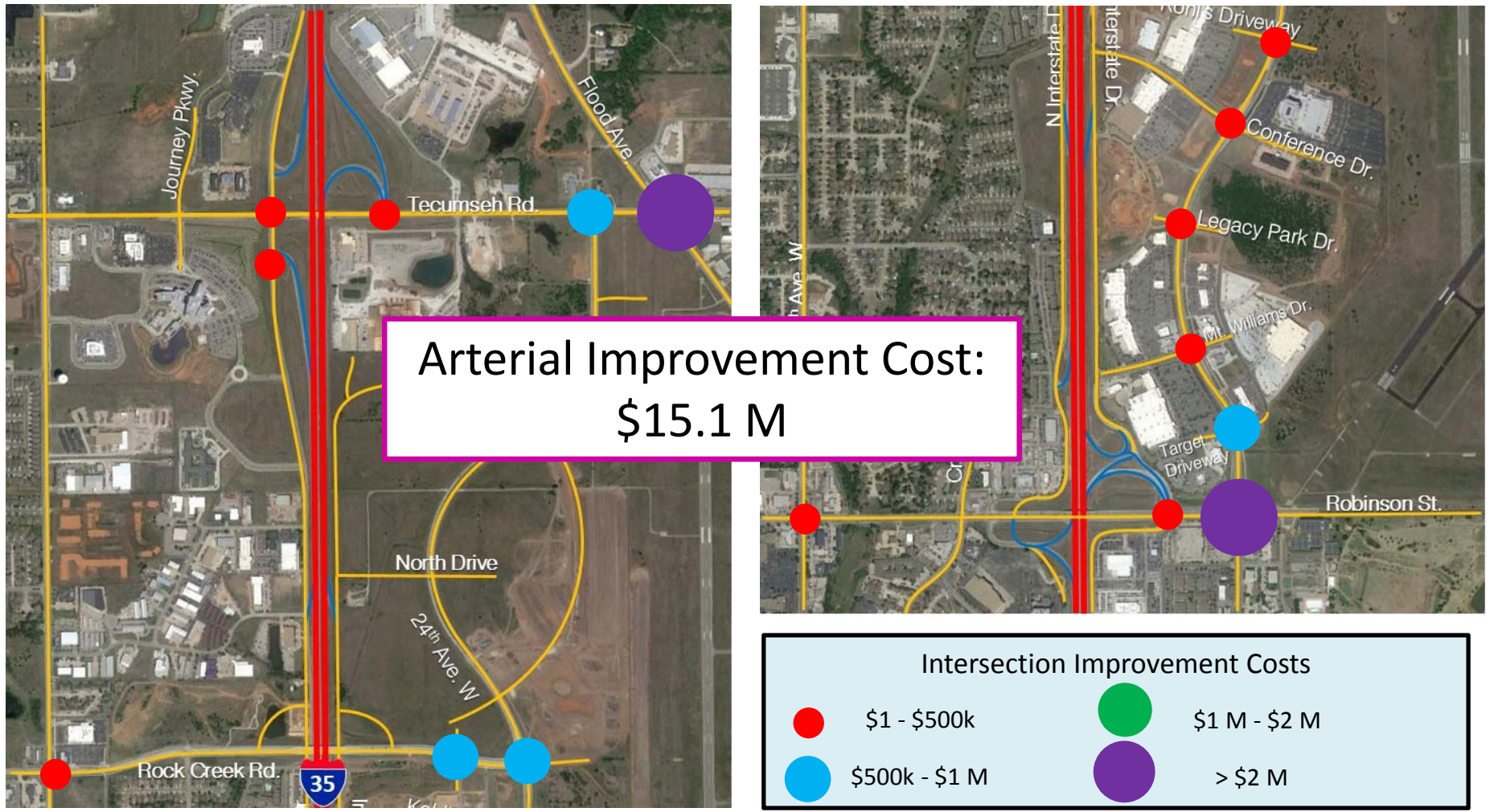
## Current Land Use Plan Volumes (No Interchange)





