PRELIMINARY ENGINEERING REPORT

THE INTERSECTION OF SH-4 AND FOX LANE (EW-122)

GRADY COUNTY
JP 34262(04)

Prepared For:

OKLAHOMA Transportation

Prepared By:

CEC

TEC
A CLEAR DIRECTION

Environmental

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1.0 PROJECT INFORMATION

1.1 Project Description

The Oklahoma Department of Transportation is evaluating options to improve the traffic operational safety at the intersection of SH-4 and Fox Lane (EW-122) in Grady County, located three miles south of the SH-4 and SH-37 intersection. The intersection has been experiencing an increase in traffic volumes and accidents in recent years. This report and attached conceptual plans include options to improve the at-grade intersection, construction of a roundabout, and construction of a grade separated interchange. These options and their potential impacts are discussed and compared in this report.

An Intersection Safety Review was submitted to ODOT by Traffic Engineering Consultants (TEC) for this intersection in April 2019. The report is attached as an appendix to this report and is referred to within the information included in this report.

1.2 Existing Conditions

The project study area includes a two-lane section of SH-4 with open shoulders two feet wide that was constructed approximately twenty years ago as part of ODOT's CIP program. Since then, the intersection has been modified to include dedicated right turn lanes and left turn lanes from southbound and northbound SH-4 to Fox Lane. All of these lanes are approximately 180' long, not including tapers. Intersection signage and pavement rumble strips have been added on the approaches to the intersection. These are described in more detail in the field review notes included in Figure 2 of the safety review report.

The current traffic volume at this location for SH-4 is an Average Annual Daily Traffic (AADT) of 8,740 vehicles per day with 33% trucks (T) and 5% heavy trucks (T_3). A growth rate of approximately 2% has been identified for use to project the design traffic to the year 2050, resulting in a design year AADT of 15,900 vehicles per day. Twenty-two collisions have been recorded at this intersection during the ten-year period from August of 2010 to August of 2020. Twenty-three injuries, 9 possible injuries, and no fatalities were recorded. Most of these accidents, 59%, are recorded as right angle (front-to-side) collisions and 64% are due to failure-to- yield. The next highest type of collision recorded is angle turning at 13.6%. Most of the collisions involved passenger vehicles, 45.2%, and 4.8% involved heavy trucks. The predominant direction of vehicles are in the south and east traffic movements.

Traffic control at the intersection is currently a two-way stop-controlled intersection with the northbound/southbound movements operating freely. Based on 2021 design traffic volumes, delay on the two stop-controlled approaches at the intersection is moderate with the highest level of delay occurring on the eastbound approach during the a.m. peak hour at 91.3 seconds per vehicle. The 95th percentile eastbound queue is the longest during this period at 140 feet.

Existing utilities in the project area are overhead electric and underground communication. Solar powered roadway lighting has recently been installed at the northeast and southwest corners of the intersection.

1.3 Purpose and Need

The purpose and need for this project is to improve safety and traffic operations at this intersection. This preliminary engineering report has been produced do develop and compare feasible alternatives and to select the preferred alternative to accomplish this.

2.0 Alternatives

Alternatives to improve the existing at grade intersection, construction of a roundabout, and construction of a grade separated interchange are included in this report. Each alternative is evaluated for impacts to adjacent property, utilities, and the environment, as well as traffic operations, constructability and construction cost. A summary of the results are shown in the Roadway Alternatives Matrix included in this report.

2.1 At-Grade Intersection Alternatives

Alternative 1A - No build, maintain existing two-way stop

The existing intersection provides sufficient intersection sight distance for passenger cars and trucks to make left turns, right turns, and crossing movements from Fox Lane. There is also sufficient sight distance for northbound and southbound cars and trucks to turn left across opposing traffic to go east or west on Fox Lane.

The lengths of the existing right turn lanes do not meet the minimum recommended distances shown on Table 9.3C of the ODOT Roadway Design Manual.

The operational analysis of future traffic on this alternate demonstrates how the intersection will operate if nothing is constructed. The traffic operations today are not intolerable but do result in a level of service “F” and some queuing on the eastbound approach.

When design traffic data for 2030 and 2050 were analyzed at the intersection, delays at the intersection became significantly worse. By 2030, the eastbound approach will have a delay over 300 seconds per vehicle delay during the a.m. peak hour and over a 370-foot queue.

Based on these capacity analyses, capacity improvements will need to be made to maintain acceptable levels of service in the future. The alternates following in this report increase capacity at the intersection in various ways and will be used to determine an ultimate design for the intersection.

Alternative 1B – Existing two-way stop with eastbound and westbound turn lanes

The operational analysis of future traffic on this alternate demonstrates how the intersection would operate if the intersection were still two-way stop-controlled in the eastbound and westbound directions but if left and right-turn lanes are added on these approaches.

The addition of turn -lanes on the eastbound and westbound approaches improves operations at the intersection, but the amount of traffic along SH 4 still results in significant delay on the side street approaches. Again, the critical approach at the intersection is the eastbound approach which is expected to experience over 300 seconds per vehicle of delay by 2050.

Based on these capacity analyses, the capacity improvement from the addition of the turn-lanes on the eastbound and westbound approaches improve operations at the intersection but do not provide enough capacity for acceptable operations in 2050. The construction of the turn-lanes could be used as an interim improvement until an ultimate design is constructed.

Fox Lane is anticipated to be a widen and overlay section for this alternative. Traffic will be maintained on the existing lanes while the widenings are constructed, and the overlay completed during non-peak hours under traffic. Some temporary widening will be needed.

Since this alternative does not meet the future capacity needs of the intersection, it is not included in the conceptual plans.

Alternative 1C – Existing two-way stop with eastbound and westbound right turn lanes and acceleration lanes

The operational analysis of future traffic on this alternate demonstrates how the intersection would operate if the intersection were still two-way stop-controlled in the eastbound and westbound directions but if left and right-turn lanes are added with northbound and southbound acceleration lanes along SH 4. This would result in free right-turns in both directions from Fox Lane.

The addition of turn -lanes with acceleration lanes on the eastbound and westbound approaches improves operations at the intersection, but the amount of traffic along SH 4 still results in significant delay on the side street approaches. The critical approach at the intersection is the eastbound approach which is expected to experience over 300 seconds per vehicle of delay by 2050.

Based on these capacity analyses, the capacity improvement from the addition of the turn-lanes with acceleration lanes on the eastbound and westbound approaches improve operations at the intersection but do not provide enough capacity for acceptable operations in 2050. The construction of the turn-lanes could be used as an interim improvement until an ultimate design is constructed.

This alternate would be constructed by widening SH-4 and Fox Lane to add the acceleration lanes and turn lanes while traffic is maintained on the existing lanes. An asphalt overlay could be placed while maintaining traffic with the use of temporary traffic control flagging and pilot cars.

Additional permanent right-of-way will be needed along Fox Lane to the west and east of SH-4.

Since this alternative does not meet the future capacity needs of the intersection, it is not included in the conceptual plans.

Alternative 1D - Four-way stop

The operational analysis of future traffic on this alternate demonstrates how the intersection would operate if the intersection were converted to an all-way stop-controlled intersection with existing geometrics.

The conversion of the intersection to a four-way stop-controlled intersection does not necessarily improve operations at the intersection, but spreads the delay incurred on the side street under current two-way stop control to all vehicles through the intersection. The northbound and southbound approaches now become the critical approaches because they are higher volume. This condition would

result in over 200-foot queues along SH 4 under 2030 traffic conditions and queues over 700 feet under 2050 traffic conditions.

Based on these capacity analyses, the traffic control modification to a four-way stop controlled intersection results in additional queuing and delay at the intersection. The modification may improve safety and slightly lower delay and queuing on the side street in the short term but is not recommended as a long-term solution based on analyzed traffic operations. Since this alternative does not meet the future capacity needs of the intersection, it is not included in the conceptual plans.

Alternative 1E – Signalization with geometry improvements

A 2019 safety review of the intersection was conducted and as part of that review, signal warrants were run. The intersection did not meet warrants at the time of the review, but signalization of the intersection may be a viable alternate based on future traffic conditions. The operational analysis of future traffic on this alternate demonstrates how the intersection would operate if the intersection were signalized with the addition of eastbound and westbound left-turn lanes.

The installation of a traffic signal with the addition of eastbound and westbound left-turn lanes significantly improves delay, queues, and levels of service at the intersection. The analysis demonstrated that the intersection is anticipated to operate with acceptable levels of service on all approaches during both peak hours in 2050.

Based on these capacity analyses, the traffic control modification to a signalized intersection results in acceptable operations through 2050. Safety considerations of a signalized intersection along a high-speed facility should be considered, but this alternate has been shown to be viable based on traffic operations.

This alternative includes reconstruction of the SH-4 pavement to be able to stand up to traffic braking for a red light. The Fox Lane pavement is anticipated to be a widen and overlay section to add left turn lanes. The construction sequencing would require shifting traffic on SH-4 with some temporary pavement widening to reconstruct the SH-4 paving half at a time. Fox lane would be widened while maintaining traffic on the existing lanes and the final overlay placed under traffic.

Additional permanent right-of-way will be needed along Fox Lane to the west and east of SH-4.

Alternative 1F - Offset Turn Lanes

This alternative increases the length of the deceleration right turn lanes and offsets them 12 feet from the through lanes for the northbound and southbound directions. The traffic operation of the intersection isn't changed from what is shown for the previous at-grade alternatives. This alternative provides a safety improvement by increasing the visibility of through traffic to traffic stopped on Fox Lane by shifting turning traffic away from the through traffic. A layout of this alternative is included in the attached conceptual plans.

The operational results are the same as those described for Alternative 1A.

The construction sequencing for this alternative would leave SH-4 and Fox Lane traffic in their existing lanes while construction of the longer and wider offset deceleration/right lanes occurs to the outside. The existing lanes would have an overlay placed under traffic.

Additional permanent right-of-way will be needed along Fox Lane to the west and east of SH-4.

2.2 Roundabout Alternatives

Alternative 2A - Roundabout Alternative

A single lane roundabout is included as one of the alternatives to modify the existing intersection. The roundabout as shown in the conceptual drawing has a total diameter of 162'-8", an apron width of 14', and a lane width of 16' and has been designed to allow a WB-67 truck to travel through with the trailer wheels tracking up on the apron. The design speed through the roundabout is 25mph.

The construction of a single-lane roundabout increases capacity and safety at the intersection and improves operations more than any alternate 1 scenarios except for the signalized intersection. Based on 2030 traffic conditions, the roundabout would operate with good levels of service, but the southbound approach is expected to operate at a level of service "F" by 2050. This would result in a queue approximately 506 feet in length and an overall intersection level of service "F."

Based on these capacity analyses, the capacity improvement of a single-lane roundabout would improve operations at the intersection but would not provide enough capacity for acceptable operations in 2050. The construction of a roundabout could be used as an interim improvement until an ultimate design is constructed.

Construction sequencing will require temporary paving for Fox Lane and SH-4 to move traffic to while the roundabout is built. Efficient construction would be provided by utilizing the space available in the present right-of-way to build an at-grade detour to the north of the existing Fox Lane alignment, creating a new intersection location. The roundabout can be built one half at a time while SH-4 traffic is maintained on a combination of the existing pavement and temporary pavement widening. The roundabout could also be offset from the existing intersection to improve constructability without building the detour. Other sequencing options are available but would result in building the roundabout in quadrants with several traffic shifts and very low speeds through the intersection.

Additional permanent right-of-way will be needed along Fox Lane to the west and east of SH-4.

Alternative 2B - Roundabout Alternative with Bypass Lanes

This roundabout is included as one of the alternatives to modify the existing intersection. The roundabout as shown in the conceptual drawing also has a total diameter of 162'-8", an apron width of 14', and a lane width of 16' and has been designed to allow a WB-67 truck to travel through with the trailer wheels tracking up on the apron. Right-turn bypass lanes have been added to the north side of the roundabout to improve the traffic operations based on the dominant turn movements.

The operational analysis of future traffic on this alternate demonstrates how the intersection would operate if the intersection were converted to a single-lane roundabout intersection with right-turn bypass lanes for the southbound and westbound approaches.

The construction of a single-lane roundabout and bypass lanes increases capacity and safety at the intersection and improves operations more than any alternate 1 scenarios including the signalized intersection. Based on 2050 traffic conditions, the roundabout would operate with good levels of service at least through the year 2050.

Based on these capacity analyses, the capacity improvement of a single-lane roundabout with bypass lanes would improve operations at the intersection through the year 2050 and is a viable option based on traffic operations. Consideration of the number or trucks through this intersection should be made during design if this alternate is pursued.

This alternative is shown offset from the existing SH-4 and Fox Lane Intersection to reduce the impacts to traffic during the roundabout construction. Additional sub-phases and temporary paving will be required to complete all legs of the roundabout.

Additional permanent right-of-way will be needed along Fox Lane to the west and east of SH-4.

2.3 Interchange Alternatives

Three interchange alternatives have been considered for this preliminary engineering report to provide a grade separation at the SH-4 and Fox Lane intersection. Each option is a diamond interchange configuration.

The operational analysis of future traffic on the following alternates demonstrates how the interchange intersections would operate if the intersection was grade separated. Though the following alternates vary by which roadway is over which, and if the improvement is made on alignment or off alignment, the operational characteristics of the interchange intersections were very similar amongst all of the alternates.

The grade separation of the intersection would result in good operations. The lowest level of service with one-way stop control at the ramp intersections with Fox Lane, under 2050 traffic conditions, is a "B" with minimal delay and queuing. When the intersections were analyzed as roundabouts, all movements and overall intersection levels of service were improved to "A." Should roundabouts be considered at the interchange intersections, careful consideration of truck traffic should be made in the design process.

Based on these capacity analyses, all scenarios under alternate 3 are viable alternates based on traffic operations.

Alternative 3A - Fox Lane over SH-4

This alternative maintains traffic on the existing SH-4 roadway and reconstructs Fox Lane to go over. The existing SH-4 paving is included as an overlay of the existing paving and full depth widening to increase the shoulder widths from 2 feet wide to 8 feet wide. The interchange ramps have been designed to work with the divided configuration for SH-4 with minor reconstruction if this should be built in the future. The bridge GP&E shows a four-span structure to allow SH-4 with a 6 feet wide shoulder on the south side of the bridge to provide defined pedestrian access at this location.

The proposed roadway for Fox Lane is shown as a three-lane section with 8 feet wide shoulders to provide left turn lanes at the interchange ramps. The proposed profile for Fox Lane to cross over SH-4 requires up to 25 feet of embankment to provide the required bridge clearance over SH-4. Due to the existing grade of Fox Lane, the Fox Lane intersection with Mustang Road to the west of SH-4 will be impacted with approximately 10 feet of embankment to be able to meet a 45 mph design speed on Fox Lane.

The profile of Fox Lane shown in the attached plans does provide the required sight distances for passenger car and truck left turns as show in Tables 9-7 through 9-11 of the current AASHTO Green Book.

Construction sequencing will require temporary pavement widening and detour alignment for the Fox Lane traffic to shift traffic off the existing alignment while the embankment and new paving is placed. Building the temporary paving and detour to the north of the existing alignment appears to be the best option due to a drainage channel to the south of Fox Lane. Additional phasing coordination of the detour and the interchange ramp construction will be needed to maintain traffic throughout the project.

Additional permanent right-of-way will be needed along Fox Lane to the west and east of SH-4.

Alternative 3A2 - Fox Lane over 4 Lane SH-4

This alternative consists of the same configuration as alternative 3A with the addition of the northbound lanes on SH-4 to achieve the four-lane divided scenario as an option to prepare this corridor for increases in traffic volumes. Northbound crossovers are included at each end of the project to connect traffic to the existing SH-4 paving.

Alternative 3B - SH-4 over Fox Lane on Existing Alignment

This alternative reconstructs the SH-4 grade to go over Fox Lane. The bridge GP&E shows a three-span structure to clear the new wider paving shown on Fox Lane. The interchange ramps have been designed to work with the divided configuration for SH-4 with minor reconstruction if this should be built in the future. The ramp intersections with Fox Lane are closer to SH-4 than they are for the previous alternative to minimize additional right-of-way acquisition and developed property impacts. This closer intersection spacing does not negatively impact the traffic operations of Fox Lane through the interchange.

The profile of Fox Lane is shown to reconstruct Fox Lane as close to the existing profile as possible and meet the criteria for a 45 mph design speed. The sight distance requirements for passenger cars and trucks are met.

Construction sequencing will require moving SH-4 traffic off the current alignment to place the embankment and new paving required to carry SH-4 over Fox Lane. The most economical way to accomplish this is to build the new interchange ramps early in the project phasing so SH-4 traffic can be diverted to the ramps while the SH-4 embankment, paving, and bridge construction are completed. This would create two temporary highway intersection locations on Fox Lane. Another option is to build an at-grade detour offset from the existing SH-4 option for the length of the project to have one intersection location, but this would be more expensive option with a significant amount of temporary paving to be removed at the completion of the project.

Alternative 3B2 – Four Lane SH-4 over Fox Lane

This alternative consists of the same configuration as alternative 3B with the addition of the northbound lanes on SH-4 to achieve the four-lane divided scenario as an option to prepare this corridor for increases in traffic volumes. Northbound crossovers are included at each end of the project to connect traffic to the existing SH-4 paving.

Alternative 3C - SH-4 over Fox Lane on Offset Alignment with Parallel Ramp Lanes

For this Alternative, the new SH-4 alignment is offset 44 feet east of the SH-4 centerline of survey line shown in the attached conceptual plans so it is located where the northbound lanes of SH-4 would be for the ultimate divided four-lane configuration. The bridge GP&E shows a three-span structure to clear the new wider paving shown on Fox Lane. The southbound interchange ramps have been designed to work with the divided configuration for SH-4 with minor reconstruction if this should be built in the future.

The construction sequencing for this alternative allows SH-4 traffic to remain on the existing roadway for most of the project duration while the SH-4 offset and ramps are constructed. Temporary pavement widening or detours will be needed at the north and south ends of the project where the SH-4 offset connects back to the existing alignment. Some temporary paving will be needed to maintain traffic on Fox Lane while the widened section of Fox Lane is constructed.

3.0 Preferred Alternative

Alternative 3A2 is recommended as the preferred alternative for the intersection of SH-4 and Fox Lane. This alternative will reduce high-speed collisions with the separation of SH-4 and Fox Lane traffic by carrying Fox Lane over SH-4. It also provides increased capacity on SH-4 by building the four-lane divided highway configuration which can ultimately be connected to the sections of SH-4 to the north and south of this location that have already been widened for increased capacity.

APPENDIX A
ALTERNATIVE MATRIX

Alternative Matrix											
Alignment Description	**Alternative 1A** Existing Conditions	**Alternative 1D** At-Grade All Way Stop	**Alternative 1E** At-Grade with Signals & Geometry Improvements	**Alternative 1F** At-Grade with Offset Right Turn Lanes on SH-4	**Alternative 2A** Roundabout	**Alternative 2B** Roundabout with Bypass Lanes	**Alternative 3A** Interchange - Fox Lane over SH-4	**Alternative 3A2** Interchange - Fox Lane over Four Lane SH-4	**Alternative 3B** Interchange - SH-4 over Fox Lane Existing Alignment	**Alternative 3B2** Interchange - SH-4 over Four Lane Fox Lane	**Alternative 3C** Interchange - SH-4 over Fox Lane Offset Alignment Parallel Ramps
Project Costs											
Roadway & Traffic			$1,730,788	$1,364,636	$1,548,627	$2,283,506	$5,811,637	$7,913,179	$7,431,988	$11,487,581	$7,720,198
Bridge			$0	$0	$0	$0	$2,774,310	$2,774,310	$1,617,660	$2,989,800	$1,494,900
Total Estimated Construction Cost			$1,730,788	$1,364,636	$1,548,627	$2,283,506	$8,585,947	$10,687,489	$9,049,648	$14,477,381	$9,215,098
Utility Relocation Cost			$66,750	$66,750	$66,750	$66,750	$101,250	$101,250	$66,750	$66,750	$66,750
Right-of Way Cost			$22,000	$22,000	$4,000	$14,000	$55,000	$55,000	$18,000	$18,000	$28,200
Total Project Cost			$1,819,538	$1,453,386	$1,619,377	$2,364,256	$8,742,197	$10,843,739	$9,134,398	$14,562,131	$9,310,048
Utility Impacts											
Overhead Electric (Each Pole)			8	8	8	8	12	12	8	8	8
Communication (LF)			1,250	1,250	1,250	1,250	1,950	1,950	1,250	1,250	1,250
Permanent Right-of-Way Impacts											
Number of Parcels			4	4	3	3	6	6	4	4	4
Total Proposed Right-of-Way (acres)			1.10	1.10	0.20	0.70	2.75	2.75	0.90	0.90	1.41
Relocations			0	0	0	0	0	0	0	0	0
Minimum Level of Service											
2030	F / *EB AM & PM*	F / *NB AM*	C / *WB AM & PM*	C / *WB AM & PM*	C / *SB PM*	C / *SB PM*	B / *SB AM & PM*	B / *SB AM & PM*	B / *SB AM & PM*	B / *SB AM & PM*	B / *SB AM & PM*
2050	F / *EB AM & PM*	F / *NB AM, SB PM*	D / *WB AM & PM*	D / *WB AM & PM*	F / *SB PM*	F / *SB PM*	B / *NB AM & PM*	B / *NB AM & PM*	B / *NB AM & PM*	B / *NB AM & PM*	B / *NB AM & PM*
Safety Impacts											
Average Expected Crash Reduction Factor	---	---	37.15%	37.15%	49.50%	49.50%	36.50%	36.50%	36.50%	36.50%	36.50%
Environmental Impacts											
Community Facilities (# of Facilities)	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact
Cultural Resources (# of Sites)	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact
Economic Impacts (# of Locations)	2 - Simiilar Impact	2 - Simiilar Impact	2 - Simiilar Impact	2 - Simiilar Impact	2 - Simiilar Impact	2 - Simiilar Impact	2 - Simiilar Impact	2 - Simiilar Impact	2 - Simiilar Impact	2 - Simiilar Impact	2 - Simiilar Impact
Farmland Impacts (# of Acres)	0 - Low Impact	0 - Low Impact	0 - Low Impact	0 - Low Impact	0 - Low Impact	0 - Low Impact	0 - Low Impact	0 - Low Impact	0 - Low Impact	0 - Low Impact	0 - Low Impact
Floodplain Impacts (Acres)	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact	0 - No Impact
Hazardous Waste Impacts (# of sites)	0 - No Impact	0 - No Impact	0 - Low Impact	0 - Low Impact	0 - Low Impact	0 - Low Impact	0 - Low Impact	1 - Medium Impact	0 - Low Impact	0 - Low Impact	0 – Low Impact
Traffic Noise (conclusion of Noise Screening Analysis)	Low Impact	Low Impact	Low Impact	Low Impact	Low Impact	Low Impact	Low Impact	Low Impact	Low Impact	Low Impact	Low Impact
Section 4(f) Properties	0 - No Impact	0 - No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 - No Impact	0 – No Impact
Socioeconomic Impact and Environmental Justice	0 - No Impact	0 - No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 - No Impact	0 – No Impact
Federally Listed Species “Threatened, Endangered, & Candidate	Similar/Low Impact	Similar/Low Impact	Similar/Low Impact	Similar/Low Impact	Similar/Low Impact	Similar/Low Impact	Similar/Low Impact	Similar/Low Impact	Similar/Low Impact	Similar/Low Impact	Similar/Low Impact
Stream Impacts “USGS-Mapped” (Linear Feet)	511 – Medium Impact	511 – Medium Impact	511 – Medium Impact	511 – Medium Impact	511 – Medium Impact	511 – Medium Impact	511 – Medium Impact	775 - Medium Impact	511 – Medium Impact	511 – Medium Impact	632 – Medium Impact
Stream Impacts “Non-mapped Features” (Potential Linear Feet)	1026 – Medium Impact	1026 – Medium Impact	1026 – Medium Impact	1026 – Medium Impact	968 – Medium Impact	968 – Medium Impact	1026 – Medium Impact	1026 - Medium Impact	1026 – Medium Impact	1026 – Medium Impact	1026 – Medium Impact
Tribal Property (# of Parcels)	0 - No Impact	0 - No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 - No Impact	0 – No Impact
Wetland Impacts “Potential” (# of Acres)	0 - No Impact	0 - No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 – No Impact	0 - No Impact	0 – No Impact

APPENDIX B
ALTERNATIVES OPERATIONAL ANALYSIS

MEMORANDUM

January 21, 2022

TO: Mr. Taylor Barnes, P.E.

FROM: Michael Hofener, P.E., PTOE

SUBJECT: Preliminary Engineering Study Memo – J/P 34262(04)

LOCATION: SH 4 at Fox Lane (EW 122) in Grady County

INTRODUCTION

Traffic Engineering Consultants, Inc. (TEC) was contracted by CEC Corporation to conduct traffic operational analysis on the intersection of SH 4 and Fox Lane. This memo is documentation of the work conducted by TEC for the Preliminary Engineering Study as part of phase 1 of this multi-phase project.

BACKGROUND

TEC was contracted to conduct the following work:

Design Traffic Data

- Develop 2021 Design Traffic Data on the Existing Configuration
- Develop Interim 2030 Design Traffic Data on the Existing Configuration
- Develop Future 2050 Design Traffic Data on Existing Configuration

Figures 1 through **6** are summaries of all design traffic data developed for this project and approved by ODOT and are included as an attachment to this memo.

Operational Analysis of Alternatives

- LOS Summary of 2021 Traffic on Existing Configuration
- LOS Summary of 2050 Traffic on Existing Configuration
- LOS Summary of 2050 Traffic on Existing Optimized Configuration
- LOS Summary of 2050 Traffic on Four-Way Stop-Controlled Configuration
- LOS Summary of 2050 Traffic on Signalized Configuration
- LOS Summary on 2050 Grade Separated Diamond

Operational Analysis of Constructability

- LOS Summary of 2030 Traffic for Fox Lane over SH 4
- LOS Summary of 2030 Traffic for SH 4 over Fox Lane on Existing Alignment
- LOS Summary of 2030 Traffic for SH 4 over Fox Lane on Offset Alignment

The following Alternates were developed by the team and analyzed as a part of this analysis:

- Alternate 1A – Existing Configuration and Control
- Alternate 1B – Existing Configuration Optimized – E/W Turn Lanes
- Alternate 1C – Existing Configuration Optimized – E/W Turn Lanes with Accel. Lanes
- Alternate 1D – Existing Configuration – Four-Way Stop-Controlled
- Alternate 1E – Existing Configuration – Signalized with Improved Geometrics
- Alternate 1F – Existing Configuration with Offset Turn-Lanes
- Alternate 2A – Roundabout Controlled
- Alternate 2B – Roundabout with Bypass Lanes
- Alternate 3A – Diamond Interchange – Fox Lane Over on Existing Alignment
- Alternate 3B – Diamond Interchange -SH 4 Over on Existing Alignment
- Alternate 3C/D – Diamond Interchange – SH 4 Over on Offset Alignment
- Alternate 3E – Diamond Interchange – SH 4 Over with Roundabouts

The attached **Table 1** is a summary of the capacity analyses conducted for each of the above listed alternates. The Synchro print-out sheets and a summary of the geometrics analyzed at each intersection are included as an attachment.

DISCUSSION

Alternate 1A

Traffic control at the intersection is currently two-way stop-control with the northbound/southbound movements operating freely. Based on 2021 design traffic volumes, delay on the two stop-controlled approaches at the intersection is moderate with the highest level of delay occurring on the eastbound approach during the a.m. peak hour at 91.3 seconds per vehicle. This corresponds to a level of service "F." The 95th percentile eastbound queue is the longest during this period at 140 feet.

The operational analysis of future traffic on this alternate demonstrates how the intersection will operate if nothing is constructed. The traffic operations today are not intolerable but do result in a level of service "F" and some queuing on the eastbound approach.

When design traffic data for 2030 and 2050 were analyzed at the intersection, delays at the intersection became significantly worse. By 2030, the eastbound approach will have a delay over 300 seconds per vehicle delay during the a.m. peak hour and over a 370-foot queue.

Based on these capacity analyses, capacity improvements will need to be made to maintain acceptable levels of service in the future. The alternates following in this report increase

capacity at the intersection in various ways and will be used to determine an ultimate design for the intersection.

Alternate 1B

The operational analysis of future traffic on this alternate demonstrates how the intersection would operate if the intersection were still two-way stop-controlled in the eastbound and westbound directions but if left and right-turn lanes are added on these approaches.

The addition of turn -lanes on the eastbound and westbound approaches improves operations at the intersection, but the amount of traffic along SH 4 still results in significant delay on the side street approaches. Again, the critical approach at the intersection is the eastbound approach which is expected to experience over 300 seconds per vehicle of delay by 2050.

Based on these capacity analyses, the capacity improvement from the addition of the turn-lanes on the eastbound and westbound approaches improve operations at the intersection but do not provide enough capacity for acceptable operations in 2050. The construction of the turn-lanes could be used as an interim improvement until an ultimate design is constructed.

Alternate 1C

The operational analysis of future traffic on this alternate demonstrates how the intersection would operate if the intersection were still two-way stop-controlled in the eastbound and westbound directions but if left and right-turn lanes are added with northbound and southbound acceleration lanes along SH 4. This would result in free right-turns in both directions from Fox Lane.

The addition of turn -lanes with acceleration lanes on the eastbound and westbound approaches improves operations at the intersection, but the amount of traffic along SH 4 still results in significant delay on the side street approaches. The critical approach at the intersection is the eastbound approach which is expected to experience over 300 seconds per vehicle of delay by 2050.

Based on these capacity analyses, the capacity improvement from the addition of the turn-lanes with acceleration lanes on the eastbound and westbound approaches improve operations at the intersection but do not provide enough capacity for acceptable operations in 2050. The construction of the turn-lanes could be used as an interim improvement until an ultimate design is constructed.

Alternate 1D

The operational analysis of future traffic on this alternate demonstrates how the intersection would operate if the intersection were converted to an all-way stop-controlled intersection with existing geometrics.

The conversion of the intersection to a four-way stop-controlled intersection does not necessarily improve operations at the intersection, but spreads the delay incurred on the side street under current two-way stop control to all vehicles through the intersection. The northbound and southbound approaches now become the critical approaches because they are higher volume. This condition would result in over 200-foot queues along SH 4 under 2030 traffic conditions and queues over 700 feet under 2050 traffic conditions.

Based on these capacity analyses, the traffic control modification to a four-way stop controlled intersection results in additional queuing and delay at the intersection. The modification may improve safety and slightly lower delay and queuing on the side street in the short term but is not recommended as a long-term solution based on analyzed traffic operations.

Alternate 1E

A 2019 safety review of the intersection was conducted and as part of that review, signal warrants were run. The intersection did not meet warrants at the time of the review, but signalization of the intersection may be a viable alternate based on future traffic conditions. The operational analysis of future traffic on this alternate demonstrates how the intersection would operate if the intersection were signalized with the addition of eastbound and westbound left-turn lanes.

The installation of a traffic signal with the addition of eastbound and westbound left-turn lanes significantly improves delay, queues, and levels of service at the intersection. The analysis demonstrated that the intersection is anticipated to operate with acceptable levels of service on all approaches during both peak hours in 2050.

Based on these capacity analyses, the traffic control modification to a signalized intersection results in acceptable operations through 2050. Safety considerations of a signalized intersection along a high-speed facility should be considered, but this alternate has been shown to be viable based on traffic operations.

Alternate 1F

An independent analysis of this alternate was not conducted. Offset turn-lanes at the intersection have no effect on the capacity of the intersection therefore the results for Alternate 1A are the same as the results for Alternate 1F.

Alternate 2A

The operational analysis of future traffic on this alternate demonstrates how the intersection would operate if the intersection were converted to a single-lane roundabout intersection.

The construction of a single-lane roundabout increases capacity and safety at the intersection and improves operations more than any alternate 1 scenarios except for the signalized intersection. Based on 2030 traffic conditions, the roundabout would operate with good levels of service, but the southbound approach is expected to operate at a level of service "F" by 2050. This would result in a queue approximately 506 feet in length and an overall intersection level of service "F."

Based on these capacity analyses, the capacity improvement of a single-lane roundabout would improve operations at the intersection but would not provide enough capacity for acceptable operations in 2050. The construction of a roundabout could be used as an interim improvement until an ultimate design is constructed.

Alternate 2B

The operational analysis of future traffic on this alternate demonstrates how the intersection would operate if the intersection were converted to a single-lane roundabout intersection with right-turn bypass lanes on the eastbound and northbound approaches.

The construction of a single-lane roundabout and bypass lanes increases capacity and safety at the intersection and improves operations more than any alternate 1 scenarios including the signalized intersection. Based on 2050 traffic conditions, the roundabout would operate with good levels of service at least through the year 2050.

Based on these capacity analyses, the capacity improvement of a single-lane roundabout with bypass lanes would improve operations at the intersection through the year 2050 and is a viable option based on traffic operations. Consideration of the number or trucks through this intersection should be made during design if this alternate is pursued.

Alternates 3A -C

The operational analysis of future traffic on the following alternates demonstrates how the interchange intersections would operate if the intersection was grade separated. Though the following alternates vary by which roadway is over which, and if the improvement is made on alignment or off alignment, the operational characteristics of the interchange intersections were very similar amongst all of the alternates. Alternates 3A through 3D assumed the intersections were one-way stop controlled and Alternate 3E analyzed the intersections as roundabouts.

ATTACHMENT A

TRAFFIC DATA

The grade separation of the intersection would result in good operations. Under all conditions, the lowest level of service under 2050 traffic conditions is a "B" with minimal delay and queuing. When the intersections were analyzed as roundabouts, all movements and overall intersection levels of service were improved to "A."

Based on these capacity analyses, all scenarios under alternate 3 are viable alternates based on traffic operations. Should roundabouts be considered at the interchange intersections, careful consideration of truck traffic should be made in the design process.

Safety (CMF/CRF)

An analysis of possible Crash Reduction Factors (CRF) was conducted for the two-way stop control intersection compared to signalization of the intersection, installation of a roundabout at the intersection, and conversion of the intersection to a diamond interchange. The CRF Clearinghouse was consulted for this work. **Table 2** is a summary of the information found.

TABLE 2

Crash Reduction Factor Summary

Alternate / Intersection Type		Two-Way Stop Control CRF (%)		CMF Clearinghouse Information
		Low	High	
Alternate 1E	Signalization	10.8	63.5	Install a traffic signal and left-turn lanes. All crash types.
Alternate 2B	Roundabout	12	87	Convert intersection with minor-road stop control to modern roundabout. All crash types.
Alternate 3A	Diamond Interchange	16	57	Elvik, R. and Erke, A, "revision of the Hand Book of Road Safety Measures: Grade Separated Junctions." (03-27-2007). All Crash Types
Alternate 3B				
Alternate 3C				
Alternate 3D				
Alternate 3E				

The data available provided a wide range of reduction factors. To document this data a range of the data is given. The range was taken only from reports that look at "all crash types" in order to gain a better understanding of the potential benefits of each. To make a quick comparison, the average of the range will be utilized and is as follows:

- Alternate 1E - 37.15%
- Alternate 2B - 49.5%
- Alternates 3A – E - 36.5%

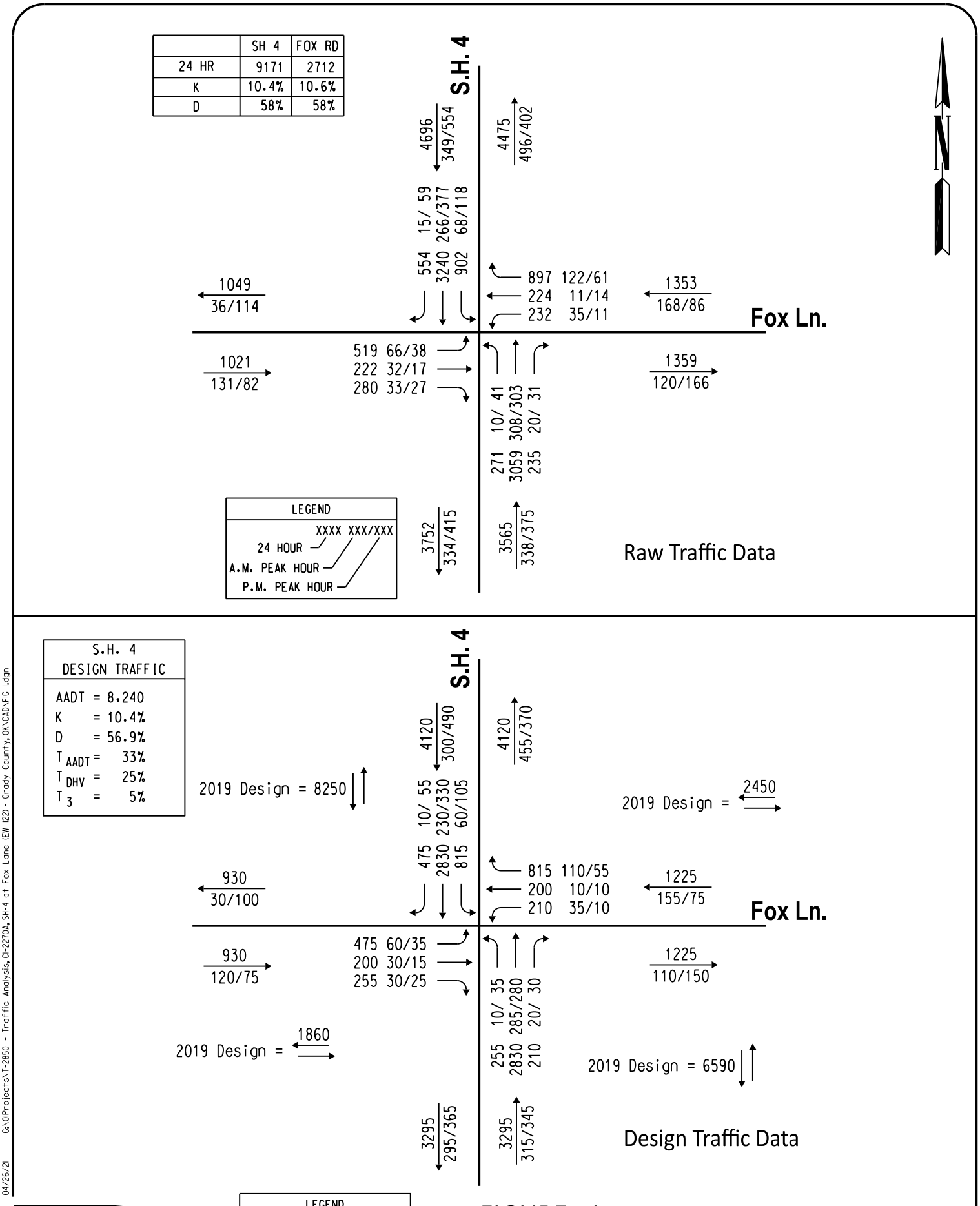
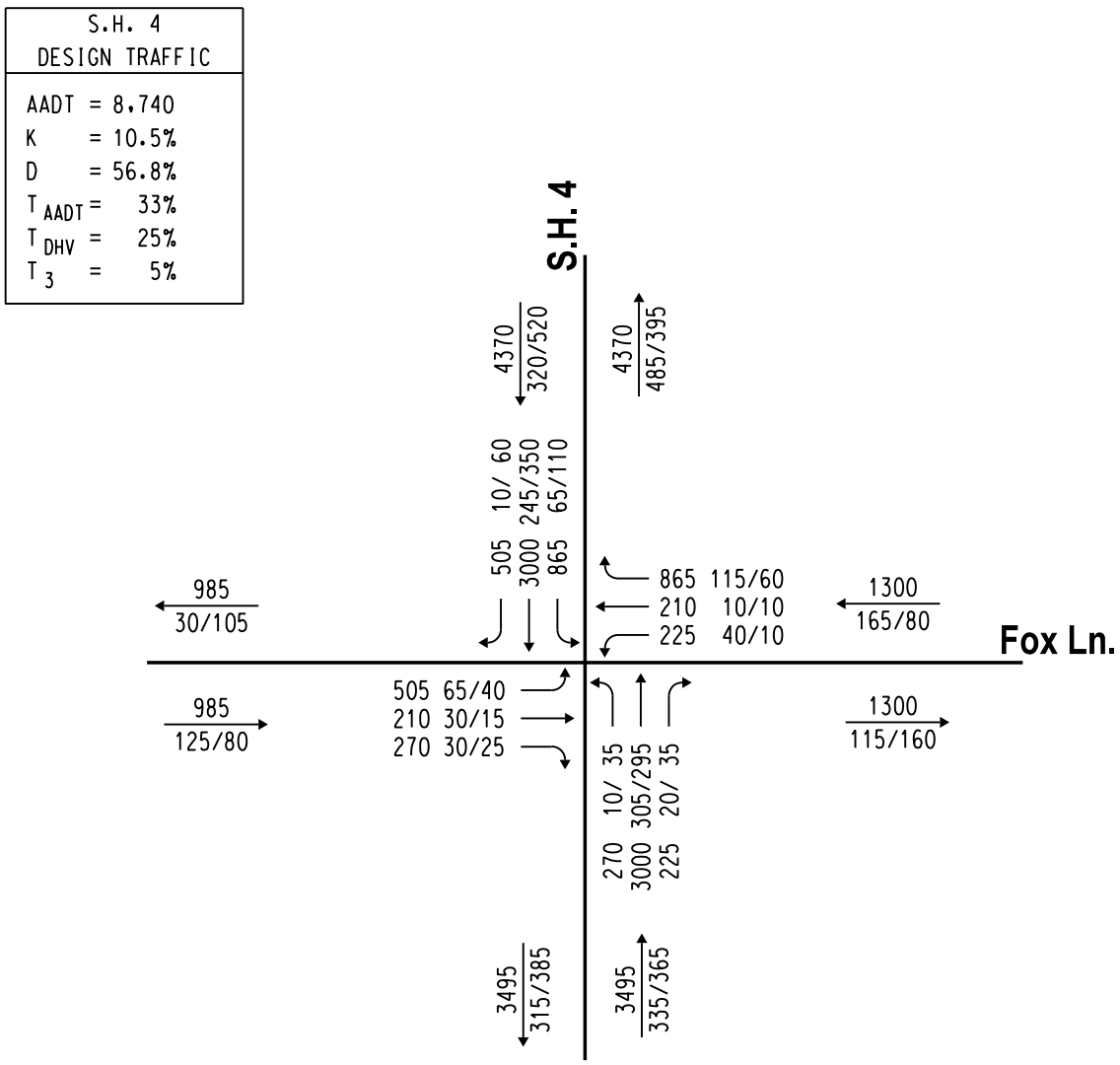


FIGURE 1. 2019 Turning Movement Traffic Data (Data Collected 04-09-19)



LEGEND

XXXX XXX/XXX

AADT

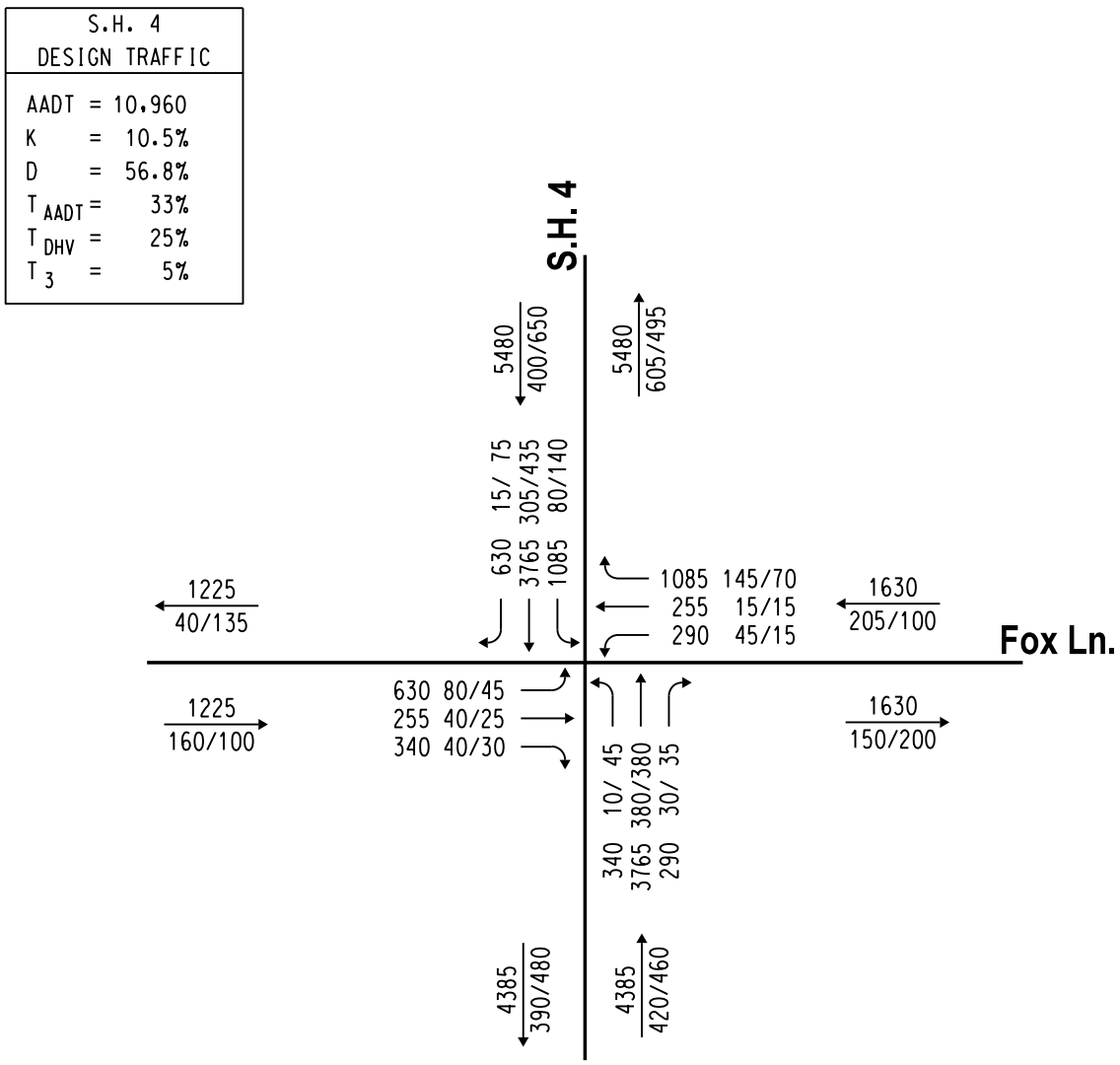
A.M. PEAK HOUR

P.M. PEAK HOUR

FIGURE 2. 2021 Design Traffic Data
Existing Configuration

04/26/21 G:\0IProjects\17-2850 - Traffic Analysis, CI-2270A, SH-4 at Fox Lane (EW 122) - Grady County, OK\CAD\FIG 2.dgn

TEC
A CLEAR DIRECTION



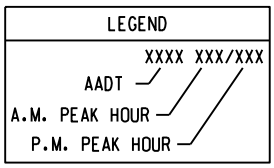
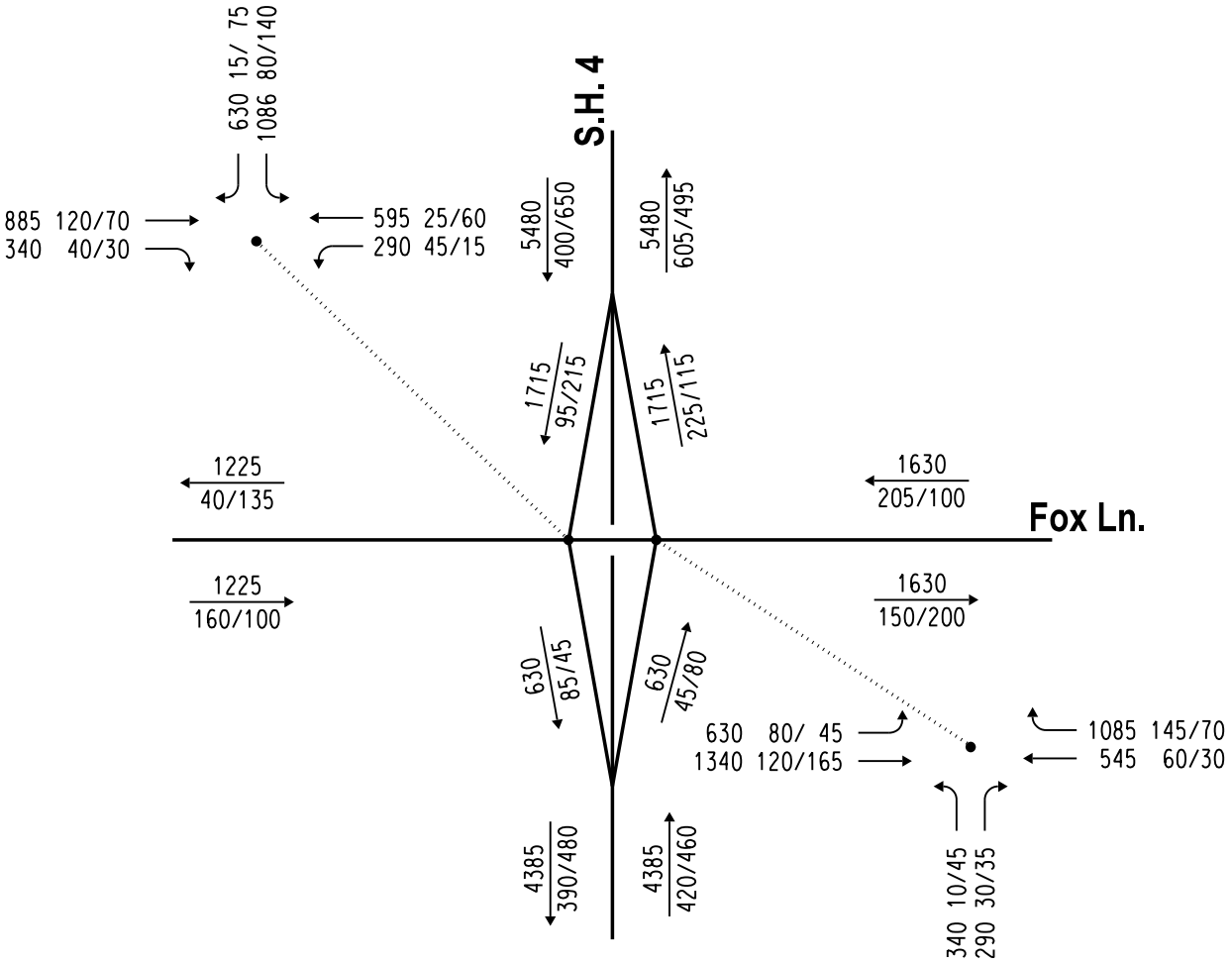