# Project Costs

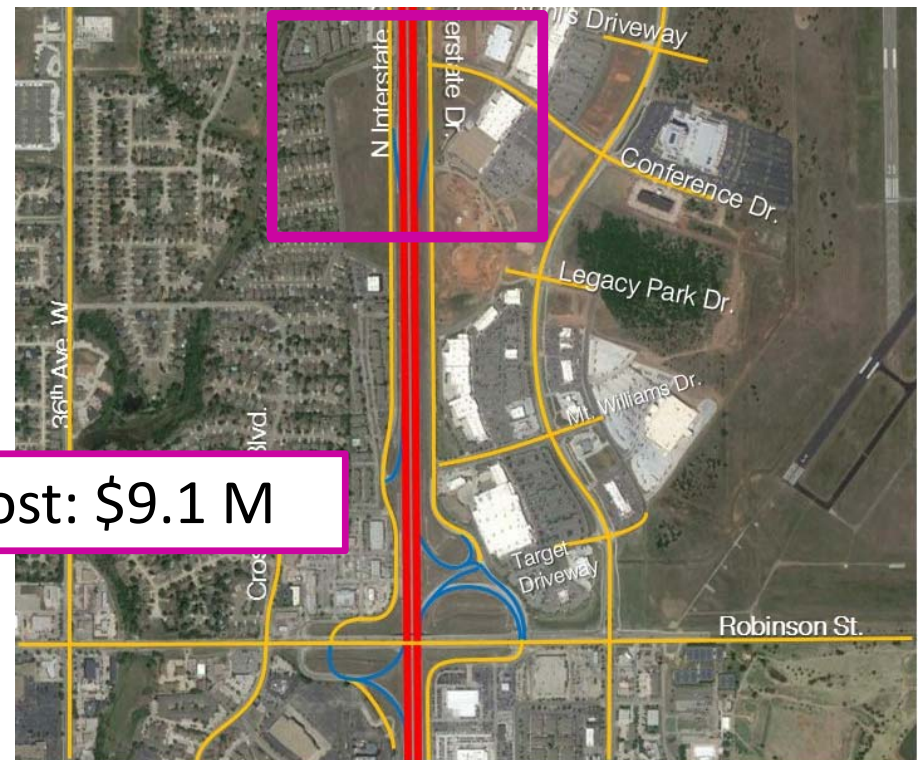
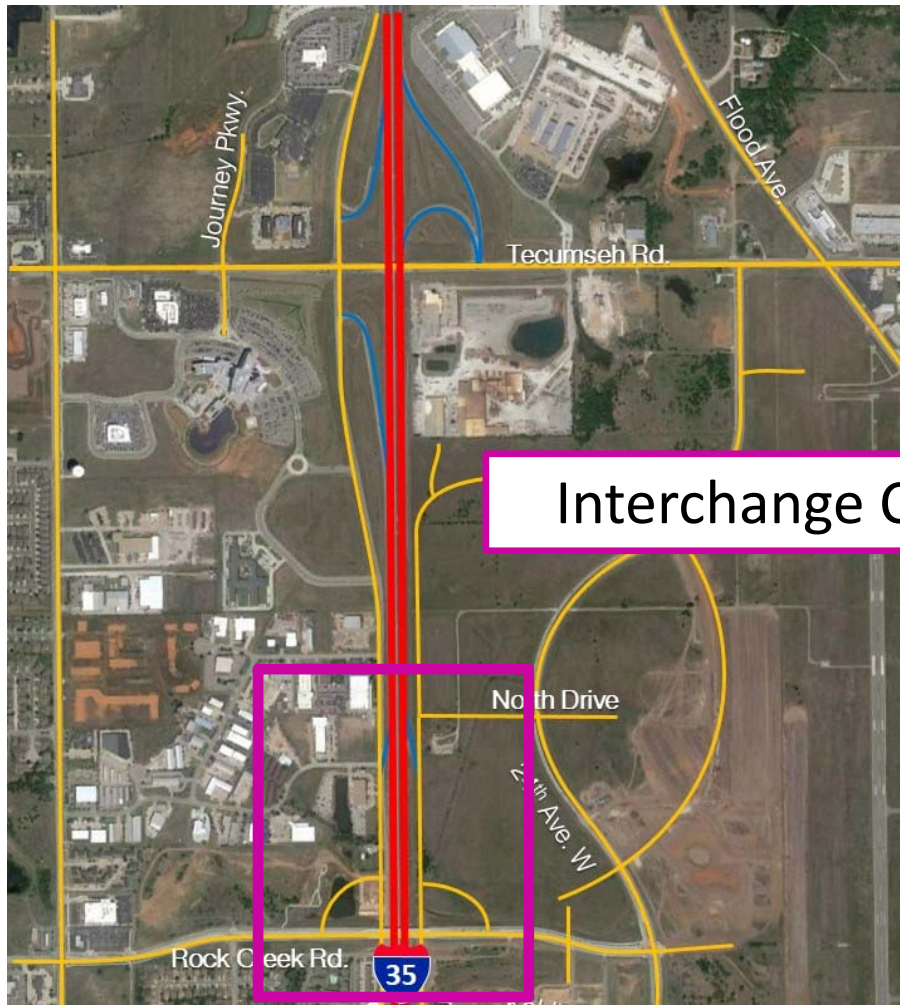
## Current Land Use Plan Volumes (with RC Interchange)





# Project Costs

## Current Land Use Plan Volumes (with RC Interchange)



Interchange Cost: \$9.1 M



# Project Costs

Modified Land Use Plan Volumes (No Interchange)

Arterial Improvement Cost:  
\$24.7 M



## Intersection Improvement Costs



\$1 - \$500k



\$1 M - \$2 M



\$500k - \$1 M

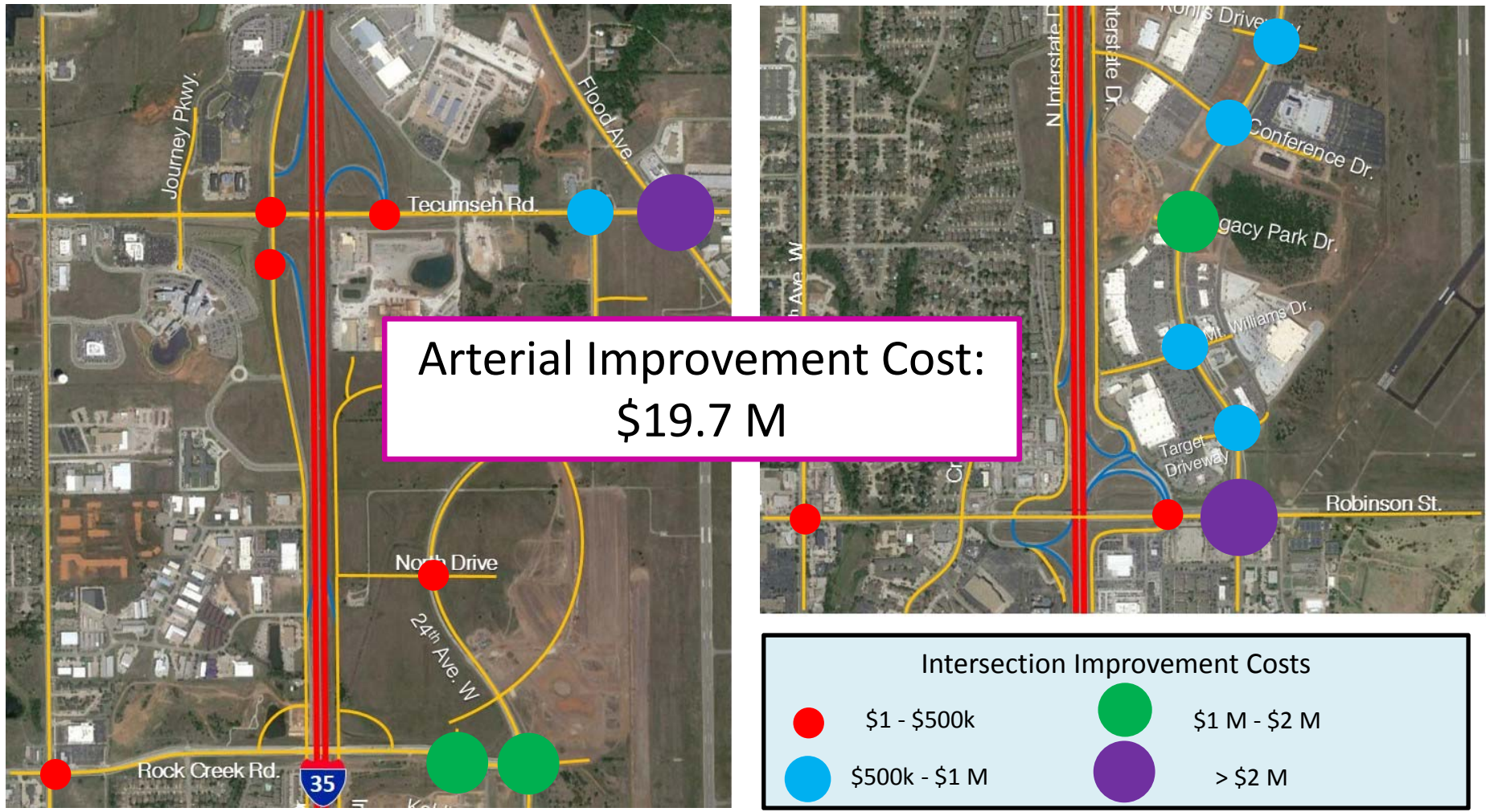


> \$2 M



# Project Costs

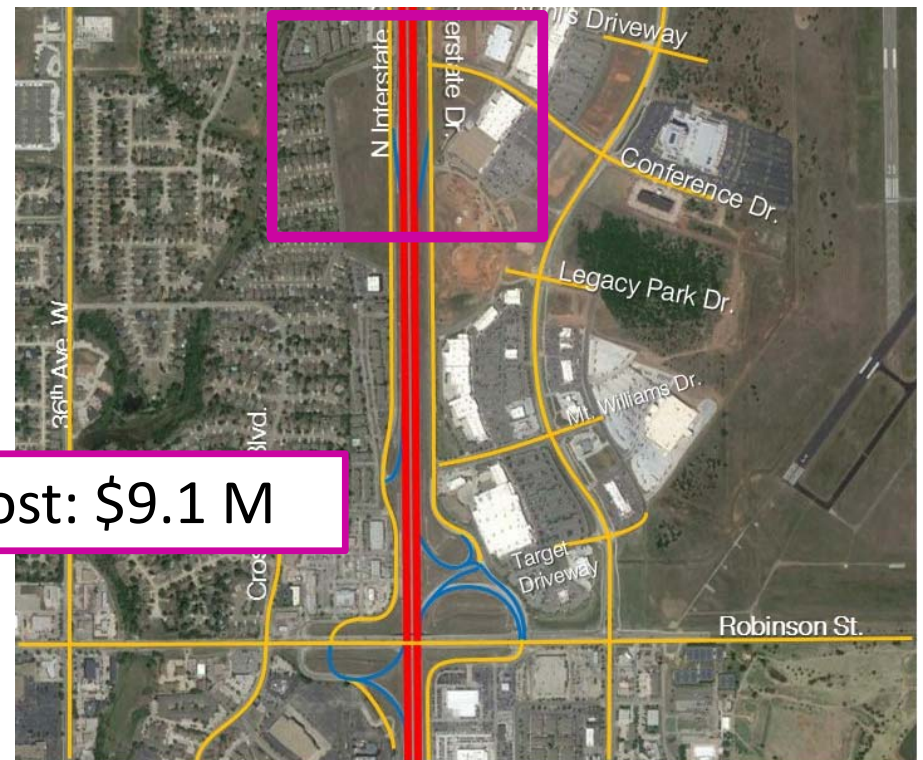
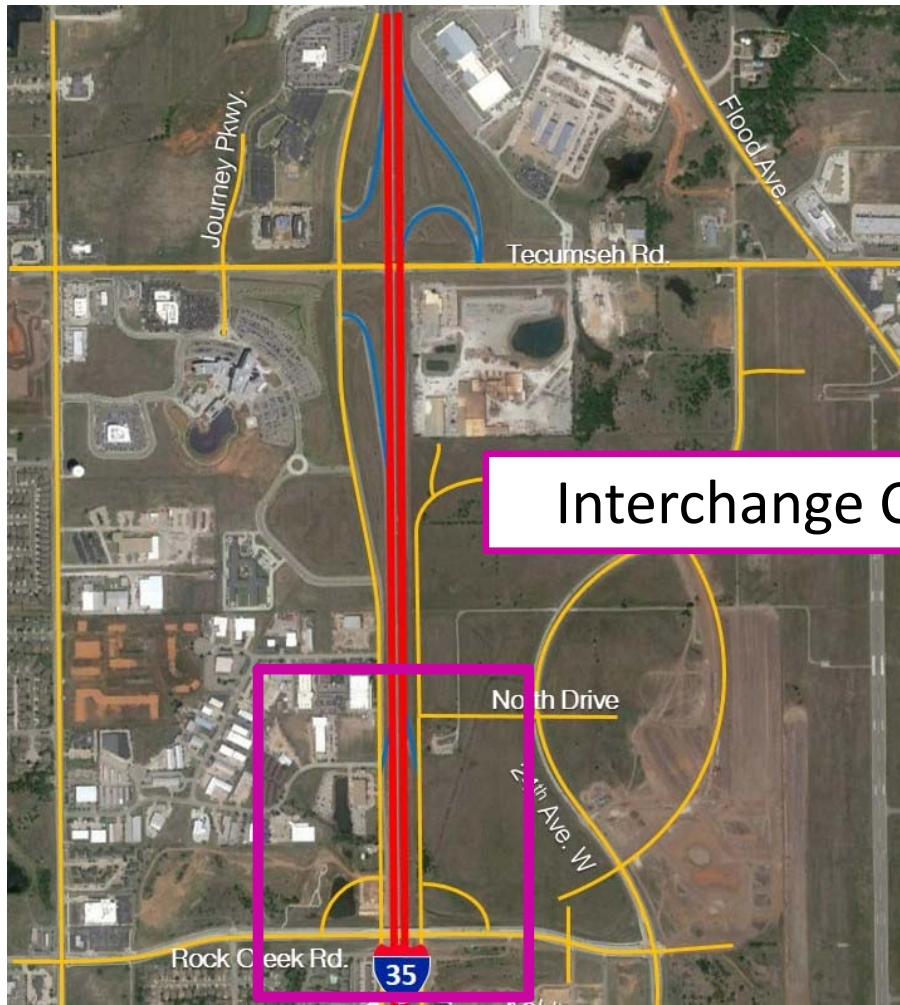
## Modified Land Use Plan Volumes (with RC Interchange)