FIGURE 3. 2030 Design Traffic Data
Existing Configuration



LEGEND

XXXX XXX/XXX

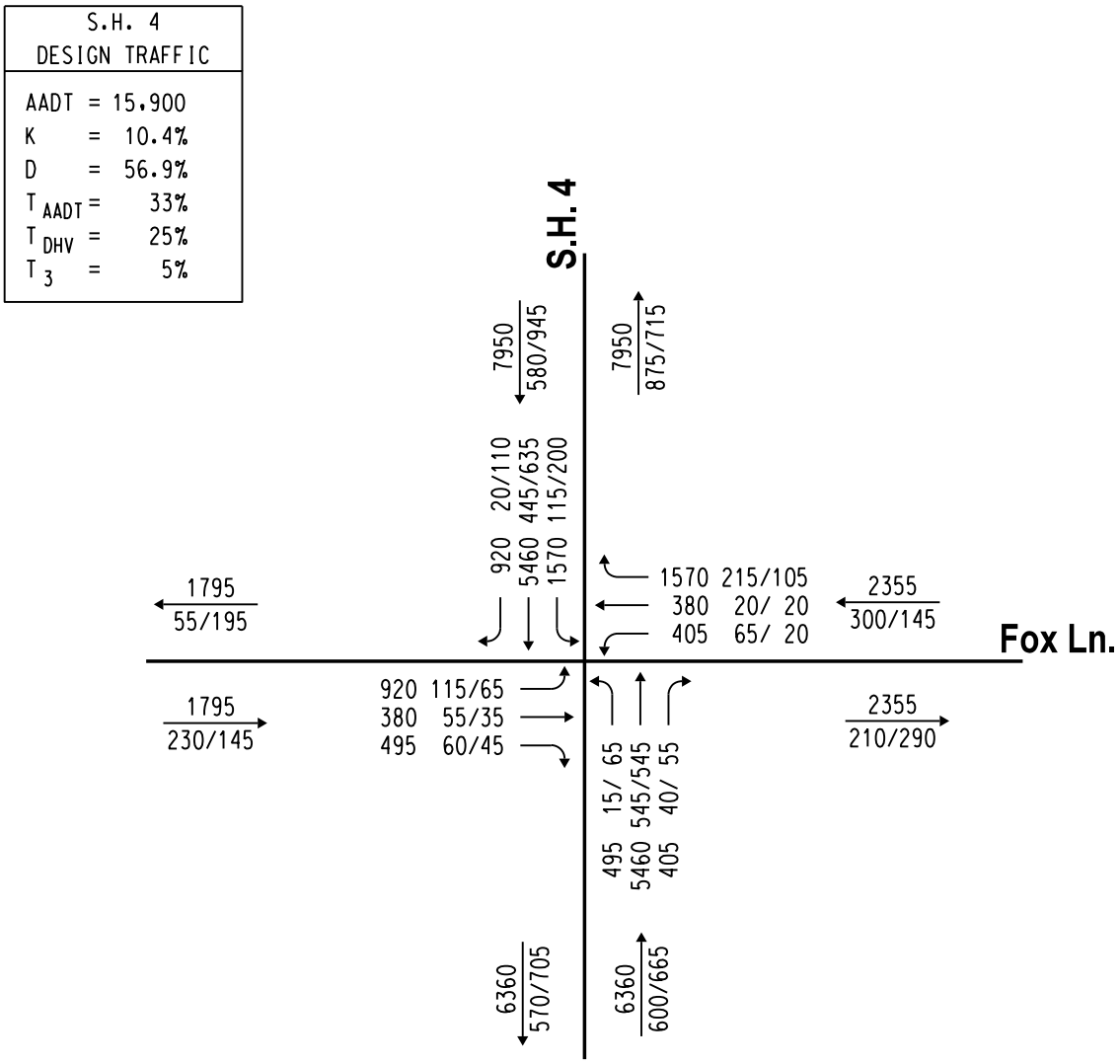
AADT

A.M. PEAK HOUR

P.M. PEAK HOUR

FIGURE 4. 2030 Design Traffic Data
Grade Separated Diamond

09/10/21 G:\0IProjects\17-2850 - Traffic Analysis, CI-2270A, SH-4 at Fox Lane (EW 122) - Grady County, OK\CAD\FIG 4.dgn



LEGEND

XXXX XXX/XXX

AADT

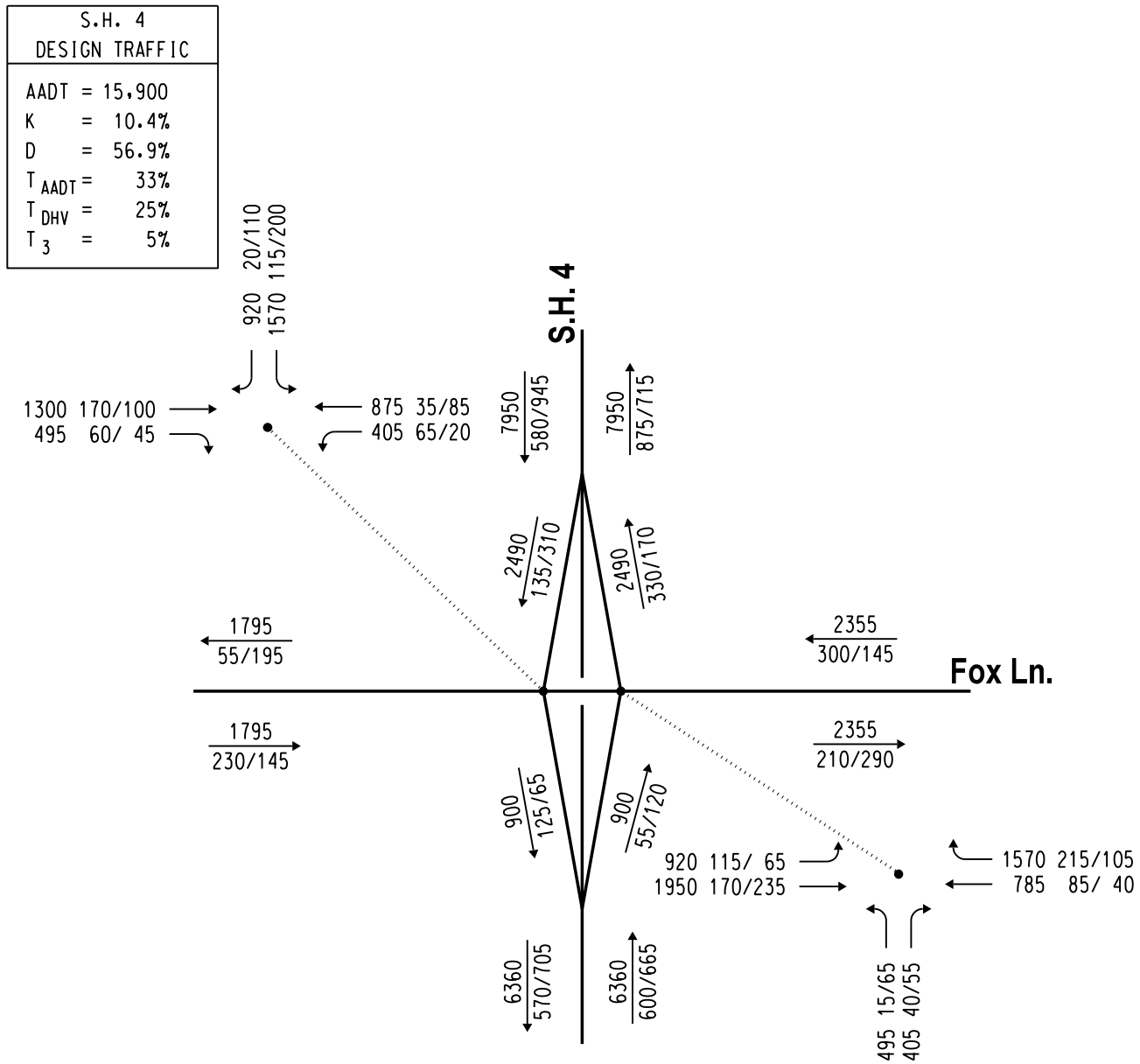
A.M. PEAK HOUR

P.M. PEAK HOUR

FIGURE 5. 2050 Design Traffic Data
Existing Configuration

09/10/21 G:\0IProjects\17-2850 - Traffic Analysis, CI-2270A, SH-4 at Fox Lane (EW 122) - Grady County, OK\CAD\FIG 5.dgn

TEC
A CLEAR DIRECTION



LEGEND

XXXX XXX/XXX

AADT

A.M. PEAK HOUR

P.M. PEAK HOUR

FIGURE 6. 2050 Design Traffic Data
Grade Separated Diamond

09/10/21 G:\0IProjects\T-2850 - Traffic Analysis, CI-2270A, SH-4 at Fox Lane (EW 122) - Grady County, OK\CAD\FIG 6.dgn

TEC
A CLEAR DIRECTION

ATTACHMENT B

ANALYSES RESULTS

TABLE 1

Capacity Analysis Summary

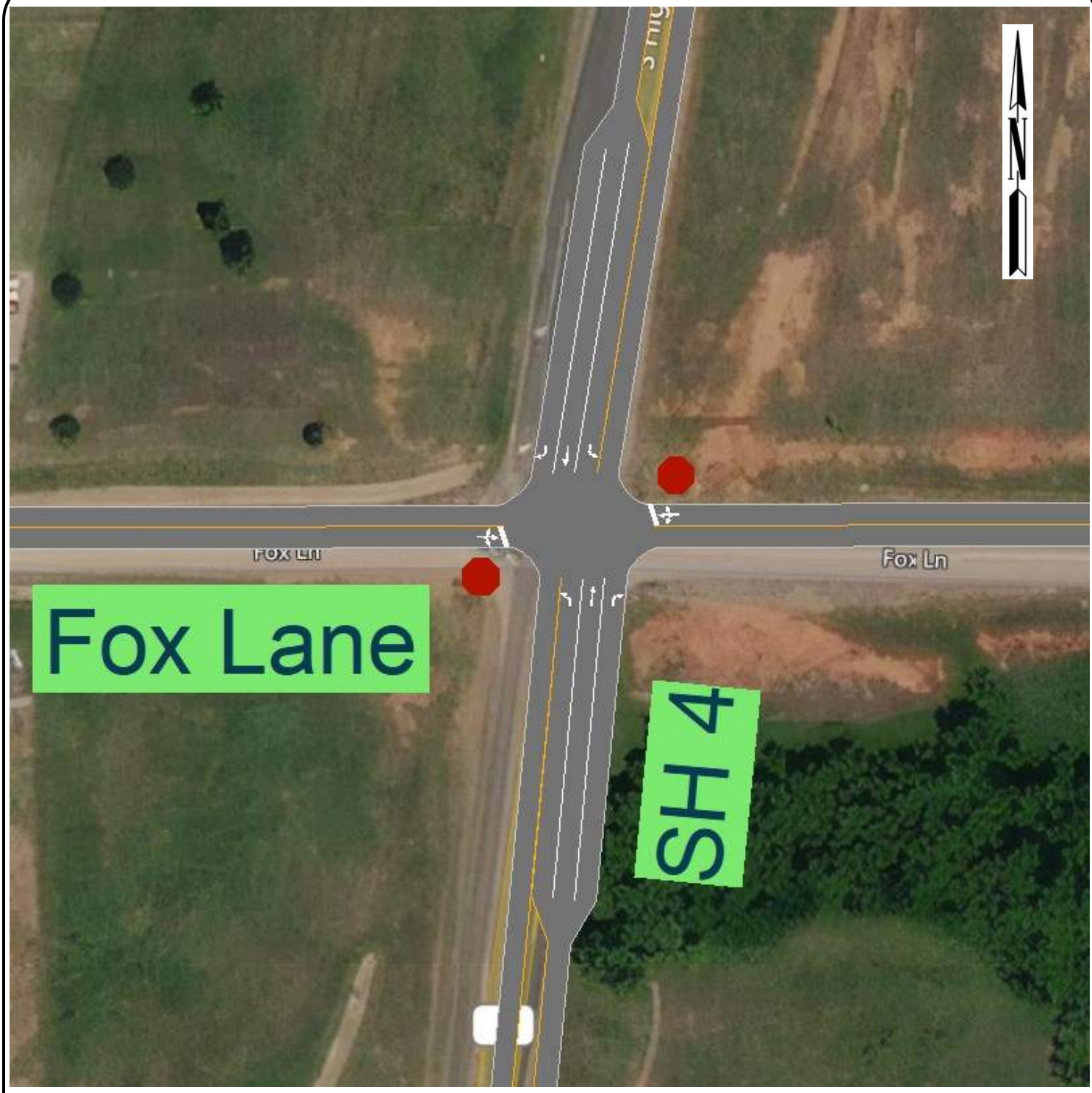
Intersection	Type of Traffic Control	Projection Year	AM Peak Hour					PM Peak Hour				
			Critical Approach			Intersection		Critical Approach			Intersection	
			Approach	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Approach	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Alternate 1A - Existing Geometry												
SH 4 and Fox Lane	Two-Way Stop	2021 Traffic	EB	91.3	F	20.2	*	EB	42.4	E	6.4	*
		2030 Traffic	EB	**	F	116.2	*	EB	200.0	F	22.9	*
		2050 Traffic	EB	**	F	**	*	EB	***	F	281.9	*
Alternate 1B - Existing Geometry with EB / WB Turn Lanes												
SH 4 and Fox Lane	Two-Way Stop	2030 Traffic	EB	60.4	F	12.6	*	EB	75.7	F	9.3	*
		2050 Traffic	EB	**	F	155.3	*	EB	***	F	126.3	*
Alternate 1C - Existing Geometry with EB / WB Turn Lanes and Acceleration Lanes												
SH 4 and Fox Lane	Two-Way Stop	2030 Traffic	EB	36.6	E	7.4	*	EB	75.6	F	7.3	*
		2050 Traffic	WB	**	F	66.7	*	EB	***	F	92.2	*
Alternate 1D - Existing Geometry with Four-Way Stop												
SH 4 and Fox Lane	All-Way Stop	2030 Traffic	NB	53.6	F	34.1	E	SB	38.5	E	32.9	D
		2050 Traffic	NB	280.7	F	160.8	F	SB	184.2	F	150.1	F
Alternate 1E - Signalized with Improved Geometry												
SH 4 and Fox Lane	Signalized	2030 Traffic	WB	29.0	C	21.7	C	WB	30.5	C	22.6	C
		2050 Traffic	WB	37.1	D	32.3	C	WB	45.3	D	35.8	D
Alternate 2A - Roundabout												
SH 4 and Fox Lane	Roundabout	2030 Traffic	NB	12.4	B	10.1	B	SB	17.0	C	14.8	B
		2050 Traffic	NB	36.0	E	23.8	C	SB	86.4	F	68.0	F
Alternate 2B - Roundabout with Bypass Lanes												
SH 4 and Fox Lane	Roundabout	2030 Traffic	NB	10.9	B	9.4	A	SB	17.0	C	13.9	B
		2050 Traffic	NB	27.0	D	20.1	C	SB	86.4	F	52.9	F
Alternate 3A - Diamond Interchange - Fox Lane Over - 575 Foot Intersection Spacing												
SH 4 West Ramp and Fox Lane	One-Way Stop	2050 Traffic	SB	12.7	B	4.8	*	SB	13.0	B	7.5	*
SH 4 East Ramp and Fox Lane	One-Way Stop	2050 Traffic	NB	12.1	B	2.5	*	NB	14.0	B	3.8	*
Alternate 3B - Diamond Interchange - SH 4 Over / Existing Alignment - 455 Foot Intersection Spacing												
SH 4 West Ramp and Fox Lane	One-Way Stop	2050 Traffic	SB	12.7	B	4.8	*	SB	13.0	B	7.5	*
SH 4 East Ramp and Fox Lane	One-Way Stop	2050 Traffic	NB	12.1	B	2.5	*	NB	14.0	B	3.8	*
Alternate 3C/D - Diamond Interchange - SH 4 Over / Offset Alignment - 320 Foot Intersection Spacing												
SH 4 West Ramp and Fox Lane	One-Way Stop	2050 Traffic	SB	12.7	B	4.8	*	SB	13.0	B	7.5	*
SH 4 East Ramp and Fox Lane	One-Way Stop	2050 Traffic	NB	12.1	B	2.5	*	NB	14.0	B	3.8	*
Alternate 3E - Diamond Interchange - SH 4 Over / Offset Alignment / Roundabouts - 320 Foot Intersection Spacing												
SH 4 West Ramp and Fox Lane	Roundabout	2050 Traffic	EB	5.3	A	4.5	A	SB	5.5	A	4.9	A
SH 4 East Ramp and Fox Lane	Roundabout	2050 Traffic	WB	6.1	A	5.5	A	NB	6.6	A	5.2	A

** - No overall intersection level of service reported due to lack of control on all movements at the intersection.*

*** - Delay exceeds 300 seconds/vehicle.*

ATTACHMENT C

SYNCHRO OUTPUT / INTERSECTION GEOMETRICS



Alternate 1A - Fox Ln. & SH 4

Grady County, Oklahoma

TEC
A CLEAR DIRECTION

Intersection	
Int Delay, s/veh	20.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	30	30	40	10	115	10	305	20	65	245	10
Future Vol, veh/h	65	30	30	40	10	115	10	305	20	65	245	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	175	-	175	180	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	67	82	67	39	73	62	82	71	59	85	47
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	90	45	37	60	26	158	16	372	28	110	288	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1018	940	288	964	933	372	309	0	0	400	0	0
Stage 1	508	508	-	404	404	-	-	-	-	-	-	-
Stage 2	510	432	-	560	529	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.35	-	-	4.35	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.425	-	-	2.425	-	-
Pot Cap-1 Maneuver	215	263	749	234	265	672	1132	-	-	1044	-	-
Stage 1	546	537	-	621	597	-	-	-	-	-	-	-
Stage 2	544	581	-	511	526	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	137	232	749	173	234	672	1132	-	-	1044	-	-
Mov Cap-2 Maneuver	137	232	-	173	234	-	-	-	-	-	-	-
Stage 1	538	481	-	612	589	-	-	-	-	-	-	-
Stage 2	393	573	-	394	471	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	91.3	35.1	0.3	2.3
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1132	-	-	191	352	1044	-	-
HCM Lane V/C Ratio	0.014	-	-	0.899	0.69	0.106	-	-
HCM Control Delay (s)	8.2	-	-	91.3	35.1	8.9	-	-
HCM Lane LOS	A	-	-	F	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	6.9	4.9	0.4	-	-

Intersection	
Int Delay, s/veh	116.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑	↱	↰	↑	↱
Traffic Vol, veh/h	80	40	40	45	15	145	10	380	30	80	305	15
Future Vol, veh/h	80	40	40	45	15	145	10	380	30	80	305	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	175	-	175	180	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	67	82	67	39	73	62	82	71	59	85	47
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	111	60	49	67	38	199	16	463	42	136	359	32

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1266	1168	359	1197	1158	463	391	0	0	505	0	0
Stage 1	631	631	-	495	495	-	-	-	-	-	-	-
Stage 2	635	537	-	702	663	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.35	-	-	4.35	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.425	-	-	2.425	-	-
Pot Cap-1 Maneuver	145	193	683	162	195	597	1053	-	-	951	-	-
Stage 1	467	473	-	555	544	-	-	-	-	-	-	-
Stage 2	465	521	-	427	457	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 70	163	683	96	165	597	1053	-	-	951	-	-
Mov Cap-2 Maneuver	~ 70	163	-	96	165	-	-	-	-	-	-	-
Stage 1	460	405	-	547	536	-	-	-	-	-	-	-
Stage 2	284	513	-	290	392	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 561.6	190.6	0.3	2.4
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1053	-	-	108	240	951	-	-
HCM Lane V/C Ratio	0.015	-	-	2.033	1.268	0.143	-	-
HCM Control Delay (s)	8.5	-	-	$ 561.6	190.6	9.4	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	18.4	15.4	0.5	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	426.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	115	55	60	65	20	215	15	545	40	115	445	20
Future Vol, veh/h	115	55	60	65	20	215	15	545	40	115	445	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	175	-	175	180	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	135	65	71	76	24	253	17	619	45	131	506	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1582	1466	506	1501	1444	619	529	0	0	664	0	0
Stage 1	768	768	-	653	653	-	-	-	-	-	-	-
Stage 2	814	698	-	848	791	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.35	-	-	4.35	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.425	-	-	2.425	-	-
Pot Cap-1 Maneuver	~ 88	127	564	100	131	487	931	-	-	825	-	-
Stage 1	393	409	-	455	462	-	-	-	-	-	-	-
Stage 2	370	441	-	355	400	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 31	105	564	~ 39	108	487	931	-	-	825	-	-
Mov Cap-2 Maneuver	~ 31	105	-	~ 39	108	-	-	-	-	-	-	-
Stage 1	386	344	-	447	454	-	-	-	-	-	-	-
Stage 2	166	433	-	212	336	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, $	2001.3	$ 836.3	0.2	2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	931	-	-	53	131	825	-	-
HCM Lane V/C Ratio	0.018	-	-	5.105	2.694	0.158	-	-
HCM Control Delay (s)	8.9	-	-	$ 2001.3	$ 836.3	10.2	-	-
HCM Lane LOS	A	-	-	F	F	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	30.5	31.9	0.6	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	15	25	10	10	60	35	295	35	110	350	60
Future Vol, veh/h	40	15	25	10	10	60	35	295	35	110	350	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	175	-	175	180	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	85	84	55	70	90	79	90	78	80	91	78
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	47	18	30	18	14	67	44	328	45	138	385	77

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1140	1122	385	1140	1154	328	462	0	0	373	0	0
Stage 1	661	661	-	416	416	-	-	-	-	-	-	-
Stage 2	479	461	-	724	738	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.35	-	-	4.35	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.425	-	-	2.425	-	-
Pot Cap-1 Maneuver	177	205	660	177	196	711	988	-	-	1070	-	-
Stage 1	450	458	-	612	590	-	-	-	-	-	-	-
Stage 2	566	564	-	415	423	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	131	171	660	136	163	711	988	-	-	1070	-	-
Mov Cap-2 Maneuver	131	171	-	136	163	-	-	-	-	-	-	-
Stage 1	430	399	-	584	563	-	-	-	-	-	-	-
Stage 2	478	539	-	330	368	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	42.2	21.6	0.9	2
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	988	-	-	187	315	1070	-	-
HCM Lane V/C Ratio	0.045	-	-	0.502	0.315	0.129	-	-
HCM Control Delay (s)	8.8	-	-	42.2	21.6	8.9	-	-
HCM Lane LOS	A	-	-	E	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.5	1.3	0.4	-	-

Intersection	
Int Delay, s/veh	22.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	25	30	15	15	70	45	380	35	140	435	75
Future Vol, veh/h	45	25	30	15	15	70	45	380	35	140	435	75
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	175	-	175	180	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	85	84	55	70	90	79	90	78	80	91	78
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	52	29	36	27	21	78	57	422	45	175	478	96

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1436	1409	478	1445	1460	422	574	0	0	467	0	0
Stage 1	828	828	-	536	536	-	-	-	-	-	-	-
Stage 2	608	581	-	909	924	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.35	-	-	4.35	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.425	-	-	2.425	-	-
Pot Cap-1 Maneuver	111	138	585	109	128	630	895	-	-	984	-	-
Stage 1	364	384	-	527	522	-	-	-	-	-	-	-
Stage 2	481	498	-	328	347	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	67	106	585	67	98	630	895	-	-	984	-	-
Mov Cap-2 Maneuver	67	106	-	67	98	-	-	-	-	-	-	-
Stage 1	341	316	-	493	489	-	-	-	-	-	-	-
Stage 2	377	466	-	230	285	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	200	71.6	1	2.2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	895	-	-	105	169	984	-	-
HCM Lane V/C Ratio	0.064	-	-	1.119	0.748	0.178	-	-
HCM Control Delay (s)	9.3	-	-	200	71.6	9.4	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	7.5	4.7	0.6	-	-

Intersection	
Int Delay, s/veh	281.9

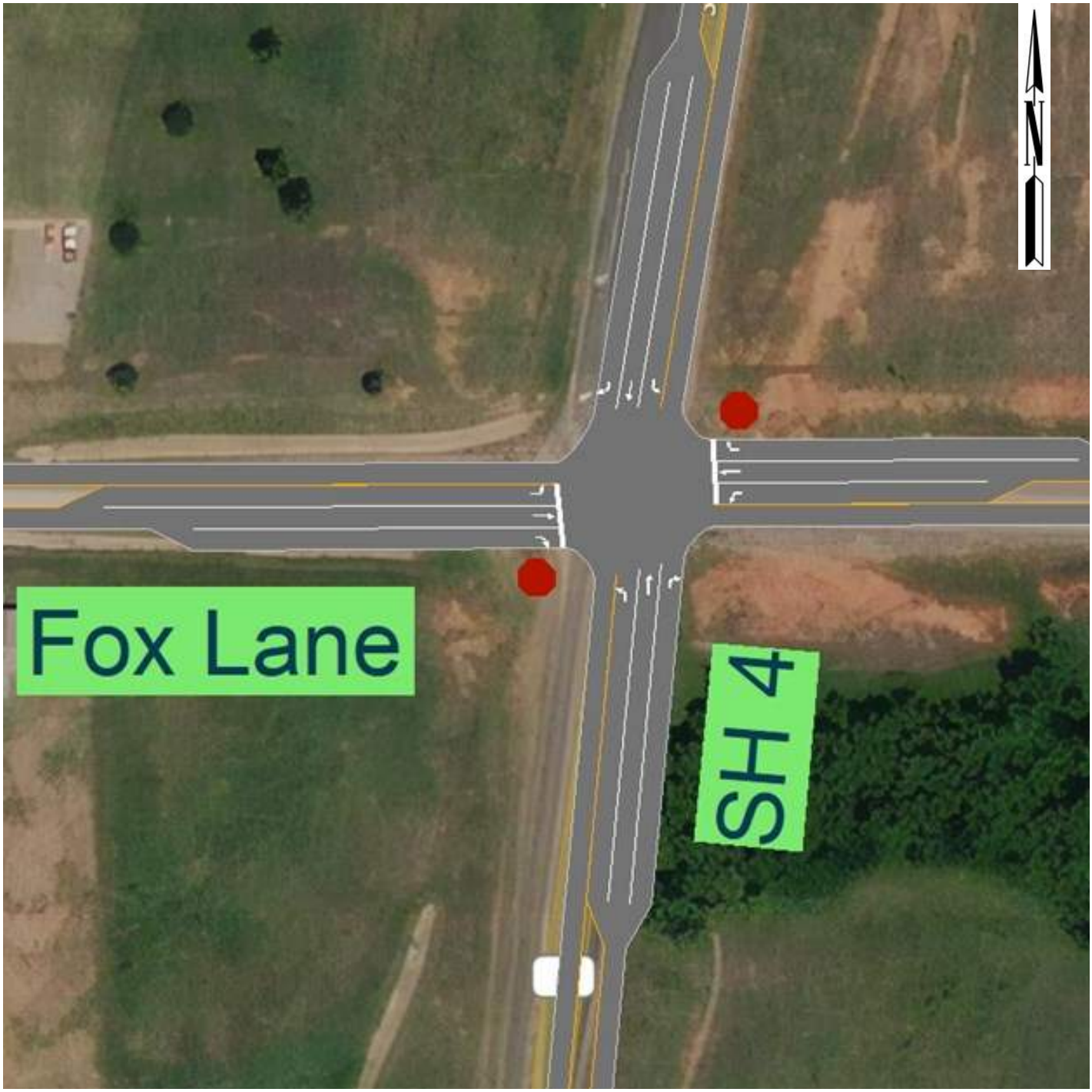
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑	↱	↰	↑	↱
Traffic Vol, veh/h	65	35	45	20	20	105	65	545	55	200	635	110
Future Vol, veh/h	65	35	45	20	20	105	65	545	55	200	635	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	175	-	175	180	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	76	41	53	24	24	124	74	619	63	227	722	125

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2049	2006	722	2053	2068	619	847	0	0	682	0	0
Stage 1	1176	1176	-	767	767	-	-	-	-	-	-	-
Stage 2	873	830	-	1286	1301	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.35	-	-	4.35	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.425	-	-	2.425	-	-
Pot Cap-1 Maneuver	~ 41	59	425	41	54	487	700	-	-	812	-	-
Stage 1	232	264	-	393	410	-	-	-	-	-	-	-
Stage 2	343	383	-	201	230	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 11	~ 38	425	-	35	487	700	-	-	812	-	-
Mov Cap-2 Maneuver	~ 11	~ 38	-	-	35	-	-	-	-	-	-	-
Stage 1	207	190	-	351	367	-	-	-	-	-	-	-
Stage 2	214	342	-	99	166	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, $	3566.7		1.1	2.4
HCM LOS	F	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	700	-	-	21	-	812	-	-
HCM Lane V/C Ratio	0.106	-	-	8.123	-	0.28	-	-
HCM Control Delay (s)	10.7	-	-	$ 3566.7	-	11.1	-	-
HCM Lane LOS	B	-	-	F	-	B	-	-
HCM 95th %tile Q(veh)	0.4	-	-	21.7	-	1.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Alternate 1B - Fox Ln. & SH 4

Grady County, Oklahoma

TEC
A CLEAR DIRECTION

Intersection	
Int Delay, s/veh	12.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	80	40	40	45	15	145	10	380	30	80	305	15
Future Vol, veh/h	80	40	40	45	15	145	10	380	30	80	305	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	200	150	-	200	175	-	175	180	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	94	47	47	53	18	171	11	432	34	91	347	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1095	1017	347	1039	1000	432	364	0	0	466	0	0
Stage 1	529	529	-	454	454	-	-	-	-	-	-	-
Stage 2	566	488	-	585	546	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.35	-	-	4.35	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.425	-	-	2.425	-	-
Pot Cap-1 Maneuver	190	237	694	208	242	621	1078	-	-	985	-	-
Stage 1	531	526	-	584	568	-	-	-	-	-	-	-
Stage 2	507	548	-	495	516	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	119	213	694	149	218	621	1078	-	-	985	-	-
Mov Cap-2 Maneuver	119	213	-	149	218	-	-	-	-	-	-	-
Stage 1	526	478	-	578	562	-	-	-	-	-	-	-
Stage 2	353	543	-	378	469	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	60.4	20.1	0.2	1.8
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1078	-	-	119	213	694	149	218	621	985	-	-
HCM Lane V/C Ratio	0.011	-	-	0.791	0.221	0.068	0.355	0.081	0.275	0.092	-	-
HCM Control Delay (s)	8.4	-	-	102.1	26.6	10.6	41.9	23	13	9	-	-
HCM Lane LOS	A	-	-	F	D	B	E	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	4.6	0.8	0.2	1.5	0.3	1.1	0.3	-	-

Intersection	
Int Delay, s/veh	155.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	115	55	60	65	20	215	15	545	40	115	445	20
Future Vol, veh/h	115	55	60	65	20	215	15	545	40	115	445	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	200	150	-	200	175	-	175	180	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	135	65	71	76	24	253	17	619	45	131	506	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1582	1466	506	1501	1444	619	529	0	0	664	0	0
Stage 1	768	768	-	653	653	-	-	-	-	-	-	-
Stage 2	814	698	-	848	791	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.35	-	-	4.35	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.425	-	-	2.425	-	-
Pot Cap-1 Maneuver	~ 88	127	564	100	131	487	931	-	-	825	-	-
Stage 1	393	409	-	455	462	-	-	-	-	-	-	-
Stage 2	370	441	-	355	400	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 31	105	564	~ 39	108	487	931	-	-	825	-	-
Mov Cap-2 Maneuver	~ 31	105	-	~ 39	108	-	-	-	-	-	-	-
Stage 1	386	344	-	447	454	-	-	-	-	-	-	-
Stage 2	166	433	-	212	336	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 909.7	163.1	0.2	2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	931	-	-	31	105	564	39	108	487	825	-	-
HCM Lane V/C Ratio	0.018	-	-	4.364	0.616	0.125	1.961	0.218	0.519	0.158	-	-
HCM Control Delay (s)	8.9	-	$	1773.1	83.2	12.3	$ 671.5	47.4	20.1	10.2	-	-
HCM Lane LOS	A	-	-	F	F	B	F	E	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	16.2	3	0.4	8.2	0.8	2.9	0.6	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	9.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	25	30	15	15	70	45	380	35	140	435	75
Future Vol, veh/h	45	25	30	15	15	70	45	380	35	140	435	75
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	200	150	-	200	175	-	175	180	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	53	29	35	18	18	82	51	432	40	159	494	85

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1416	1386	494	1421	1431	432	579	0	0	472	0	0
Stage 1	812	812	-	534	534	-	-	-	-	-	-	-
Stage 2	604	574	-	887	897	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.35	-	-	4.35	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.425	-	-	2.425	-	-
Pot Cap-1 Maneuver	114	142	573	113	134	621	891	-	-	980	-	-
Stage 1	371	391	-	528	523	-	-	-	-	-	-	-
Stage 2	484	502	-	337	357	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	73	112	573	71	106	621	891	-	-	980	-	-
Mov Cap-2 Maneuver	73	112	-	71	106	-	-	-	-	-	-	-
Stage 1	350	328	-	498	493	-	-	-	-	-	-	-
Stage 2	382	473	-	241	299	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	75.7	25.8	0.9	2
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	891	-	-	73	112	573	71	106	621	980	-	-
HCM Lane V/C Ratio	0.057	-	-	0.725	0.263	0.062	0.249	0.166	0.133	0.162	-	-
HCM Control Delay (s)	9.3	-	-	133.6	48.2	11.7	71.7	45.6	11.7	9.4	-	-
HCM Lane LOS	A	-	-	F	E	B	F	E	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	3.4	1	0.2	0.9	0.6	0.5	0.6	-	-

Intersection	
Int Delay, s/veh	126.3

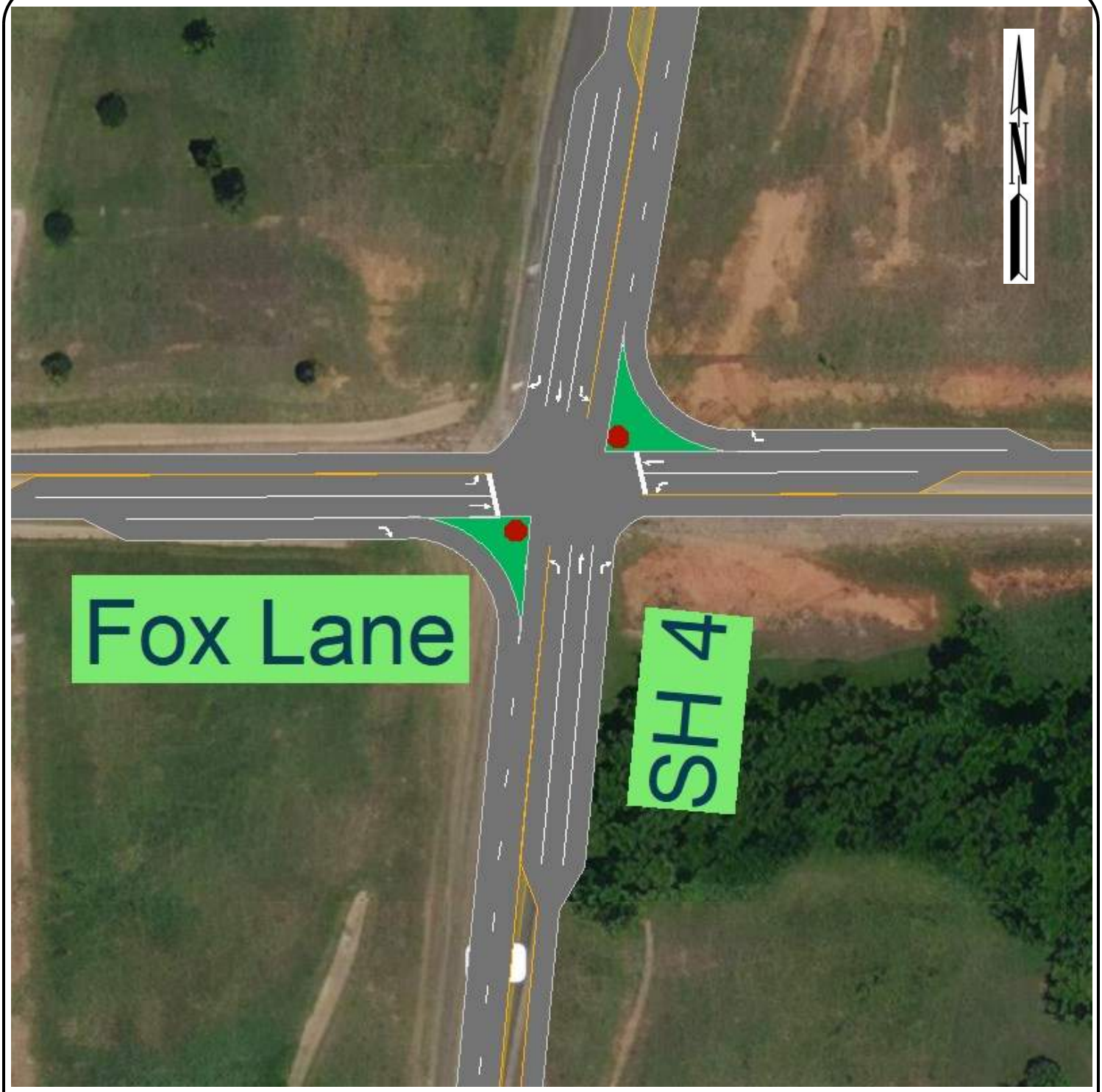
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	35	45	20	20	105	65	545	55	200	635	110
Future Vol, veh/h	65	35	45	20	20	105	65	545	55	200	635	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	200	150	-	200	175	-	175	180	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	76	41	53	24	24	124	74	619	63	227	722	125

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2049	2006	722	2053	2068	619	847	0	0	682	0	0
Stage 1	1176	1176	-	767	767	-	-	-	-	-	-	-
Stage 2	873	830	-	1286	1301	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.35	-	-	4.35	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.425	-	-	2.425	-	-
Pot Cap-1 Maneuver	~ 41	59	425	41	54	487	700	-	-	812	-	-
Stage 1	232	264	-	393	410	-	-	-	-	-	-	-
Stage 2	343	383	-	201	230	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 11	~ 38	425	-	35	487	700	-	-	812	-	-
Mov Cap-2 Maneuver	~ 11	~ 38	-	-	35	-	-	-	-	-	-	-
Stage 1	207	190	-	351	367	-	-	-	-	-	-	-
Stage 2	214	342	-	99	166	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, $	1586.9		1.1	2.4
HCM LOS	F	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	700	-	-	11	38	425	-	35	487	812	-	-
HCM Lane V/C Ratio	0.106	-	-	6.952	1.084	0.125	-	0.672	0.254	0.28	-	-
HCM Control Delay (s)	10.7	-	-	$ 3349.9	$ 334.3	14.7	-	225.3	14.9	11.1	-	-
HCM Lane LOS	B	-	-	F	F	B	-	F	B	B	-	-
HCM 95th %tile Q(veh)	0.4	-	-	10.8	4.1	0.4	-	2.3	1	1.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Alternate 1C - Fox Ln. & SH 4

Grady County, Oklahoma

TEC
A CLEAR DIRECTION

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	80	40	40	45	15	145	10	380	30	80	305	15
Future Vol, veh/h	80	40	40	45	15	145	10	380	30	80	305	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	Free	-	-	None	-	-	None
Storage Length	250	-	200	150	-	200	175	-	175	180	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	94	47	47	53	18	171	11	432	34	91	347	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1009	1017	-	1015	1000	-	364	0	0	466	0	0
Stage 1	529	529	-	454	454	-	-	-	-	-	-	-
Stage 2	480	488	-	561	546	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	-	7.13	6.53	-	4.35	-	-	4.35	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	-	3.527	4.027	-	2.425	-	-	2.425	-	-
Pot Cap-1 Maneuver	218	237	0	216	242	0	1078	-	-	985	-	-
Stage 1	531	526	0	584	568	0	-	-	-	-	-	-
Stage 2	565	548	0	510	516	0	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	189	213	-	166	218	-	1078	-	-	985	-	-
Mov Cap-2 Maneuver	189	213	-	166	218	-	-	-	-	-	-	-
Stage 1	526	478	-	578	562	-	-	-	-	-	-	-
Stage 2	542	543	-	417	469	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	36.6	33.1	0.2	1.8
HCM LOS	E	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	1078	-	-	189	213	-	166	218	-	985	-	-
HCM Lane V/C Ratio	0.011	-	-	0.498	0.221	-	0.319	0.081	-	0.092	-	-
HCM Control Delay (s)	8.4	-	-	41.6	26.6	0	36.5	23	0	9	-	-
HCM Lane LOS	A	-	-	E	D	A	E	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	2.5	0.8	-	1.3	0.3	-	0.3	-	-

Intersection	
Int Delay, s/veh	66.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	115	55	60	65	20	215	15	545	40	115	445	20
Future Vol, veh/h	115	55	60	65	20	215	15	545	40	115	445	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	Free	-	-	None	-	-	None
Storage Length	250	-	200	150	-	200	175	-	175	180	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	135	65	71	76	24	253	17	619	45	131	506	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1456	1466	-	1465	1444	-	529	0	0	664	0	0
Stage 1	768	768	-	653	653	-	-	-	-	-	-	-
Stage 2	688	698	-	812	791	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	-	7.13	6.53	-	4.35	-	-	4.35	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	-	3.527	4.027	-	2.425	-	-	2.425	-	-
Pot Cap-1 Maneuver	~ 107	127	0	106	131	0	931	-	-	825	-	-
Stage 1	393	409	0	455	462	0	-	-	-	-	-	-
Stage 2	435	441	0	371	400	0	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 78	105	-	~ 47	108	-	931	-	-	825	-	-
Mov Cap-2 Maneuver	~ 78	105	-	~ 47	108	-	-	-	-	-	-	-
Stage 1	386	344	-	447	454	-	-	-	-	-	-	-
Stage 2	405	433	-	253	336	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 343.6	$ 392.2	0.2	2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	931	-	-	78	105	-	47	108	-	825	-	-
HCM Lane V/C Ratio	0.018	-	-	1.735	0.616	-	1.627	0.218	-	0.158	-	-
HCM Control Delay (s)	8.9	-	-	$ 468.1	83.2	0	$ 498.3	47.4	0	10.2	-	-
HCM Lane LOS	A	-	-	F	F	A	F	E	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	11.6	3	-	7.5	0.8	-	0.6	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	25	30	15	15	70	45	380	35	140	435	75
Future Vol, veh/h	45	25	30	15	15	70	45	380	35	140	435	75
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	Free	-	-	None	-	-	None
Storage Length	250	-	200	150	-	200	175	-	175	180	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	53	29	35	18	18	82	51	432	40	159	494	85

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1375	1386	-	1403	1431	-	579	0	0	472	0	0
Stage 1	812	812	-	534	534	-	-	-	-	-	-	-
Stage 2	563	574	-	869	897	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	-	7.13	6.53	-	4.35	-	-	4.35	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	-	3.527	4.027	-	2.425	-	-	2.425	-	-
Pot Cap-1 Maneuver	122	142	0	117	134	0	891	-	-	980	-	-
Stage 1	371	391	0	528	523	0	-	-	-	-	-	-
Stage 2	509	502	0	345	357	0	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	90	112	-	79	106	-	891	-	-	980	-	-
Mov Cap-2 Maneuver	90	112	-	79	106	-	-	-	-	-	-	-
Stage 1	350	328	-	498	493	-	-	-	-	-	-	-
Stage 2	463	473	-	263	299	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	75.6	54.4	0.9	2
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	891	-	-	90	112	-	79	106	-	980	-	-
HCM Lane V/C Ratio	0.057	-	-	0.588	0.263	-	0.223	0.166	-	0.162	-	-
HCM Control Delay (s)	9.3	-	-	90.8	48.2	0	63.2	45.6	0	9.4	-	-
HCM Lane LOS	A	-	-	F	E	A	F	E	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.7	1	-	0.8	0.6	-	0.6	-	-

Intersection	
Int Delay, s/veh	92.2

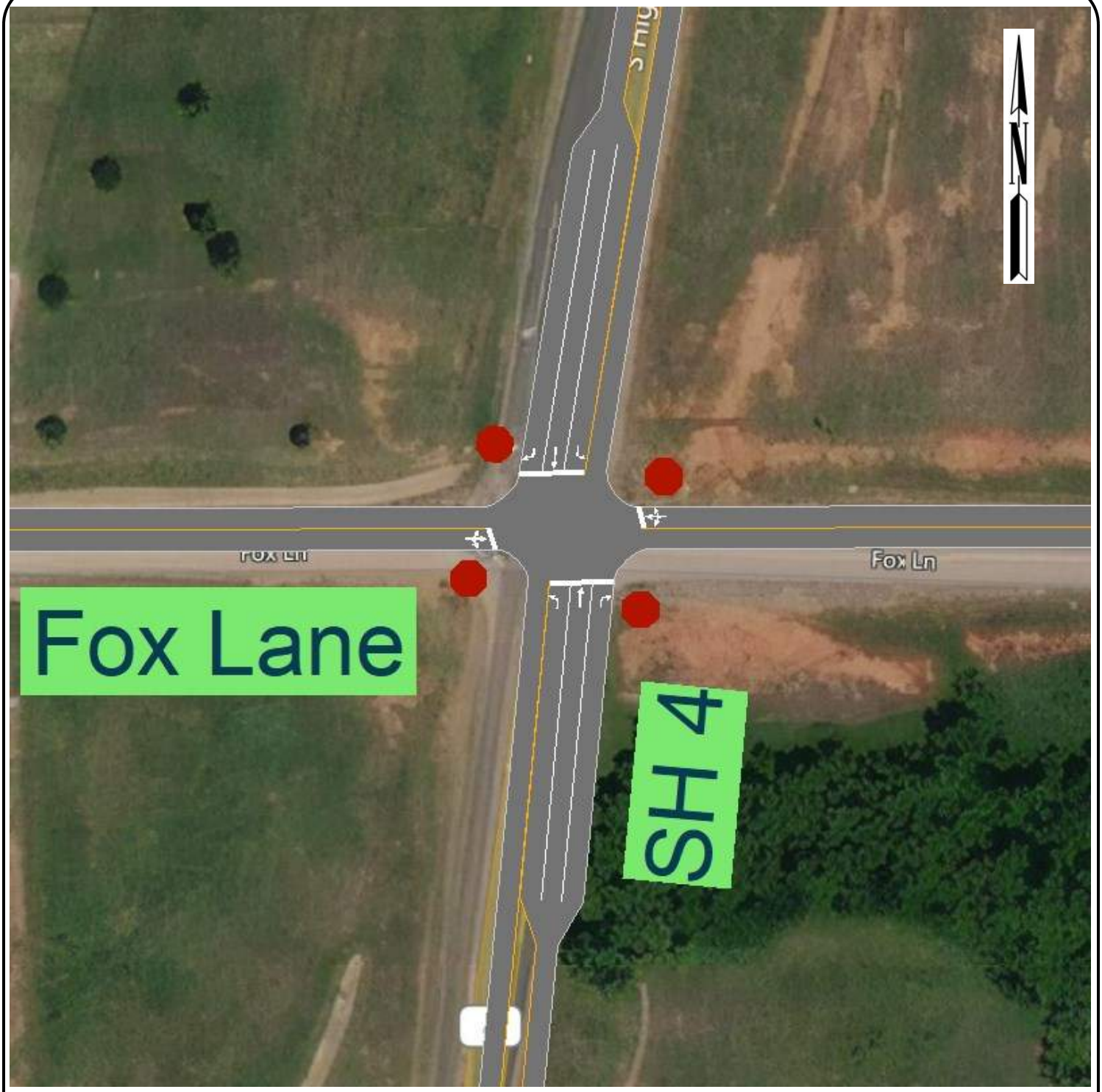
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	35	45	20	20	105	65	545	55	200	635	110
Future Vol, veh/h	65	35	45	20	20	105	65	545	55	200	635	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	Free	-	-	None	-	-	None
Storage Length	250	-	200	150	-	200	175	-	175	180	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	76	41	53	24	24	124	74	619	63	227	722	125

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1987	2006	-	2026	2068	-	847	0	0	682	0	0
Stage 1	1176	1176	-	767	767	-	-	-	-	-	-	-
Stage 2	811	830	-	1259	1301	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	-	7.13	6.53	-	4.35	-	-	4.35	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	-	3.527	4.027	-	2.425	-	-	2.425	-	-
Pot Cap-1 Maneuver	~ 45	59	0	42	54	0	700	-	-	812	-	-
Stage 1	232	264	0	393	410	0	-	-	-	-	-	-
Stage 2	372	383	0	208	230	0	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 16	~ 38	-	-	35	-	700	-	-	812	-	-
Mov Cap-2 Maneuver	~ 16	~ 38	-	-	35	-	-	-	-	-	-	-
Stage 1	207	190	-	351	367	-	-	-	-	-	-	-
Stage 2	311	342	-	117	166	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, $	1533.4		1.1	2.4
HCM LOS	F	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBL	SBT	SBR
Capacity (veh/h)	700	-	-	16	38	-	-	35	-	812	-	-
HCM Lane V/C Ratio	0.106	-	-	4.779	1.084	-	-	0.672	-	0.28	-	-
HCM Control Delay (s)	10.7	-	-	$ 2179	$ 334.3	0	-	225.3	0	11.1	-	-
HCM Lane LOS	B	-	-	F	F	A	-	F	A	B	-	-
HCM 95th %tile Q(veh)	0.4	-	-	10.3	4.1	-	-	2.3	-	1.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Alternate 1D - Fox Ln. & SH 4

Grady County, Oklahoma

TEC
A CLEAR DIRECTION

Intersection	
Intersection Delay, s/veh	34.1
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	80	40	40	45	15	145	10	380	30	80	305	15
Future Vol, veh/h	80	40	40	45	15	145	10	380	30	80	305	15
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	94	47	47	53	18	171	11	432	34	91	347	17
Number of Lanes	0	1	0	0	1	0	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	1
HCM Control Delay	18.1	19.3	53.6	28
HCM LOS	C	C	F	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	50%	22%	100%	0%	0%
Vol Thru, %	0%	100%	0%	25%	7%	0%	100%	0%
Vol Right, %	0%	0%	100%	25%	71%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	380	30	160	205	80	305	15
LT Vol	10	0	0	80	45	80	0	0
Through Vol	0	380	0	40	15	0	305	0
RT Vol	0	0	30	40	145	0	0	15
Lane Flow Rate	11	432	34	188	241	91	347	17
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.027	0.948	0.068	0.447	0.53	0.214	0.768	0.034
Departure Headway (Hd)	8.418	7.9	7.174	8.542	7.906	8.492	7.973	7.246
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	428	462	502	422	456	423	454	493
Service Time	6.118	5.6	4.874	6.303	5.662	6.246	5.726	4.999
HCM Lane V/C Ratio	0.026	0.935	0.068	0.445	0.529	0.215	0.764	0.034
HCM Control Delay	11.4	58.1	10.4	18.1	19.3	13.6	32.7	10.3
HCM Lane LOS	B	F	B	C	C	B	D	B
HCM 95th-tile Q	0.1	11.3	0.2	2.2	3	0.8	6.6	0.1