# Project Costs

## Modified Land Use Plan Volumes (with RC Interchange)



Interchange Cost: \$9.1 M





# Project Cost Comparison

Land Use Plan	Lane Configurations	2015 COST		
		Freeway/Frontage Interchange	Additional Arterial Improvements	TOTAL
Current Land Use	Interchange + Arterial Improvements	\$9,110,000	\$15,130,000	<b>\$24,240,000</b>
Current Land Use	Arterial Improvements Only	\$0	\$17,470,000	<b>\$17,470,000</b>
Modified Land Use	Interchange + Arterial Improvements	\$9,110,000	\$19,690,000	<b>\$28,800,000</b>
Modified Land Use	Arterial Improvements Only	\$0	\$24,730,000	<b>\$24,730,000</b>

Note: Cost estimates for construction only – potential ROW costs not included.



# Conclusions

- Under Current Land Use,
  - Arterial Improvements options will reduce network delay per vehicle to reasonable 2035 levels (factor of 1.0 to 1.5 current levels)
  - Interchange at Rock Creek will reduce network delay by an additional 10%
  - Interchange Option costs \$6.8M more than Arterial-only
  - **Recommendation: Arterial Improvement Only Option**

Land Use Plan	Improvement Project
Short Term (0-5 Years)	All E+C Improvements (including UNP driveways)
	Tecumseh at N Interstate Drive/I-35 improvements
	Rock Creek Road Improvements (Interchange to 24th Avenue)
Mid Term (5-15 Years)	Robinson Street/Interstate Drive/24th Avenue Major Intersection Improvements
	36th Avenue at Robinson Street Intersection Improvements
	24th Avenue Improvements (Conference Drive to 24th Avenue)
Long Term (15+ Years)	Flood Avenue/Tecumseh Road/24th Avenue Road Major Intersection Improvements



# Conclusions

- Under Modified Land Use,
  - Arterial Improvements (including bridge widening at Robinson and Tecumseh) will lower network delay per vehicle to approximately twice existing levels.
  - Interchange options at Rock Creek will reduce network delay by 15% - 20% over Arterial Only option
    - Peripheral Study Area improves for non-UNP trips
  - Interchange Option costs \$4.0M more than Arterial-only
  - **Recommendation: Interchange + Arterial Option**

Land Use Plan	Improvement Project
Short Term (0-5 Years)	All E+C Improvements (including UNP driveways)
	Tecumseh at N Interstate Drive/I-35 improvements
	Rock Creek Road Improvements (Interchange to 24th Avenue)
Mid Term (5-15 Years)	Interchange with Frontage Road and New Connector Roads
	24th Avenue at Rock Creek Road intersection improvements
	36th Avenue at Rock Creek Road intersection improvements
Long Term (15+ Years)	24th Avenue Improvements (Rock Creek to 24th Avenue)
	Flood Avenue/Tecumseh Road/24th Avenue Road Major Intersection Improvements
	Robinson Street/24th Avenue Major Intersection Improvements
	36th Avenue at Robinson Street intersection improvements



# Questions and Discussion