Intersection	
Intersection Delay, s/veh	160.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	115	55	60	65	20	215	15	545	40	115	445	20
Future Vol, veh/h	115	55	60	65	20	215	15	545	40	115	445	20
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	135	65	71	76	24	253	17	619	45	131	506	23
Number of Lanes	0	1	0	0	1	0	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	1
HCM Control Delay	37.1	50.8	280.7	146.4
HCM LOS	E	F	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	50%	22%	100%	0%	0%
Vol Thru, %	0%	100%	0%	24%	7%	0%	100%	0%
Vol Right, %	0%	0%	100%	26%	72%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	545	40	230	300	115	445	20
LT Vol	15	0	0	115	65	115	0	0
Through Vol	0	545	0	55	20	0	445	0
RT Vol	0	0	40	60	215	0	0	20
Lane Flow Rate	17	619	45	271	353	131	506	23
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.047	1.602	0.109	0.709	0.852	0.355	1.303	0.054
Departure Headway (Hd)	10.445	9.913	9.169	11.207	10.299	11.008	10.472	9.723
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	345	372	393	325	356	329	349	371
Service Time	8.145	7.613	6.869	8.907	7.999	8.708	8.172	7.423
HCM Lane V/C Ratio	0.049	1.664	0.115	0.834	0.992	0.398	1.45	0.062
HCM Control Delay	13.7	307.7	13	37.1	50.8	19.6	185.2	13
HCM Lane LOS	B	F	B	E	F	C	F	B
HCM 95th-tile Q	0.1	33.8	0.4	5.1	7.8	1.6	21	0.2

Intersection	
Intersection Delay, s/veh	32.9
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	25	30	15	15	70	45	380	35	140	435	75
Future Vol, veh/h	45	25	30	15	15	70	45	380	35	140	435	75
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	53	29	35	18	18	82	51	432	40	159	494	85
Number of Lanes	0	1	0	0	1	0	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	1
HCM Control Delay	13.9	13.1	33.6	38.5
HCM LOS	B	B	D	E

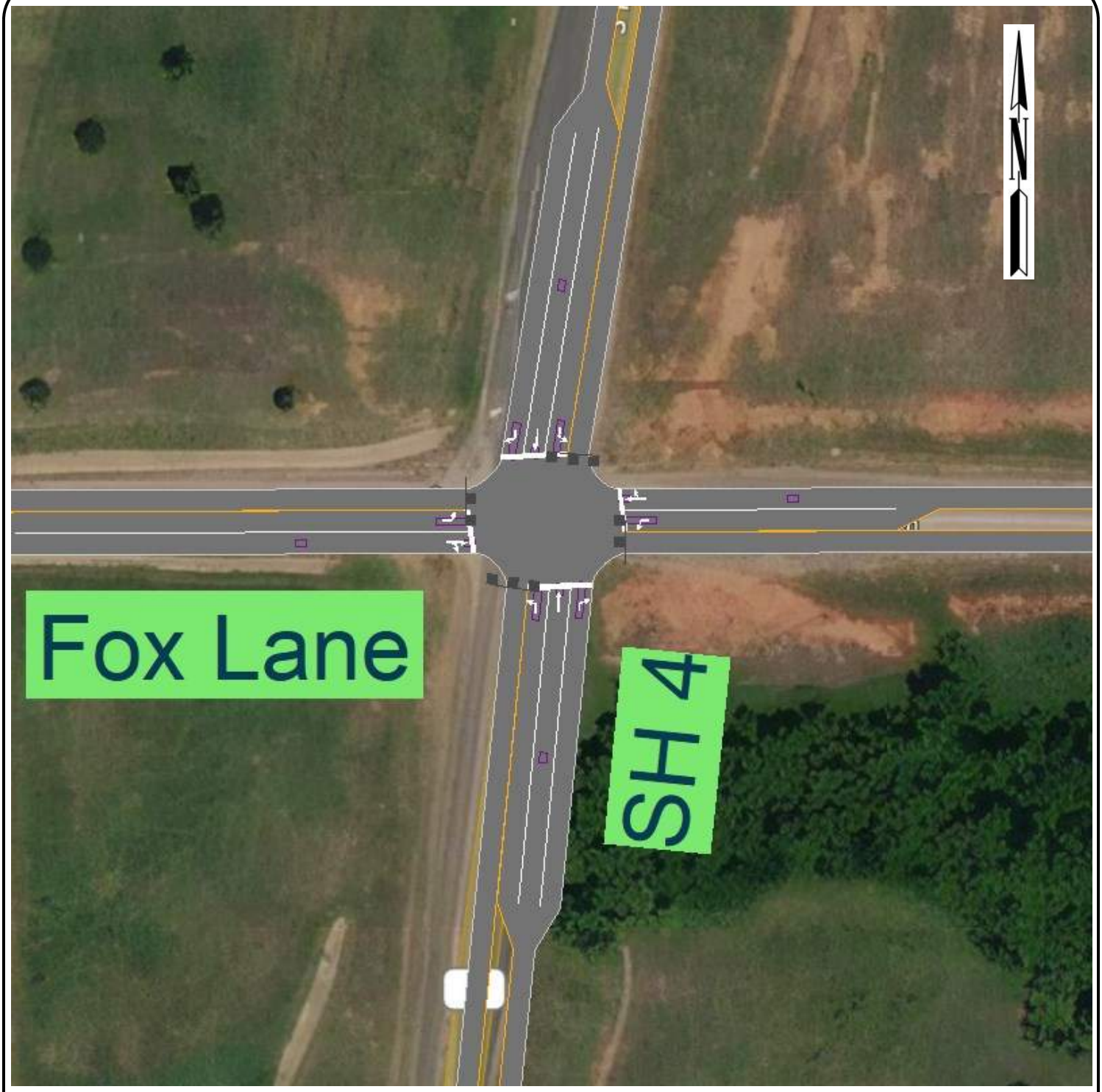
Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	45%	15%	100%	0%	0%
Vol Thru, %	0%	100%	0%	25%	15%	0%	100%	0%
Vol Right, %	0%	0%	100%	30%	70%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	45	380	35	100	100	140	435	75
LT Vol	45	0	0	45	15	140	0	0
Through Vol	0	380	0	25	15	0	435	0
RT Vol	0	0	35	30	70	0	0	75
Lane Flow Rate	51	432	40	118	118	159	494	85
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.108	0.851	0.07	0.267	0.253	0.325	0.94	0.145
Departure Headway (Hd)	7.603	7.092	6.377	8.159	7.745	7.358	6.848	6.133
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	471	510	562	440	464	492	534	588
Service Time	5.345	4.834	4.119	5.909	5.497	5.058	4.548	3.833
HCM Lane V/C Ratio	0.108	0.847	0.071	0.268	0.254	0.323	0.925	0.145
HCM Control Delay	11.3	38.4	9.6	13.9	13.1	13.6	51.5	9.9
HCM Lane LOS	B	E	A	B	B	B	F	A
HCM 95th-tile Q	0.4	8.8	0.2	1.1	1	1.4	11.8	0.5

Intersection	
Intersection Delay, s/veh	150.1
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	35	45	20	20	105	65	545	55	200	635	110
Future Vol, veh/h	65	35	45	20	20	105	65	545	55	200	635	110
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	76	41	53	24	24	124	74	619	63	227	722	125
Number of Lanes	0	1	0	0	1	0	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	1	1
HCM Control Delay	19.2	18	161.1	184.2
HCM LOS	C	C	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	WBLn1	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	45%	14%	100%	0%	0%
Vol Thru, %	0%	100%	0%	24%	14%	0%	100%	0%
Vol Right, %	0%	0%	100%	31%	72%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	65	545	55	145	145	200	635	110
LT Vol	65	0	0	65	20	200	0	0
Through Vol	0	545	0	35	20	0	635	0
RT Vol	0	0	55	45	105	0	0	110
Lane Flow Rate	74	619	62	171	171	227	722	125
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.171	1.344	0.123	0.414	0.395	0.51	1.518	0.239
Departure Headway (Hd)	8.94	8.422	7.696	9.753	9.331	8.632	8.114	7.388
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	404	440	469	372	389	420	455	489
Service Time	6.64	6.122	5.396	7.453	7.031	6.332	5.814	5.088
HCM Lane V/C Ratio	0.183	1.407	0.132	0.46	0.44	0.54	1.587	0.256
HCM Control Delay	13.5	193.8	11.5	19.2	18	20	265.7	12.4
HCM Lane LOS	B	F	B	C	C	C	F	B
HCM 95th-tile Q	0.6	26.5	0.4	2	1.8	2.8	35.8	0.9



Alternate 1E - Fox Ln. & SH 4

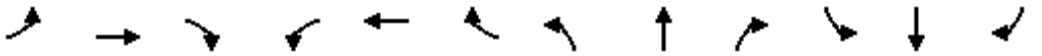
Grady County, Oklahoma

TEC
A CLEAR DIRECTION

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	94	94	53	189	11	432	34	91	347	17
v/c Ratio	0.32	0.30	0.18	0.57	0.08	0.68	0.05	0.47	0.42	0.02
Control Delay	22.6	19.9	20.7	14.7	34.1	27.2	0.2	39.9	14.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	19.9	20.7	14.7	34.1	27.2	0.2	39.9	14.1	0.1
Queue Length 50th (ft)	33	20	18	8	5	162	0	38	75	0
Queue Length 95th (ft)	62	57	39	55	20	#336	0	87	217	0
Internal Link Dist (ft)		2712		3414		1392			1432	
Turn Bay Length (ft)	250		150		175		175	180		175
Base Capacity (vph)	347	752	387	776	227	670	647	227	858	789
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.13	0.14	0.24	0.05	0.64	0.05	0.40	0.40	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



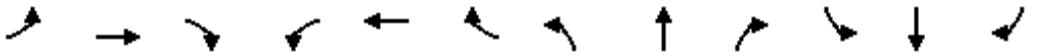
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	40	40	45	15	145	10	380	30	80	305	15
Future Volume (vph)	80	40	40	45	15	145	10	380	30	80	305	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1706		1752	1594		1444	1520	1292	1444	1520	1292
Flt Permitted	0.36	1.00		0.70	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	671	1706		1284	1594		1444	1520	1292	1444	1520	1292
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	94	47	47	53	18	171	11	432	34	91	347	17
RTOR Reduction (vph)	0	40	0	0	151	0	0	0	20	0	0	8
Lane Group Flow (vph)	94	54	0	53	38	0	11	432	14	91	347	9
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	25%	25%	25%	25%	25%	25%
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	17.5	11.0		12.9	8.7		1.2	31.2	31.2	7.0	37.0	37.0
Effective Green, g (s)	17.5	11.0		12.9	8.7		1.2	31.2	31.2	7.0	37.0	37.0
Actuated g/C Ratio	0.24	0.15		0.18	0.12		0.02	0.43	0.43	0.10	0.50	0.50
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	255	255		252	188		23	646	549	137	766	651
v/s Ratio Prot	c0.03	0.03		0.01	0.02		0.01	c0.28		c0.06	0.23	
v/s Ratio Perm	c0.06			0.02					0.01			0.01
v/c Ratio	0.37	0.21		0.21	0.20		0.48	0.67	0.03	0.66	0.45	0.01
Uniform Delay, d1	22.7	27.4		25.7	29.2		35.8	16.9	12.3	32.1	11.7	9.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.4		0.4	0.5		14.8	2.6	0.0	11.5	0.4	0.0
Delay (s)	23.6	27.8		26.1	29.8		50.6	19.6	12.3	43.6	12.1	9.1
Level of Service	C	C		C	C		D	B	B	D	B	A
Approach Delay (s)		25.7			29.0			19.8			18.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	73.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	135	136	76	277	17	619	45	131	506	23
v/c Ratio	0.51	0.47	0.26	0.70	0.16	0.93	0.07	0.78	0.57	0.03
Control Delay	31.9	28.8	26.0	17.1	42.0	46.7	0.2	71.1	17.3	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.9	28.8	26.0	17.1	42.0	46.7	0.2	71.1	17.3	0.1
Queue Length 50th (ft)	58	44	31	12	9	305	0	70	143	0
Queue Length 95th (ft)	98	93	60	70	30	#571	0	#175	#380	0
Internal Link Dist (ft)		2712		3414		1392			1432	
Turn Bay Length (ft)	250		150		175		175	180		175
Base Capacity (vph)	273	565	332	671	167	668	638	167	888	807
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.24	0.23	0.41	0.10	0.93	0.07	0.78	0.57	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



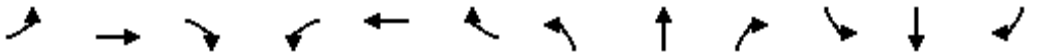
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	55	60	65	20	215	15	545	40	115	445	20
Future Volume (vph)	115	55	60	65	20	215	15	545	40	115	445	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1700		1752	1592		1444	1520	1292	1444	1520	1292
Flt Permitted	0.32	1.00		0.67	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	586	1700		1236	1592		1444	1520	1292	1444	1520	1292
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	135	65	71	76	24	253	17	619	45	131	506	23
RTOR Reduction (vph)	0	43	0	0	225	0	0	0	24	0	0	10
Lane Group Flow (vph)	135	93	0	76	52	0	17	619	21	131	506	13
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	25%	25%	25%	25%	25%	25%
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	21.9	12.6		17.1	10.2		1.6	42.3	42.3	10.0	50.7	50.7
Effective Green, g (s)	21.9	12.6		17.1	10.2		1.6	42.3	42.3	10.0	50.7	50.7
Actuated g/C Ratio	0.24	0.14		0.19	0.11		0.02	0.46	0.46	0.11	0.55	0.55
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	257	233		269	176		25	700	595	157	839	713
v/s Ratio Prot	c0.05	0.05		0.02	0.03		0.01	c0.41		c0.09	0.33	
v/s Ratio Perm	c0.07			0.03					0.02			0.01
v/c Ratio	0.53	0.40		0.28	0.30		0.68	0.88	0.03	0.83	0.60	0.02
Uniform Delay, d1	29.3	36.1		31.8	37.5		44.8	22.5	13.6	40.1	13.8	9.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	1.1		0.6	0.9		56.0	12.8	0.0	30.0	1.2	0.0
Delay (s)	31.2	37.3		32.3	38.4		100.8	35.3	13.6	70.1	15.0	9.3
Level of Service	C	D		C	D		F	D	B	E	B	A
Approach Delay (s)		34.2			37.1			35.5			25.8	
Approach LOS		C			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	91.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	53	64	18	100	51	432	40	159	494	85
v/c Ratio	0.19	0.19	0.07	0.41	0.30	0.65	0.06	0.71	0.56	0.11
Control Delay	21.3	15.5	20.0	16.5	34.7	24.4	0.2	50.5	21.1	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.3	15.5	20.0	16.5	34.7	24.4	0.2	50.5	21.1	1.3
Queue Length 50th (ft)	18	10	6	8	21	158	0	69	181	0
Queue Length 95th (ft)	40	42	19	44	53	#316	0	#175	#387	8
Internal Link Dist (ft)		2712		3414		1392			1432	
Turn Bay Length (ft)	250		150		175		175	180		175
Base Capacity (vph)	349	731	357	726	224	689	661	224	876	803
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.09	0.05	0.14	0.23	0.63	0.06	0.71	0.56	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



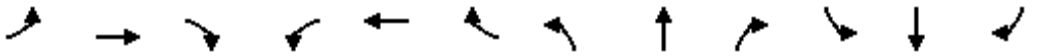
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	25	30	15	15	70	45	380	35	140	435	75
Future Volume (vph)	45	25	30	15	15	70	45	380	35	140	435	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1693		1752	1618		1444	1520	1292	1444	1520	1292
Flt Permitted	0.48	1.00		0.72	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	883	1693		1319	1618		1444	1520	1292	1444	1520	1292
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	53	29	35	18	18	82	51	432	40	159	494	85
RTOR Reduction (vph)	0	30	0	0	74	0	0	0	23	0	0	42
Lane Group Flow (vph)	53	34	0	18	26	0	51	432	17	159	494	43
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	25%	25%	25%	25%	25%	25%
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	15.2	10.7		8.6	7.4		4.7	31.3	31.3	10.3	36.9	36.9
Effective Green, g (s)	15.2	10.7		8.6	7.4		4.7	31.3	31.3	10.3	36.9	36.9
Actuated g/C Ratio	0.21	0.15		0.12	0.10		0.06	0.43	0.43	0.14	0.50	0.50
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	235	246		161	162		92	647	550	202	763	648
v/s Ratio Prot	c0.01	0.02		0.00	0.02		0.04	0.28		c0.11	c0.33	
v/s Ratio Perm	c0.03			0.01					0.01			0.03
v/c Ratio	0.23	0.14		0.11	0.16		0.55	0.67	0.03	0.79	0.65	0.07
Uniform Delay, d1	23.9	27.4		29.0	30.2		33.4	16.9	12.3	30.5	13.5	9.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.3		0.3	0.5		7.1	2.6	0.0	18.1	1.9	0.0
Delay (s)	24.4	27.6		29.3	30.7		40.4	19.5	12.3	48.6	15.4	9.5
Level of Service	C	C		C	C		D	B	B	D	B	A
Approach Delay (s)		26.2			30.5			21.0			21.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	73.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	76	94	24	148	74	619	63	227	722	125
v/c Ratio	0.38	0.34	0.12	0.62	0.58	0.85	0.09	0.85	0.79	0.15
Control Delay	39.6	26.8	34.1	24.0	65.5	38.3	0.3	70.0	27.3	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.6	26.8	34.1	24.0	65.5	38.3	0.3	70.0	27.3	4.1
Queue Length 50th (ft)	42	26	13	16	48	362	0	150	391	6
Queue Length 95th (ft)	78	74	33	68	#106	#619	0	#299	#686	35
Internal Link Dist (ft)		2712		3414		1392			1432	
Turn Bay Length (ft)	250		150		175		175	180		175
Base Capacity (vph)	219	480	255	516	141	729	696	268	916	821
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.20	0.09	0.29	0.52	0.85	0.09	0.85	0.79	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	35	45	20	20	105	65	545	55	200	635	110
Future Volume (vph)	65	35	45	20	20	105	65	545	55	200	635	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	1689		1752	1613		1444	1520	1292	1444	1520	1292
Flt Permitted	0.29	1.00		0.70	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	532	1689		1284	1613		1444	1520	1292	1444	1520	1292
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	76	41	53	24	24	124	74	619	62	227	722	125
RTOR Reduction (vph)	0	41	0	0	112	0	0	0	33	0	0	44
Lane Group Flow (vph)	76	53	0	24	36	0	74	619	30	227	722	81
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	25%	25%	25%	25%	25%	25%
Turn Type	pm+pt	NA		pm+pt	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)	21.9	14.5		12.9	10.0		7.6	50.5	50.5	19.1	62.0	62.0
Effective Green, g (s)	21.9	14.5		12.9	10.0		7.6	50.5	50.5	19.1	62.0	62.0
Actuated g/C Ratio	0.20	0.14		0.12	0.09		0.07	0.47	0.47	0.18	0.58	0.58
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	193	228		167	150		102	717	609	257	880	748
v/s Ratio Prot	c0.03	0.03		0.00	0.02		0.05	c0.41		c0.16	0.47	
v/s Ratio Perm	c0.05			0.01					0.02			0.06
v/c Ratio	0.39	0.23		0.14	0.24		0.73	0.86	0.05	0.88	0.82	0.11
Uniform Delay, d1	35.7	41.3		42.0	45.0		48.7	25.2	15.3	42.9	18.0	10.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	0.5		0.4	0.8		22.4	10.5	0.0	27.9	6.2	0.1
Delay (s)	37.0	41.8		42.3	45.8		71.1	35.7	15.3	70.8	24.2	10.2
Level of Service	D	D		D	D		E	D	B	E	C	B
Approach Delay (s)		39.7			45.3			37.5			32.4	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	35.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	107.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Alternate 2A - Fox Ln. & SH 4

Grady County, Oklahoma

TEC
A CLEAR DIRECTION

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	188	242	477	455
Demand Flow Rate, veh/h	193	250	596	569
Vehicles Circulating, veh/h	603	651	259	88
Vehicles Exiting, veh/h	54	204	537	813
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.0	9.8	12.4	8.7
Approach LOS	A	A	B	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	193	250	596	569
Cap Entry Lane, veh/h	746	710	1060	1261
Entry HV Adj Factor	0.972	0.970	0.800	0.800
Flow Entry, veh/h	188	242	477	455
Cap Entry, veh/h	725	689	848	1009
V/C Ratio	0.259	0.352	0.563	0.451
Control Delay, s/veh	8.0	9.8	12.4	8.7
LOS	A	A	B	A
95th %tile Queue, veh	1	2	4	2

Intersection	
Intersection Delay, s/veh	23.8
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	271	353	681	660
Demand Flow Rate, veh/h	279	364	851	825
Vehicles Circulating, veh/h	874	934	370	124
Vehicles Exiting, veh/h	75	287	783	1174
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	15.2	24.1	36.0	14.5
Approach LOS	C	C	E	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	279	364	851	825
Cap Entry Lane, veh/h	566	532	946	1216
Entry HV Adj Factor	0.972	0.971	0.800	0.800
Flow Entry, veh/h	271	353	681	660
Cap Entry, veh/h	550	517	757	972
V/C Ratio	0.493	0.684	0.899	0.678
Control Delay, s/veh	15.2	24.1	36.0	14.5
LOS	C	C	E	B
95th %tile Queue, veh	3	5	12	6

Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

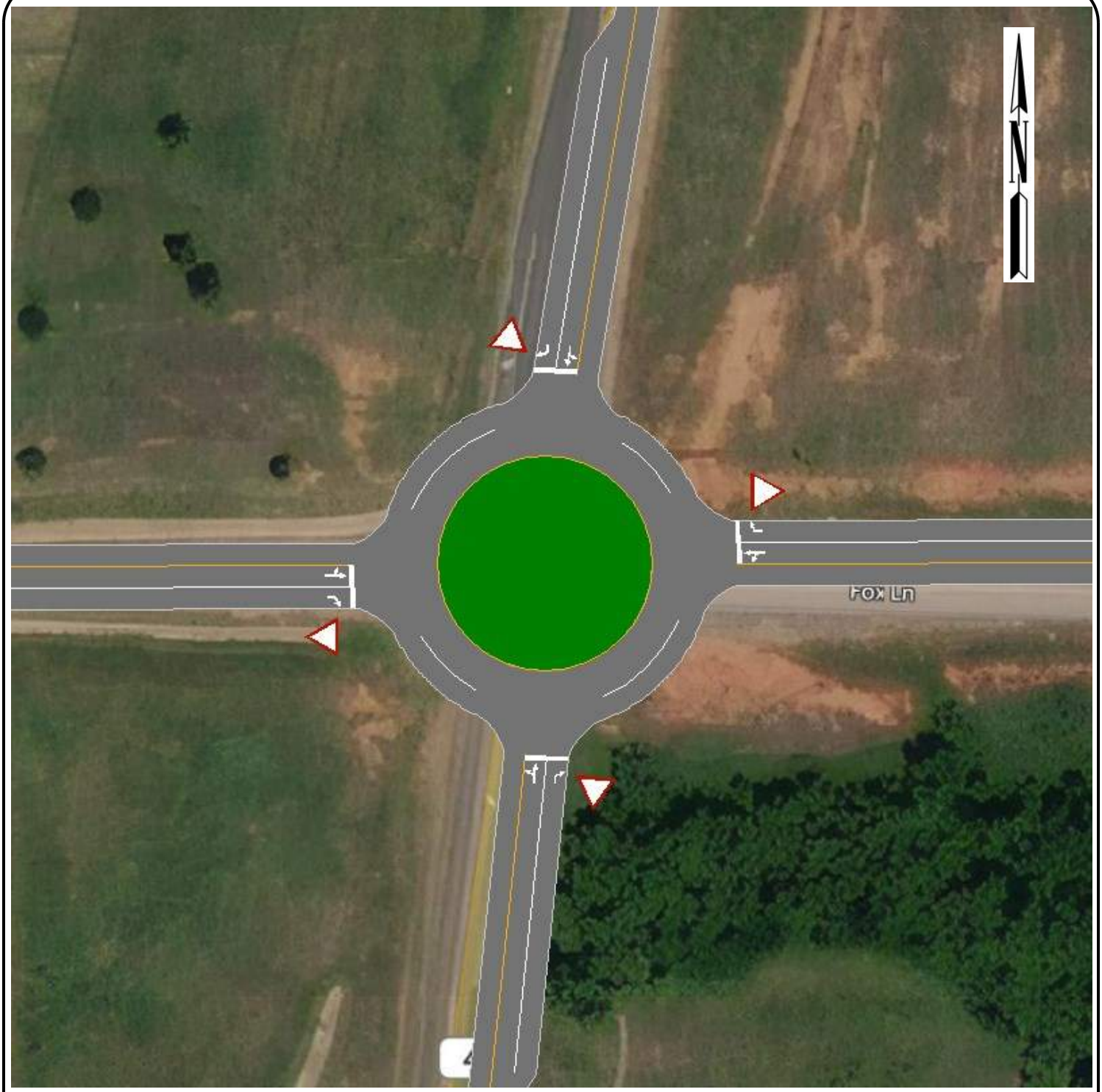
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	117	118	523	738
Demand Flow Rate, veh/h	121	122	654	923
Vehicles Circulating, veh/h	835	659	284	102
Vehicles Exiting, veh/h	189	279	672	679
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.0	7.2	14.7	17.0
Approach LOS	A	A	B	C

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	121	122	654	923
Cap Entry Lane, veh/h	589	705	1033	1244
Entry HV Adj Factor	0.968	0.971	0.800	0.800
Flow Entry, veh/h	117	118	523	738
Cap Entry, veh/h	570	684	826	995
V/C Ratio	0.205	0.173	0.633	0.742
Control Delay, s/veh	9.0	7.2	14.7	17.0
LOS	A	A	B	C
95th %tile Queue, veh	1	1	5	7

Intersection	
Intersection Delay, s/veh	68.0
Intersection LOS	F

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	170	172	755	1068
Demand Flow Rate, veh/h	175	178	944	1335
Vehicles Circulating, veh/h	1204	944	404	142
Vehicles Exiting, veh/h	273	403	975	980
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	18.2	12.3	65.8	86.4
Approach LOS	C	B	F	F

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	175	178	944	1335
Cap Entry Lane, veh/h	404	527	914	1194
Entry HV Adj Factor	0.970	0.968	0.800	0.800
Flow Entry, veh/h	170	172	755	1068
Cap Entry, veh/h	392	510	731	955
V/C Ratio	0.433	0.338	1.033	1.118
Control Delay, s/veh	18.2	12.3	65.8	86.4
LOS	C	B	F	F
95th %tile Queue, veh	2	1	18	28



Alternate 2B - Fox Ln. & SH 4

Grady County, Oklahoma

TEC
A CLEAR DIRECTION

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	188	242	477	455
Demand Flow Rate, veh/h	193	250	596	569
Vehicles Circulating, veh/h	603	651	259	88
Vehicles Exiting, veh/h	33	162	489	637
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.6	7.5	10.9	8.3
Approach LOS	A	A	B	A

Lane	Left	Bypass	Left	Bypass	Left	Bypass	Left	Bypass
Designated Moves	LT	R	LT	R	LT	R	LT	R
Assumed Moves	LT	R	LT	R	LT	R	LT	R
RT Channelized		Yield		Yield		Yield		Yield
Lane Util	1.000		1.000		1.000		1.000	
Follow-Up Headway, s	2.609		2.609		2.609		2.609	
Critical Headway, s	4.976	48	4.976	176	4.976	42	4.976	21
Entry Flow, veh/h	145	838	74	721	554	1170	548	1334
Cap Entry Lane, veh/h	746	0.971	710	0.971	1060	0.800	1261	0.800
Entry HV Adj Factor	0.970	47	0.965	171	0.800	34	0.800	17
Flow Entry, veh/h	141	814	71	700	443	936	438	1067
Cap Entry, veh/h	723	0.058	686	0.244	847	0.036	1009	0.016
V/C Ratio	0.194	5.0	0.104	8.0	0.523	4.2	0.434	3.5
Control Delay, s/veh	7.1	A	6.4	A	11.4	A	8.5	A
LOS	A	0	A	1	B	0	A	0
95th %tile Queue, veh	1		0		3		2	

Intersection	
Intersection Delay, s/veh	17.8
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	271	353	681	660
Demand Flow Rate, veh/h	279	364	851	825
Vehicles Circulating, veh/h	874	934	370	124
Vehicles Exiting, veh/h	46	231	710	913
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	10.7	13.7	27.0	13.3
Approach LOS	B	B	D	B

Lane	Left	Bypass	Left	Bypass	Left	Bypass	Left	Bypass
Designated Moves	LT	R	LT	R	LT	R	LT	R
Assumed Moves	LT	R	LT	R	LT	R	LT	R
RT Channelized		Yield		Yield		Yield		Yield
Lane Util	1.000		1.000		1.000		1.000	
Follow-Up Headway, s	2.609		2.609		2.609		2.609	
Critical Headway, s	4.976	73	4.976	261	4.976	56	4.976	29
Entry Flow, veh/h	206	669	103	544	795	1090	796	1317
Cap Entry Lane, veh/h	566	0.971	532	0.971	946	0.800	1216	0.800
Entry HV Adj Factor	0.971	71	0.974	253	0.800	45	0.800	23
Flow Entry, veh/h	200	649	100	528	636	872	637	1053
Cap Entry, veh/h	550	0.109	518	0.479	757	0.052	972	0.022
V/C Ratio	0.364	6.8	0.194	15.3	0.840	4.6	0.655	3.6
Control Delay, s/veh	12.1	A	9.6	C	28.6	A	13.7	A
LOS	B	0	A	3	D	0	B	0
95th %tile Queue, veh	2		1		10		5	

Intersection	
Intersection Delay, s/veh	11.6
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	117	118	523	738
Demand Flow Rate, veh/h	121	122	654	923
Vehicles Circulating, veh/h	835	659	284	102
Vehicles Exiting, veh/h	83	229	636	595
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.4	6.0	12.6	12.5
Approach LOS	A	A	B	B

Lane	Left	Bypass	Left	Bypass	Left	Bypass	Left	Bypass
Designated Moves	LT	R	LT	R	LT	R	LT	R
Assumed Moves	LT	R	LT	R	LT	R	LT	R
RT Channelized		Yield		Yield		Yield		Yield
Lane Util	1.000		1.000		1.000		1.000	
Follow-Up Headway, s	2.609		2.609		2.609		2.609	
Critical Headway, s	4.976	36	4.976	84	4.976	50	4.976	106
Entry Flow, veh/h	85	721	38	752	604	1092	817	1268
Cap Entry Lane, veh/h	589	0.971	705	0.971	1033	0.800	1244	0.800
Entry HV Adj Factor	0.966	35	0.959	82	0.800	40	0.800	85
Flow Entry, veh/h	82	700	36	730	483	874	653	1014
Cap Entry, veh/h	569	0.050	676	0.112	826	0.046	995	0.084
V/C Ratio	0.144	5.7	0.054	6.1	0.585	4.5	0.657	4.3
Control Delay, s/veh	8.1	A	5.9	A	13.2	A	13.6	A
LOS	A	0	A	0	B	0	B	0
95th %tile Queue, veh	1		0		4		5	

Intersection	
Intersection Delay, s/veh	21.6
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	170	172	755	1068
Demand Flow Rate, veh/h	175	178	944	1335
Vehicles Circulating, veh/h	1076	944	276	142
Vehicles Exiting, veh/h	117	198	920	852
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	10.9	9.0	24.1	23.6
Approach LOS	B	A	C	C

Lane	Left	Bypass	Left	Bypass	Left	Bypass	Left	Bypass
Designated Moves	LT	R	LT	R	LT	R	LT	R
Assumed Moves	LT	R	LT	R	LT	R	LT	R
RT Channelized		Yield		Yield		Yield		Yield
Lane Util	1.000		1.000		1.000		1.000	
Follow-Up Headway, s	2.609		2.609		2.609		2.609	
Critical Headway, s	4.976	55	4.976	128	4.976	77	4.976	284
Entry Flow, veh/h	120	540	50	579	866	1128	1051	1225
Cap Entry Lane, veh/h	461	0.971	527	0.971	1041	0.800	1194	0.800
Entry HV Adj Factor	0.973	53	0.965	124	0.800	62	0.800	227
Flow Entry, veh/h	117	524	48	562	693	902	841	980
Cap Entry, veh/h	448	0.101	509	0.221	834	0.069	955	0.232
V/C Ratio	0.261	8.1	0.095	9.3	0.832	4.6	0.880	5.9
Control Delay, s/veh	12.1	A	8.3	A	25.8	A	28.3	A
LOS	B	0	A	1	D	0	D	1
95th %tile Queue, veh	1		0		10		12	

Alternate 3A - Fox Ln. & SH 4

Grady County, Oklahoma

TEC
A CLEAR DIRECTION

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	170	60	65	35	0	0	0	0	115	0	20
Future Vol, veh/h	0	170	60	65	35	0	0	0	0	115	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	185	65	71	38	0	0	0	0	125	0	22

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	250	0	0	398	430	38
Stage 1	-	-	-	-	-	-	180	180	-
Stage 2	-	-	-	-	-	-	218	250	-
Critical Hdwy	-	-	-	4.12	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1316	-	0	607	518	1034
Stage 1	0	-	-	-	-	0	851	750	-
Stage 2	0	-	-	-	-	0	818	700	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1316	-	-	574	0	1034
Mov Cap-2 Maneuver	-	-	-	-	-	-	574	0	-
Stage 1	-	-	-	-	-	-	851	0	-
Stage 2	-	-	-	-	-	-	774	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	5.1	12.7
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1316	-	615
HCM Lane V/C Ratio	-	-	0.054	-	0.239
HCM Control Delay (s)	-	-	7.9	-	12.7
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0.2	-	0.9

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	115	170	0	0	85	215	15	0	40	0	0	0
Future Vol, veh/h	115	170	0	0	85	215	15	0	40	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	135	200	0	0	100	253	17	0	45	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	353	0	-	-	-	0	697	823	200
Stage 1	-	-	-	-	-	-	470	470	-
Stage 2	-	-	-	-	-	-	227	353	-
Critical Hdwy	4.13	-	-	-	-	-	6.65	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	5.65	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.65	5.75	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.725	4.225	3.525
Pot Cap-1 Maneuver	1200	-	0	0	-	-	374	284	786
Stage 1	-	-	0	0	-	-	584	523	-
Stage 2	-	-	0	0	-	-	759	592	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1200	-	-	-	-	-	332	0	786
Mov Cap-2 Maneuver	-	-	-	-	-	-	332	0	-
Stage 1	-	-	-	-	-	-	519	0	-
Stage 2	-	-	-	-	-	-	759	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.4	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	572	1200	-	-	-
HCM Lane V/C Ratio	0.109	0.113	-	-	-
HCM Control Delay (s)	12.1	8.4	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0.4	-	-	-

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	100	40	20	85	0	0	0	0	200	0	110
Future Vol, veh/h	0	100	40	20	85	0	0	0	0	200	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	109	43	22	92	0	0	0	0	217	0	120

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	152	0	0	267	288	92
Stage 1	-	-	-	-	-	-	136	136	-
Stage 2	-	-	-	-	-	-	131	152	-
Critical Hdwy	-	-	-	4.12	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1429	-	0	722	622	965
Stage 1	0	-	-	-	-	0	890	784	-
Stage 2	0	-	-	-	-	0	895	772	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1429	-	-	711	0	965
Mov Cap-2 Maneuver	-	-	-	-	-	-	711	0	-
Stage 1	-	-	-	-	-	-	890	0	-
Stage 2	-	-	-	-	-	-	882	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	1.4	13
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1429	-	784
HCM Lane V/C Ratio	-	-	0.015	-	0.43
HCM Control Delay (s)	-	-	7.6	-	13
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0	-	2.2

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	235	0	0	40	105	65	0	55	0	0	0
Future Vol, veh/h	65	235	0	0	40	105	65	0	55	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	76	276	0	0	47	124	74	0	63	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	171	0	-	-	-	0	537	599	276
Stage 1	-	-	-	-	-	-	428	428	-
Stage 2	-	-	-	-	-	-	109	171	-
Critical Hdwy	4.13	-	-	-	-	-	6.65	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	5.65	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.65	5.75	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.725	4.225	3.525
Pot Cap-1 Maneuver	1400	-	0	0	-	-	467	386	711
Stage 1	-	-	0	0	-	-	611	547	-
Stage 2	-	-	0	0	-	-	861	716	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1400	-	-	-	-	-	442	0	711
Mov Cap-2 Maneuver	-	-	-	-	-	-	442	0	-
Stage 1	-	-	-	-	-	-	578	0	-
Stage 2	-	-	-	-	-	-	861	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.7	0	14
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	535	1400	-	-	-
HCM Lane V/C Ratio	0.255	0.055	-	-	-
HCM Control Delay (s)	14	7.7	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	1	0.2	-	-	-

Alternate 3B - Fox Ln. & SH 4

Grady County, Oklahoma

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	170	60	65	35	0	0	0	0	115	0	20
Future Vol, veh/h	0	170	60	65	35	0	0	0	0	115	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	185	65	71	38	0	0	0	0	125	0	22

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	250	0	0	398	430	38
Stage 1	-	-	-	-	-	-	180	180	-
Stage 2	-	-	-	-	-	-	218	250	-
Critical Hdwy	-	-	-	4.12	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1316	-	0	607	518	1034
Stage 1	0	-	-	-	-	0	851	750	-
Stage 2	0	-	-	-	-	0	818	700	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1316	-	-	574	0	1034
Mov Cap-2 Maneuver	-	-	-	-	-	-	574	0	-
Stage 1	-	-	-	-	-	-	851	0	-
Stage 2	-	-	-	-	-	-	774	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	5.1	12.7
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1316	-	615
HCM Lane V/C Ratio	-	-	0.054	-	0.239
HCM Control Delay (s)	-	-	7.9	-	12.7
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0.2	-	0.9

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	115	170	0	0	85	215	15	0	40	0	0	0
Future Vol, veh/h	115	170	0	0	85	215	15	0	40	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	135	200	0	0	100	253	17	0	45	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	353	0	-	-	-	0	697	823	200
Stage 1	-	-	-	-	-	-	470	470	-
Stage 2	-	-	-	-	-	-	227	353	-
Critical Hdwy	4.13	-	-	-	-	-	6.65	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	5.65	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.65	5.75	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.725	4.225	3.525
Pot Cap-1 Maneuver	1200	-	0	0	-	-	374	284	786
Stage 1	-	-	0	0	-	-	584	523	-
Stage 2	-	-	0	0	-	-	759	592	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1200	-	-	-	-	-	332	0	786
Mov Cap-2 Maneuver	-	-	-	-	-	-	332	0	-
Stage 1	-	-	-	-	-	-	519	0	-
Stage 2	-	-	-	-	-	-	759	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.4	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	572	1200	-	-	-
HCM Lane V/C Ratio	0.109	0.113	-	-	-
HCM Control Delay (s)	12.1	8.4	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0.4	-	-	-

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	100	45	20	85	0	0	0	0	200	0	110
Future Vol, veh/h	0	100	45	20	85	0	0	0	0	200	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	109	49	22	92	0	0	0	0	217	0	120

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	158	0	0	270	294	92
Stage 1	-	-	-	-	-	-	136	136	-
Stage 2	-	-	-	-	-	-	134	158	-
Critical Hdwy	-	-	-	4.12	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1422	-	0	719	617	965
Stage 1	0	-	-	-	-	0	890	784	-
Stage 2	0	-	-	-	-	0	892	767	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1422	-	-	708	0	965
Mov Cap-2 Maneuver	-	-	-	-	-	-	708	0	-
Stage 1	-	-	-	-	-	-	890	0	-
Stage 2	-	-	-	-	-	-	879	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	1.4	13
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1422	-	782
HCM Lane V/C Ratio	-	-	0.015	-	0.431
HCM Control Delay (s)	-	-	7.6	-	13
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0	-	2.2

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	235	0	0	40	105	65	0	55	0	0	0
Future Vol, veh/h	65	235	0	0	40	105	65	0	55	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	76	276	0	0	47	124	74	0	63	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	171	0	-	-	-	0	537	599	276
Stage 1	-	-	-	-	-	-	428	428	-
Stage 2	-	-	-	-	-	-	109	171	-
Critical Hdwy	4.13	-	-	-	-	-	6.65	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	5.65	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.65	5.75	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.725	4.225	3.525
Pot Cap-1 Maneuver	1400	-	0	0	-	-	467	386	711
Stage 1	-	-	0	0	-	-	611	547	-
Stage 2	-	-	0	0	-	-	861	716	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1400	-	-	-	-	-	442	0	711
Mov Cap-2 Maneuver	-	-	-	-	-	-	442	0	-
Stage 1	-	-	-	-	-	-	578	0	-
Stage 2	-	-	-	-	-	-	861	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.7	0	14
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	535	1400	-	-	-
HCM Lane V/C Ratio	0.255	0.055	-	-	-
HCM Control Delay (s)	14	7.7	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	1	0.2	-	-	-

Alternate 3C/D - Fox Ln. & SH 4

Grady County, Oklahoma

TEC
A CLEAR DIRECTION

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	170	60	65	35	0	0	0	0	115	0	20
Future Vol, veh/h	0	170	60	65	35	0	0	0	0	115	0	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	125	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	185	65	71	38	0	0	0	0	125	0	22

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	250	0	0	398	430	38
Stage 1	-	-	-	-	-	-	180	180	-
Stage 2	-	-	-	-	-	-	218	250	-
Critical Hdwy	-	-	-	4.12	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1316	-	0	607	518	1034
Stage 1	0	-	-	-	-	0	851	750	-
Stage 2	0	-	-	-	-	0	818	700	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1316	-	-	574	0	1034
Mov Cap-2 Maneuver	-	-	-	-	-	-	574	0	-
Stage 1	-	-	-	-	-	-	851	0	-
Stage 2	-	-	-	-	-	-	774	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	5.1	12.7
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1316	-	615
HCM Lane V/C Ratio	-	-	0.054	-	0.239
HCM Control Delay (s)	-	-	7.9	-	12.7
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0.2	-	0.9

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	115	170	0	0	85	215	15	0	40	0	0	0
Future Vol, veh/h	115	170	0	0	85	215	15	0	40	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	135	200	0	0	100	253	17	0	45	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	353	0	-	-	-	0	697	823	200
Stage 1	-	-	-	-	-	-	470	470	-
Stage 2	-	-	-	-	-	-	227	353	-
Critical Hdwy	4.13	-	-	-	-	-	6.65	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	5.65	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.65	5.75	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.725	4.225	3.525
Pot Cap-1 Maneuver	1200	-	0	0	-	-	374	284	786
Stage 1	-	-	0	0	-	-	584	523	-
Stage 2	-	-	0	0	-	-	759	592	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1200	-	-	-	-	-	332	0	786
Mov Cap-2 Maneuver	-	-	-	-	-	-	332	0	-
Stage 1	-	-	-	-	-	-	519	0	-
Stage 2	-	-	-	-	-	-	759	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.4	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	572	1200	-	-	-
HCM Lane V/C Ratio	0.109	0.113	-	-	-
HCM Control Delay (s)	12.1	8.4	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.4	0.4	-	-	-

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	100	45	20	85	0	0	0	0	200	0	110
Future Vol, veh/h	0	100	45	20	85	0	0	0	0	200	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	125	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	109	49	22	92	0	0	0	0	217	0	120

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	158	0	0	270	294	92
Stage 1	-	-	-	-	-	-	136	136	-
Stage 2	-	-	-	-	-	-	134	158	-
Critical Hdwy	-	-	-	4.12	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1422	-	0	719	617	965
Stage 1	0	-	-	-	-	0	890	784	-
Stage 2	0	-	-	-	-	0	892	767	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1422	-	-	708	0	965
Mov Cap-2 Maneuver	-	-	-	-	-	-	708	0	-
Stage 1	-	-	-	-	-	-	890	0	-
Stage 2	-	-	-	-	-	-	879	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	1.4	13
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1422	-	782
HCM Lane V/C Ratio	-	-	0.015	-	0.431
HCM Control Delay (s)	-	-	7.6	-	13
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0	-	2.2

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	235	0	0	40	105	65	0	55	0	0	0
Future Vol, veh/h	65	235	0	0	40	105	65	0	55	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	125	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	25	25	25	25	25	25
Mvmt Flow	76	276	0	0	47	124	74	0	63	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	171	0	-	-	-	0	537	599	276
Stage 1	-	-	-	-	-	-	428	428	-
Stage 2	-	-	-	-	-	-	109	171	-
Critical Hdwy	4.13	-	-	-	-	-	6.65	6.75	6.45
Critical Hdwy Stg 1	-	-	-	-	-	-	5.65	5.75	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.65	5.75	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.725	4.225	3.525
Pot Cap-1 Maneuver	1400	-	0	0	-	-	467	386	711
Stage 1	-	-	0	0	-	-	611	547	-
Stage 2	-	-	0	0	-	-	861	716	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1400	-	-	-	-	-	442	0	711
Mov Cap-2 Maneuver	-	-	-	-	-	-	442	0	-
Stage 1	-	-	-	-	-	-	578	0	-
Stage 2	-	-	-	-	-	-	861	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.7	0	14
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	535	1400	-	-	-
HCM Lane V/C Ratio	0.255	0.055	-	-	-
HCM Control Delay (s)	14	7.7	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	1	0.2	-	-	-

Alternate 3E - Fox Ln. & SH 4

Grady County, Oklahoma

Intersection	
Intersection Delay, s/veh	4.5
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	0	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	250	109	0	147
Demand Flow Rate, veh/h	255	111	0	150
Vehicles Circulating, veh/h	199	0	316	111
Vehicles Exiting, veh/h	61	316	138	0
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.3	3.3	0.0	4.0
Approach LOS	A	A	-	A

Lane	Left	Left	Left
Designated Moves	TR	LT	LTR
Assumed Moves	TR	LT	LTR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	255	111	150
Cap Entry Lane, veh/h	1126	1380	1232
Entry HV Adj Factor	0.982	0.984	0.980
Flow Entry, veh/h	250	109	147
Cap Entry, veh/h	1106	1358	1208
V/C Ratio	0.226	0.080	0.122
Control Delay, s/veh	5.3	3.3	4.0
LOS	A	A	A
95th %tile Queue, veh	1	0	0

Intersection	
Intersection Delay, s/veh	5.5
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	0
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	335	353	62	0
Demand Flow Rate, veh/h	345	364	77	0
Vehicles Circulating, veh/h	0	160	345	124
Vehicles Exiting, veh/h	124	262	0	400
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.8	6.1	5.4	0.0
Approach LOS	A	A	A	-

Lane	Left	Left	Left
Designated Moves	LT	TR	LTR
Assumed Moves	LT	TR	LTR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	345	364	77
Cap Entry Lane, veh/h	1380	1172	971
Entry HV Adj Factor	0.971	0.970	0.805
Flow Entry, veh/h	335	353	62
Cap Entry, veh/h	1340	1137	781
V/C Ratio	0.250	0.311	0.079
Control Delay, s/veh	4.8	6.1	5.4
LOS	A	A	A
95th %tile Queue, veh	1	1	0

Intersection	
Intersection Delay, s/veh	4.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	0	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	158	114	0	337
Demand Flow Rate, veh/h	161	116	0	343
Vehicles Circulating, veh/h	243	0	332	116
Vehicles Exiting, veh/h	216	332	72	0
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.8	3.3	0.0	5.5
Approach LOS	A	A	-	A

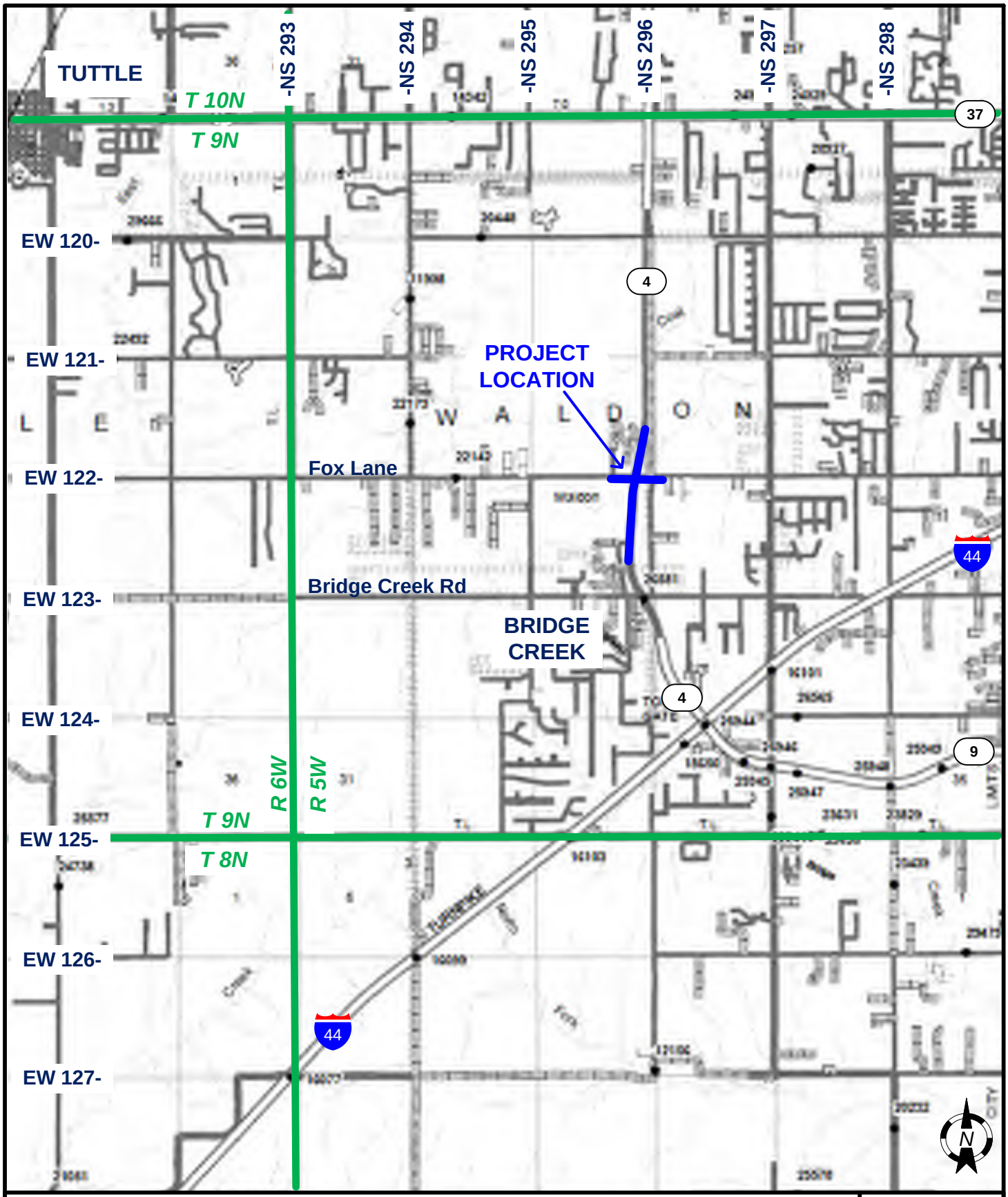
Lane	Left	Left	Left
Designated Moves	TR	LT	LTR
Assumed Moves	TR	LT	LTR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	161	116	343
Cap Entry Lane, veh/h	1077	1380	1226
Entry HV Adj Factor	0.980	0.984	0.983
Flow Entry, veh/h	158	114	337
Cap Entry, veh/h	1056	1358	1204
V/C Ratio	0.149	0.084	0.280
Control Delay, s/veh	4.8	3.3	5.5
LOS	A	A	A
95th %tile Queue, veh	1	0	1

Intersection	
Intersection Delay, s/veh	5.2
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	0
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	352	171	136	0
Demand Flow Rate, veh/h	362	176	170	0
Vehicles Circulating, veh/h	0	170	362	140
Vehicles Exiting, veh/h	140	361	0	206
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.9	4.5	6.6	0.0
Approach LOS	A	A	A	-

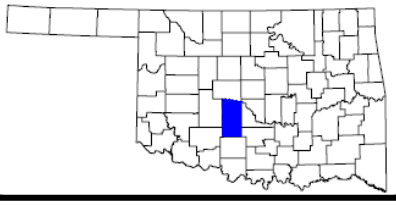
Lane	Left	Left	Left
Designated Moves	LT	TR	LTR
Assumed Moves	LT	TR	LTR
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	362	176	170
Cap Entry Lane, veh/h	1380	1160	954
Entry HV Adj Factor	0.972	0.969	0.800
Flow Entry, veh/h	352	171	136
Cap Entry, veh/h	1341	1125	763
V/C Ratio	0.262	0.152	0.178
Control Delay, s/veh	4.9	4.5	6.6
LOS	A	A	A
95th %tile Queue, veh	1	1	1

APPENDIX C
PRELIMINARY ENVIRONMENTAL ANALYSIS



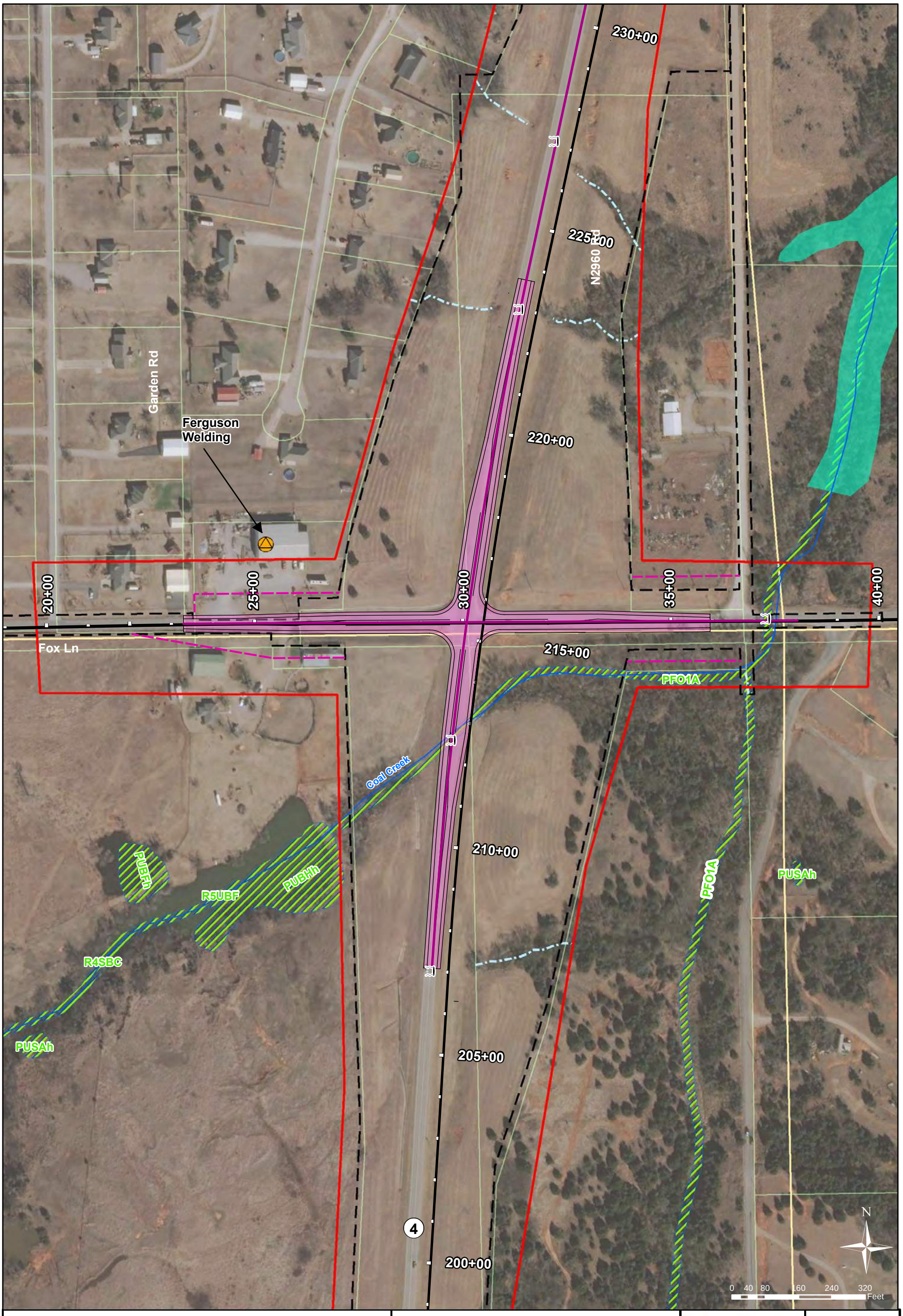
LOCATION MAP

JP 34262(04)
Intersection Modification SH-4: At Fox Lane (EW-122)
2.24 miles north of I-44
Grady Co, OK



OKLAHOMA Transportation

Figure 1



COMMENTS/LEGEND

- Environmental Footprint
- Existing ROW
- Existing Alignment
- Existing Station Ticks
- Proposed ROW
- ALT 1-E Proposed Alignment
- Alternative 1-E Roadway
- Structures
- Business
- City Fire Station
- Commercial Ag
- Parcel Boundary
- Mapped Streams
- Potentially Non-mapped Streams
- NWI Wetlands
- Flood Zone
- Sections

Alternative 1 (A-E) Plans

JP 34262(04) / Project ID: J3-4262(004)
Intersection Modification at
Fox Lane (EW 122)
2.24 mis. N. of I-44
Grady County, OK

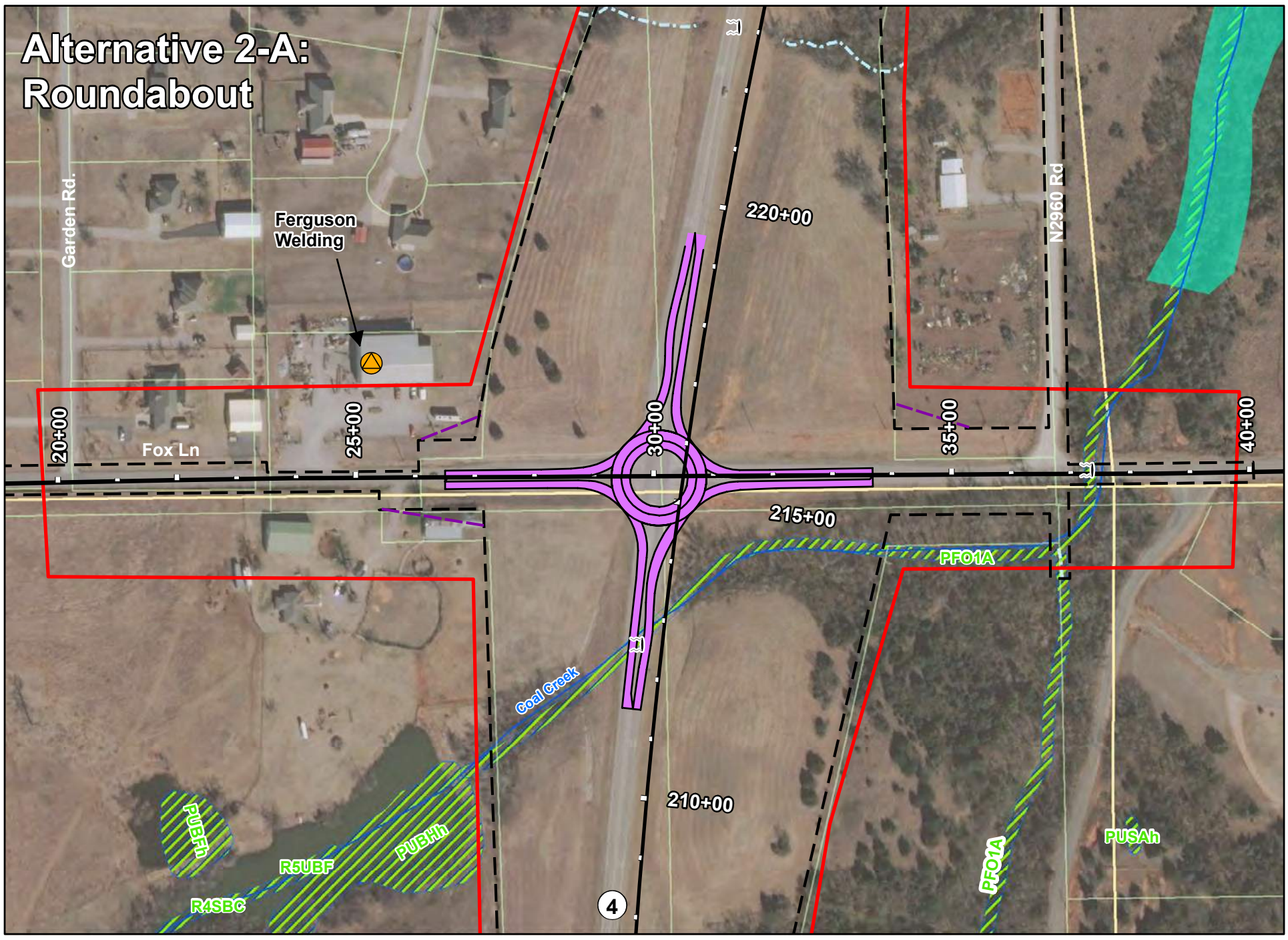
OKLAHOMA Transportation

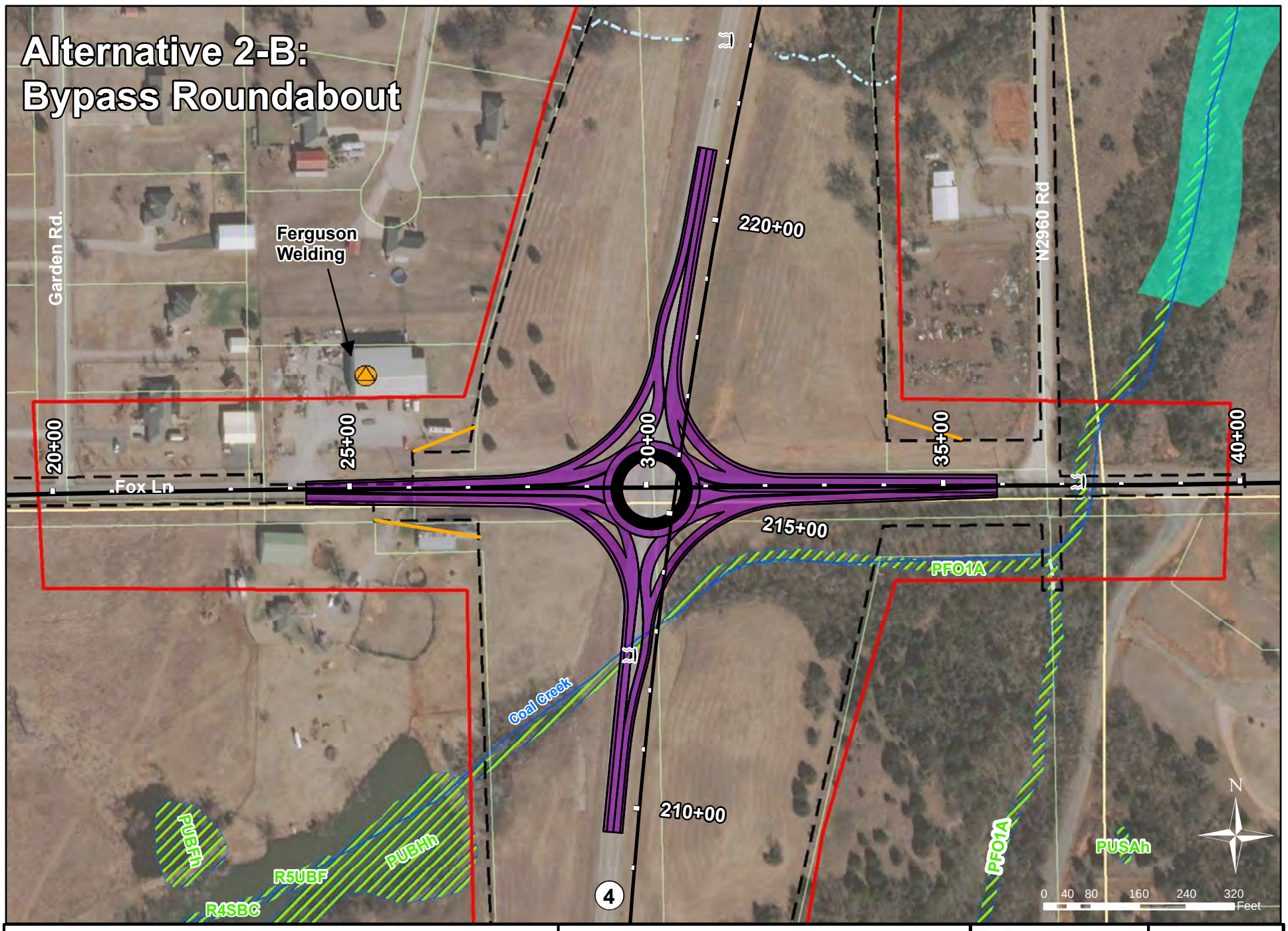
Figure 2

DRAWN BY: LMP
APPRV BY: GAC

SOURCE: DEQ, Tiger 2000, USGS

Date: 9/30/2021





COMMENTS/LEGEND

- Environmental Footprint
- Existing Alignment
- Existing Station Ticks
- Existing ROW
- Alternative 2-A Roadway
- Alternative 2-A or -B Proposed ROW
- Structures
- Business
- Alternative 2-B Roadway
- City Fire Station
- Commercial Ag
- Parcel Boundary
- Mapped Streams
- Potentially Non-mapped Streams
- NWI Wetlands
- Flood Zone
- Sections

Alternative 2 Plans

JP 34262(04) / Project ID: J3-4262(004)
Intersection Modification at
Fox Lane (EW 122)
2.24 mis. N. of I-44
Grady County, OK

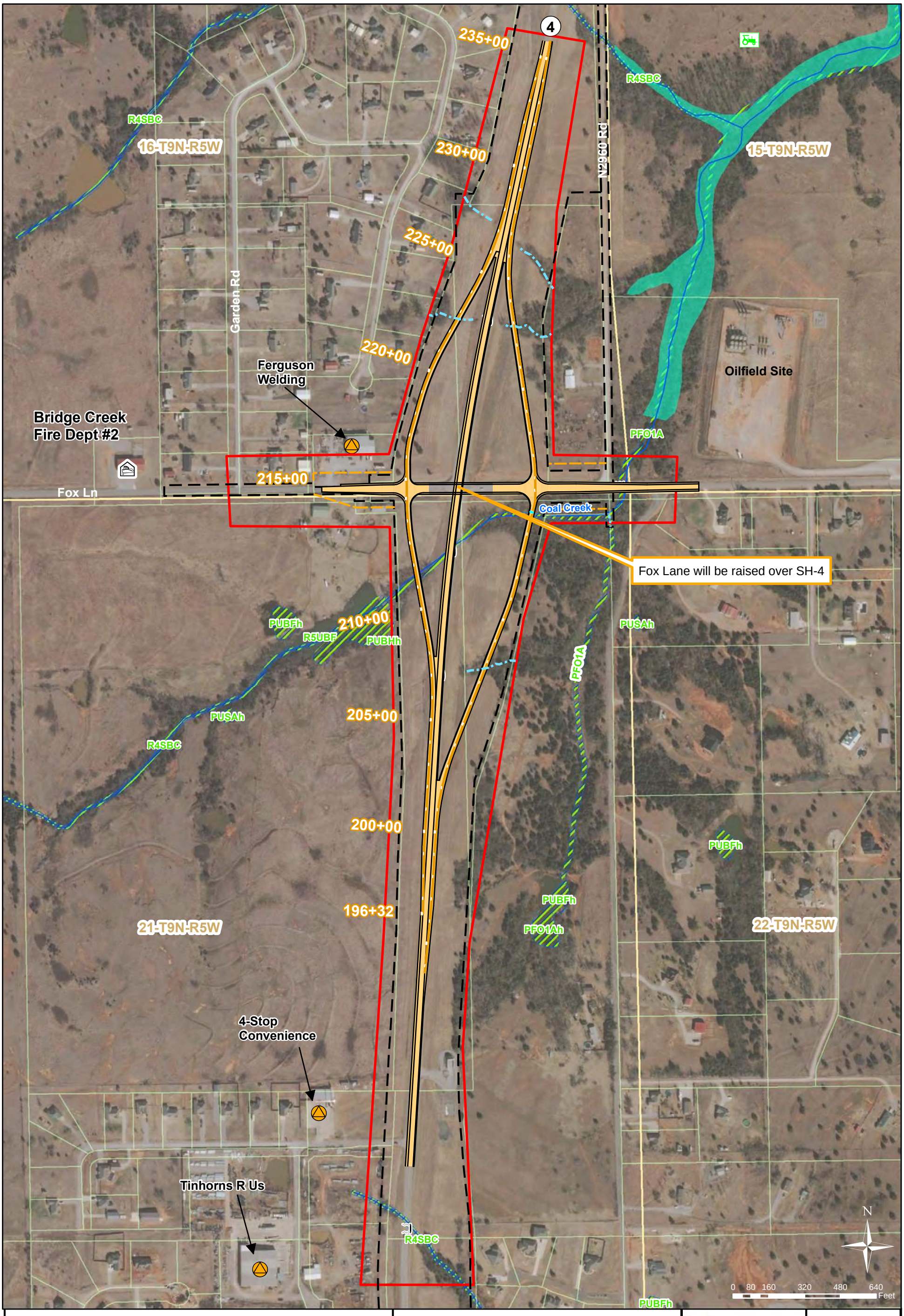
OKLAHOMA Transportation

DRAWN BY: LMP
APPRV BY: GAC

SOURCE: DEQ, Tiger 2000, USGS

Figure 3

Date: 9/30/2021



COMMENTS/LEGEND

- Environmental Footprint
- Existing ROW
- Alternative 3-A and 3-B Alignment
- Alternative 3-A and 3-B Station Ticks
- Alternative 3-A Roadway
- Alternative 3-A, -B, -C, and -D Proposed ROW
- Business
- City Fire Station
- Commercial Ag
- Structures
- Parcel Boundary
- Potential Non-mapped Streams
- Mapped Streams
- Flood Zone
- NWI Wetlands
- Sections

Alternative 3-A Plans

JP 34262(04) / Project ID: J3-4262(004)
Intersection Modification at
Fox Lane (EW 122)
2.24 mis. N. of I-44
Grady County, OK

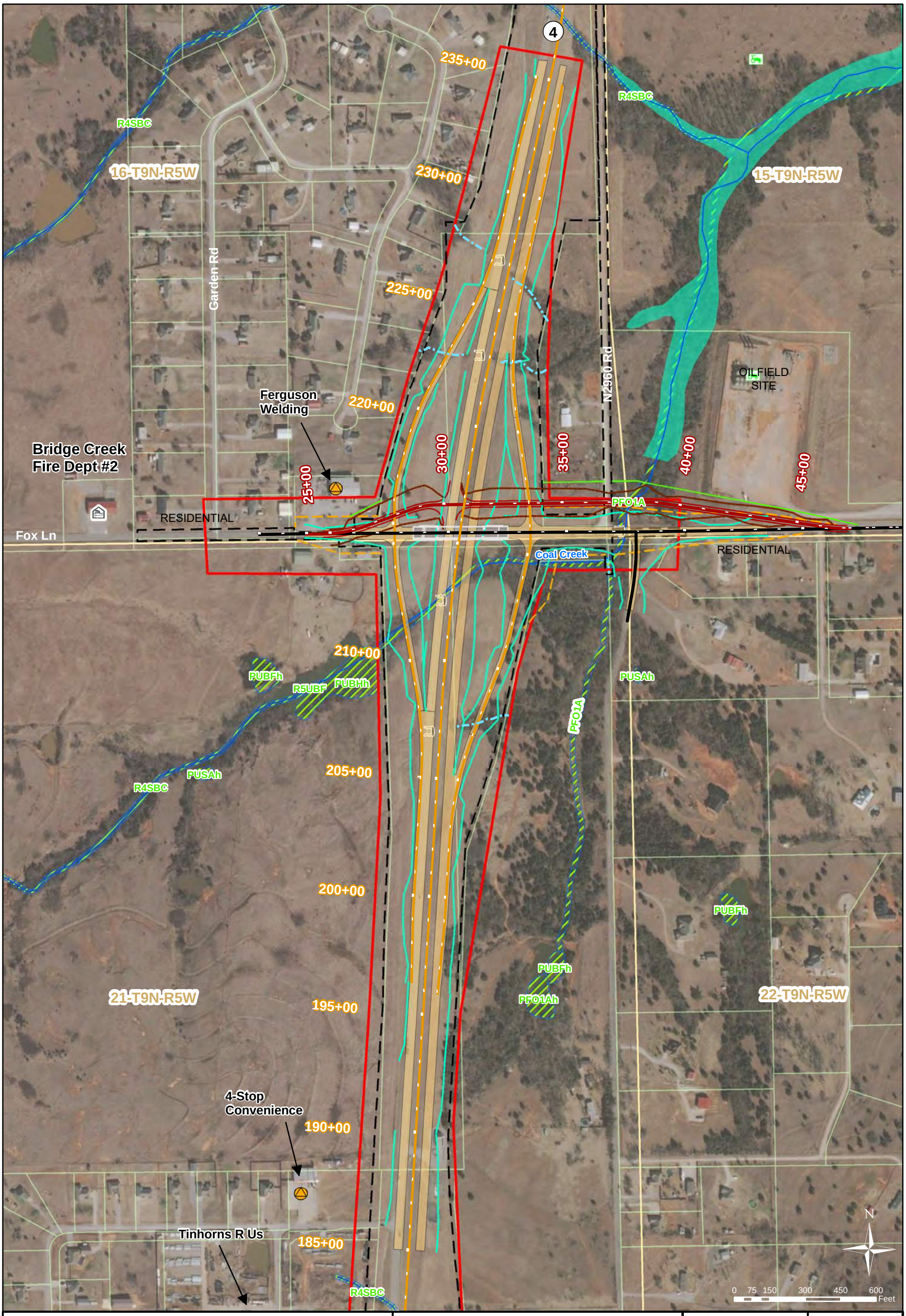
OKLAHOMA Transportation

Figure 4

DRAWN BY: LMP
APPRV BY: GAC

SOURCE: DEQ, Tiger 2000, USGS

Date: 9/30/2021



COMMENTS/LEGEND

- Environmental Footprint
- SH-4 Centerline
- SH-4 Stationing
- Fox Lane Centerline
- Fox Lane Stationing
- Detour Centerline
- Detour Stationing
- Existing ROW
- Alt 3A-2 Proposed ROW
- Alt 3A-2 Temporary ROW
- TOC/TOS
- Proposed Fox Lane Bridge
- Detour Roadway
- Detour TOC/TOS
- Proposed Roadway
- Structures
- Mapped Streams
- Potential Non-mapped Streams
- NWI Wetlands
- Business
- City Fire Station
- Commercial Ag
- Parcel Boundary
- Flood Zone
- Sections

Alternative 3A-2 Plans

JP 34262(04) / Project ID: J3-4262(004)
Intersection Modification at
Fox Lane (EW 122)
2.24 mis. N. of I-44
Grady County, OK

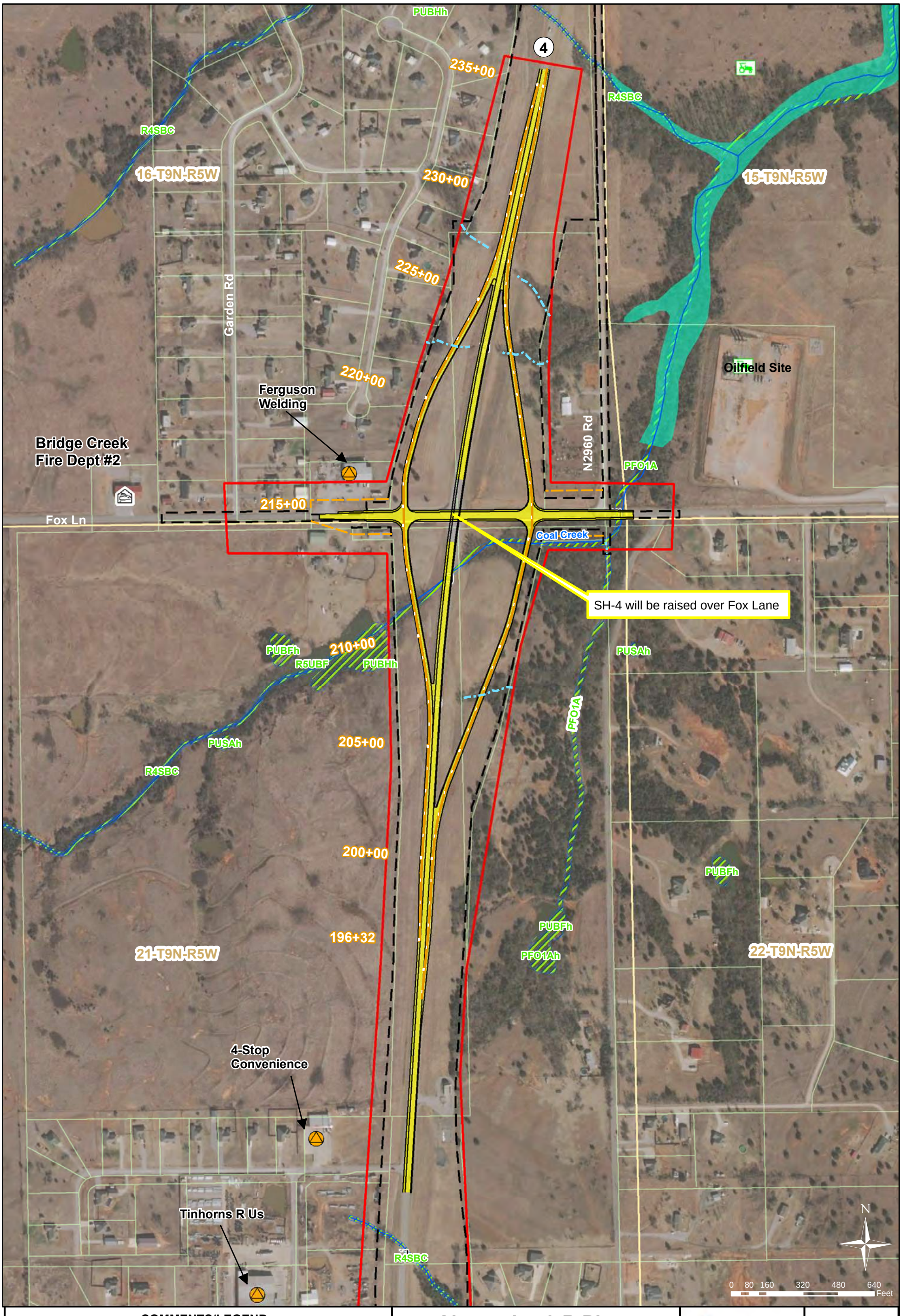
OKLAHOMA Transportation

DRAWN BY: LMP
APPRV BY: GAC

SOURCE: DEQ, Tiger 2000, USGS

Figure 4a

Date: 1/19/2022



COMMENTS/LEGEND

- Environmental Footprint
- Alternative 3-A and 3-B Alignment
- Alternative 3-A and 3-B Alignment
- Existing ROW
- Alternative 3-A, -B, -C, and -D Proposed ROW
- Alternative 3-B Roadway
- Business
- City Fire Station
- Commercial Ag
- Structures
- Parcel Boundary
- Mapped Streams
- Potential Non-mapped Streams
- NWI Wetlands
- Flood Zone
- Sections

Alternative 3-B Plans

JP 34262(04) / Project ID: J3-4262(004)
Intersection Modification at
Fox Lane (EW 122)
2.24 mis. N. of I-44
Grady County, OK

OKLAHOMA Transportation

DRAWN BY: LMP
APPRV BY: GAC

SOURCE: DEQ, Tiger 2000, USGS

Figure 5

Date: 9/30/2021

240+00
PUBHh
235+00
R4SBC
PUBHh
16-T9N-R5W
Garden Rd
230+00
N2960 Rd
15-T9N-R5W
225+00
PFO1A
OILFIELD
SITE
Ferguson
Welding
220+00
Bridge Creek
Fire Dept #2
RESIDENTIAL
Fox Ln
Coal Creek
RESIDENTIAL
210+00
PUBFh
PUBHh
R5UBF
PUSAh
PFO1A
205+00
PUSAh
R4SBC
200+00
PUBFh
PUBFh
PFO1Ah
21-T9N-R5W
195+00
22-T9N-R5W
4-Stop
Convenience
190+00
185+00
Tinhorns R Us
R4SBC
PUBFh
4
N
0 90 180 360 540 720
Feet

COMMENTS/LEGEND

- Environmental Footprint
- SH-4 Alignment
- SH-4 Stationing
- Fox Lane Centerline
- Fox Lane Stationing
- Existing ROW
- Alt 3B-2 Proposed ROW
- Detour Roadway
- TOC/TOS
- Proposed Roadway
- Proposed Bridges
- Structures
- Mapped Streams
- Potential Non-mapped Streams
- NWI Wetlands
- Business
- City Fire Station
- Commercial Ag
- Parcel Boundary
- Flood Zone
- Sections

Alternative 3B-2 Plans

JP 34262(04) / Project ID: J3-4262(004)
Intersection Modification at
Fox Lane (EW 122)
2.24 mis. N. of I-44
Grady County, OK

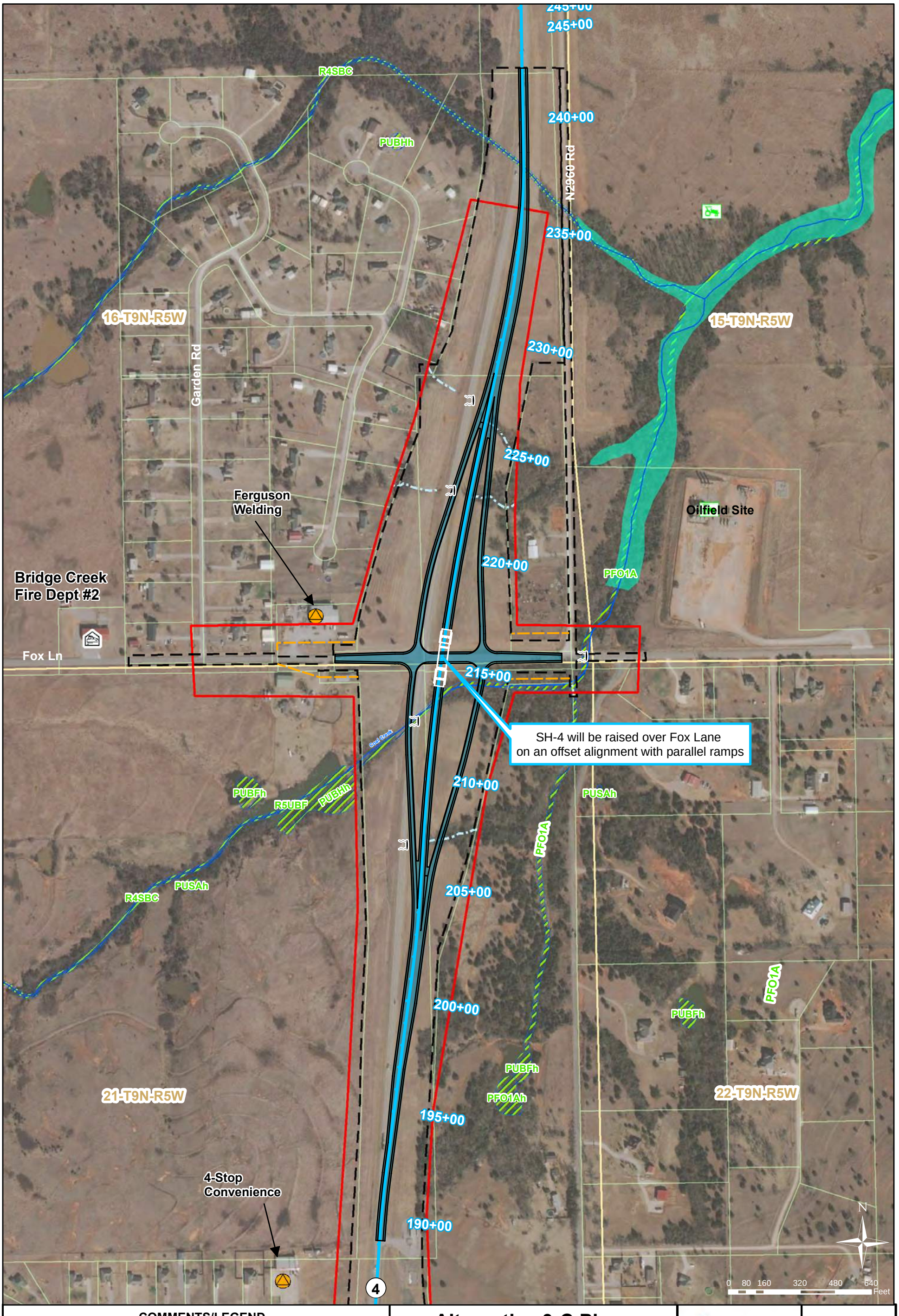
OKLAHOMA Transportation

Figure 5a

DRAWN BY: LMP
APPRV BY: GAC

SOURCE: DEQ, Tiger 2000, USGS

Date: 1/19/2022



COMMENTS/LEGEND

- Environmental Footprint
- Existing ROW
- Alternative 3-A, -B, -C, and -D Proposed ROW
- Alternative 3-C Alignment
- ALT 3-C Roadway
- Business
- City Fire Station
- Commercial Ag
- Structures
- Parcel Boundary
- Mapped Streams
- Potentially Non-mapped Streams
- NWI Wetlands
- Flood Zone
- Sections

Alternative 3-C Plans

JP 34262(04) / Project ID: J3-4262(004)
Intersection Modification at
Fox Lane (EW 122)
2.24 mis. N. of I-44
Grady County, OK

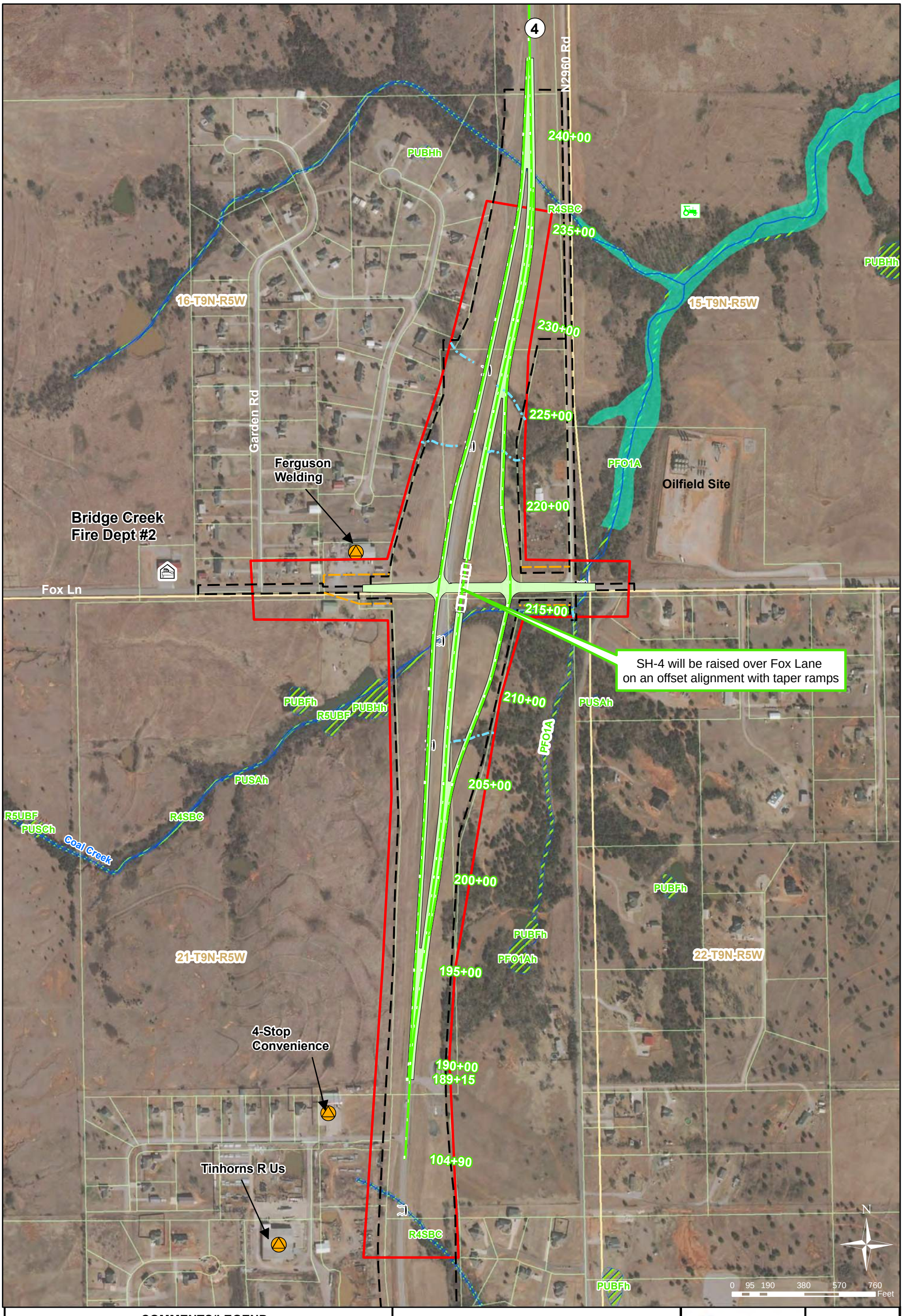
OKLAHOMA Transportation

DRAWN BY: LMP
APPRV BY: GAC

SOURCE: DEQ, Tiger 2000, USGS

Figure 6

Date: 9/30/2021



COMMENTS/LEGEND

- Environmental Footprint
- Existing ROW
- Alternative 3-A, -B, -C, and -D Proposed ROW
- Alternative 3-D Roadway
- Alternative 3-D Alignment
- Alternative 3-D Station Ticks
- Business
- City Fire Station
- Commercial Ag
- Structures
- Parcel Boundary
- Mapped Streams
- Potential Non-mapped Streams
- NWI Wetlands
- Flood Zone
- Sections

Alternative 3-D Plans

JP 34262(04) / Project ID: J3-4262(004)
Intersection Modification at
Fox Lane (EW 122)
2.24 mis. N. of I-44
Grady County, OK

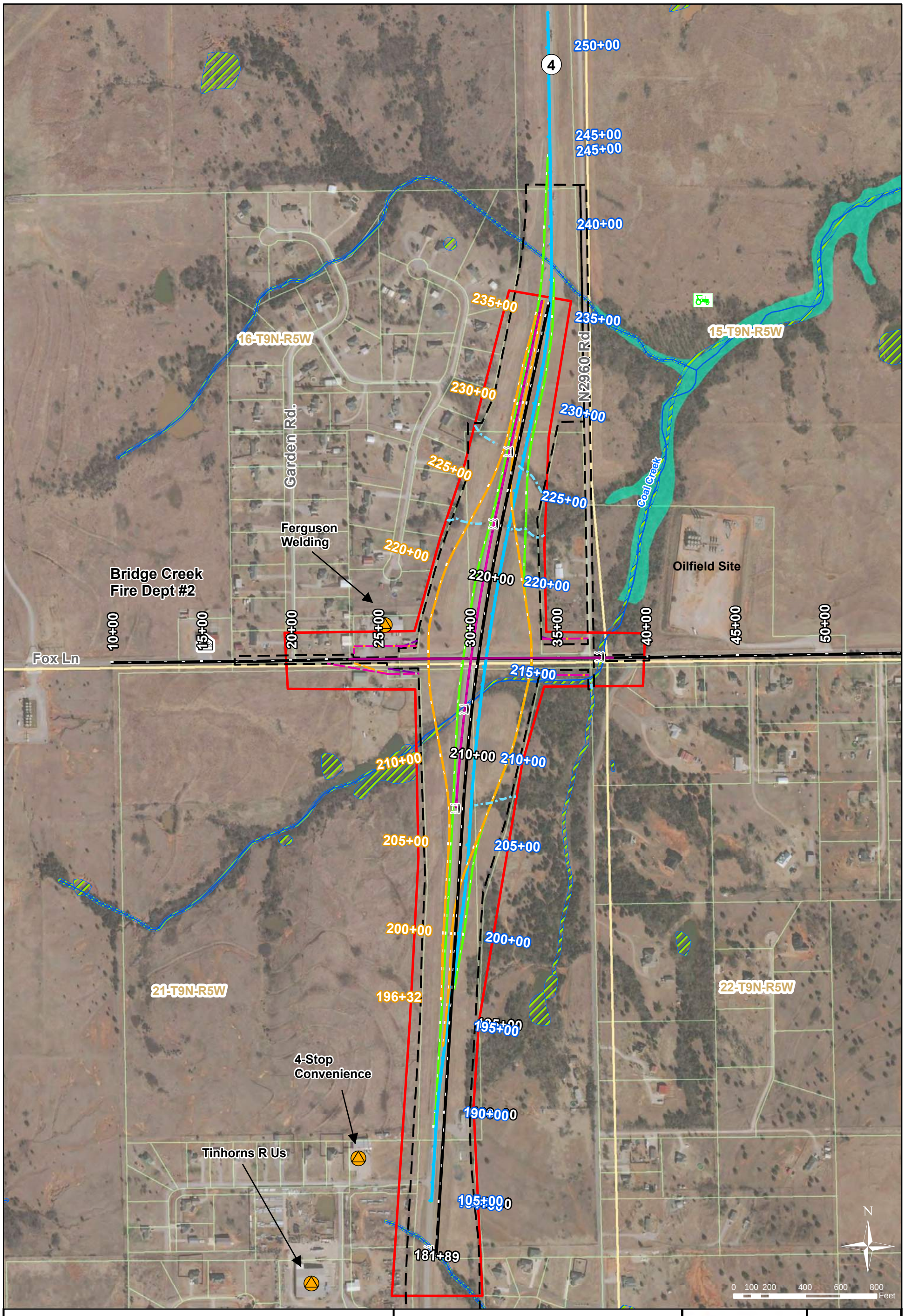
OKLAHOMA Transportation

DRAWN BY: LMP
APPRV BY: GAC

SOURCE: DEQ, Tiger 2000, USGS

Figure 7

Date: 9/30/2021



COMMENTS/LEGEND

- Environmental Footprint
- Existing ROW
- Alternative 1 A-E Proposed ROW
- Alternative 2 -A & -B Proposed ROW
- Alternative 3-A, -B, -C, and -D Proposed ROW
- Existing (Alt 2) Alignment
- Existing (Alt 2) Station Ticks
- Alternative 1 A-E Alignment
- Alternative 3-A & 3-B Alignment
- ALT 3-A. -B. and -C Station Ticks
- Alternative 3-C Alignment
- Alternative 3-D Alignment
- Alternative 3-D Station Ticks
- Parcel Boundary
- Structures
- Mapped Streams
- NWI Wetlands
- Potential Non-mapped Streams
- Flood Zone
- Business
- City Fire Station
- School Property
- Commercial Ag
- Sections

Env. Constraints Map

JP 34262(04) / Project ID: J3-4262(004)
Intersection Modification at
Fox Lane (EW 122)
2.24 mis. N. of I-44
Grady County, OK

OKLAHOMA Transportation

Figure 8

DRAWN BY: LMP
APPRV BY: GAC

SOURCE: DEQ, Tiger 2000, USGS

Date: 9/30/2021

PRELIMINARY ENGINEERING STUDY

ENVIRONMENTAL REVIEW SUMMARY
(Matrix Supporting Information)

CC Environmental performed a reconnaissance-level data collection effort in support of CEC's Preliminary Engineering Study. The following paragraphs explain the information, data, and rationale used to predict the environmental impacts associated with the intersection modification project at Fox Lane.

The proposed project intends to modify and improve the Fox Lane (EW-122)/SH-4 intersection, approximately 2.24 miles northeast of the SH-4/I-44 interchange in Grady County (Figure 1). Three generalized "Alternatives" were proposed with each having several intersection modification sub-options.

- "Alternative 1" – At-grade intersection modification (including Alternative 1-A through 1-F);
- "Alternative 2" – Roundabout intersection (including Alternative 2-A and 2-B);
- "Alternative 3" – Overpass interchanges options including
    - "3A2" – Interchange: Fox Lane over SH-4;
    - "3-B2" – Interchange: SH-4 over Fox Lane on existing alignment;
    - "3-C" – Interchange: SH-4 over Fox Lane on an offset alignment with parallel ramps;
    - "3-D" – Interchange: SH-4 over Fox Lane on an offset alignment with taper ramps.

Alternative 1 includes at-grade intersection options including stop signs, signals and various other configurations. There was a total of five sub-options (i.e., Alternative 1-A, 1-B, 1-C, etc.). For the purpose of this assessment, all five sub-options were combined into one worse-case scenario for environmental impacts.

Alternative 2 proposes to construct a roundabout at the intersection of SH-4 and Fox Lane. Two different sub-options were proposed: Alternative 2-A would be a simple roundabout, while 2-B would be a roundabout with outer bypass lanes.

Alternative 3 proposes an interchange bridge with a raised vertical alignment at the intersection—overpass. This Alternative 3 includes four sub-options. As presented above, each sub-option has a distinct horizontal alignment, and therefore, have varying degrees of impacts when compared to one another.

Reconnaissance-level data was collected, delineated, and compiled into "Impact Categories" (discussed below) for study area that encompassed all three Alternatives. Each Alternative was assessed for individual design, utility, property, and clear zone area requirements, and assigned a "proposed right-of-way" (ROW) footprint. The Alternatives' proposed ROW footprints were then compared with the collected recon data, and the environmental impacts and constraints were specifically quantified. The results are tabulated in the environmental impact matrix summary table—see attached.

The impact matrix was developed to compare the Alternatives efficiently and consistently. Potential impacts/constraints are discussed in more detail in the following sections. The Alternative footprints, alignments, and various environmental constraints are illustrated on Figures 2-8.

IMPACT CATEGORIES:

Community Facilities

Community facilities generically include groups, amenities, and services that support or provide communal and civic wellbeing. Facilities include such things as places of worship, schools, community centers, or municipal services.

There were no community facilities identified within the recon study area; therefore, all Alternatives were considered to have "No Impact".

Cultural Resources

Cultural resources impacts were assessed as part of *ODOT's Cultural Resources Program Project Reconnaissance Reviews* completed May 17, 2021. The reconnaissance area was reviewed with respect to the Oklahoma Archaeological Survey (OAS) state files, tribal databases, National Register of Historic Places (NRHP), and other resources.

According to ODOT-CRP, there were no properties or areas of potential eligibility in the NRHP identified within or near the recon study area. The corridor along Mustang Road (immediately adjacent to the east of SH-4) has been previously surveyed, and no cultural properties were identified. Based off previous surveys and the setting, ODOT-CRP concluded that the likelihood of encountering archaeological sites with intact deposits is minimal, and the likelihood of any sites being eligible for inclusion within the NRHP is also minimal. All Alternatives were consequently assigned a "No Impact" designation in the matrix table.

Economic Resources

Impacts to economic resources include direct and indirect impacts, such as business takings or loss of some other money-generating facility (e.g., oil well), or the reduction in economic capacity (e.g., arable land taken out of production), as well as changes to regional infrastructure, such as highways, railroads, and cell towers.

The review area is primarily surrounded by agricultural land, small businesses, oil and gas activity, and other commercial activities. One business, Ferguson Welding, occurs in the northwest corner of the SH-4/Fox Lane intersection. At the southern end of the environmental footprint, on the west side of SH-4, are two businesses (Tinhorns R US and 4-Stop Convenience store). Access to Ferguson Welding from SH-4 may be temporarily impeded by construction activities, no matter which Alternative is selected. Similarly, construction activities and incidental disturbance during construction of Alternative 3 may impede access; however, no Alternative is expected to result in the take, or permanent impact of Tinhorns R US or 4 Stop Convenience store.

Alternatives 1, 2, and 3 will require the acquisition of new permanent ROW beyond what is currently owned by ODOT. All Alternatives are expected to take some frontage from the Ferguson Welding commercial parcel. No Alternative is expected to require the relocation of any buildings or structures on this property, however.

One barn/structure on the south side of Fox Lane, west of SH-4 will be directly impacted by all Alternatives. From review of the aerial and ground-view mapped imagery, this structure appears to be a dilapidated metal barn. This affected parcel is a privately owned agricultural property. The barn will be a take, but the entire parcel does not appear to be.

Since these Alternatives would permanently affect both the commercial and agricultural properties and result in the take of one structure, all Alternatives were assigned a "Similar Impact" designation in the matrix.

Farmland Impacts
Agricultural land-use appeared to be similar throughout the reconnaissance review area, with crop production being the primary agricultural activity along with some grazing. Crops typical to the ecoregion (Prairie Tableland) are winter wheat, grain sorghum, alfalfa, and soybeans. The topography and soils appear to be relatively consistent and of similar quality across the Alternatives. Consequently, the impact on agriculture would be a direct function of the number of acres taken out of production.

A Farmland Protection Policy Act (FPPA) assessment was not done as part of this study. This impact will be determined during the NEPA review process when the Natural Resource Conservation Service (NRCS) is consulted. New permanent ROW will be acquired for all Alternatives, and each will include some acquisition on the agricultural land on the southwest corner of the SH-4/Fox Lane junction. The anticipated ROW acquisition will likely result in the demolition and possible relocation of a barn (as described above), but is not expected to take acreage out of production. Based on these findings, all Alternatives were assigned a "Low Impact" designation in the impact matrix.

Floodplains
Grady County participates in the Federal Emergency Management Agency's (FEMA) flood insurance program, and a designated FEMA floodplain map is available. Although some designated floodplain associated with Coal Creek is mapped immediately east of the recon study area, it does not fall within the existing SH-4 or Fox Lane ROW. Since no designated floodplains will be directly affected, all Alternatives, were assigned a "No Impact" designation in the matrix table.

Hazardous Waste Impacts
Hazardous waste related impacts were determined by evaluating the regulatory database report, assessing the Oklahoma Corporation Commission's (OCC) oil and gas records, reviewing the Oklahoma Water Resources Board's (OWRB) well databases, and by performing a preliminary desktop-review of the study area.

No USTs, ASTs, leaking underground storage tanks (LUST), monitoring wells, superfund sites, large quantity generators, or other potentially hazardous waste sites were identified within or immediately adjacent to the proposed ROW. None of the Alternatives occurred within an oil or gas field.

One TSD (treatment, storage, or disposal) facility was identified east of SH-4 and north of Fox Lane, which appeared to be the storage location for an oil drilling operation. The proposed temporary ROW for Alternative 3A-2 intersects with this facility and may impact the facility. Based on these findings, Alternatives 1, 2, 3B-2, and 4 were assigned a "Low Impact" designation in the impact matrix, while Alternative 3A-2 was assigned a "Medium Impact" because of the potential impact.

Noise Impacts
ODOT Environmental Programs Division completed a traffic noise screening analysis in September 2021, and used "conceptual plans" dated July 30, 2021 for all Alternatives. Land use in the noise screening area and its immediate surroundings consists mainly of scattered residential dwellings, residential developments, interspersed industrial facilities, maintained ROW and undeveloped land. The traffic noise analysis predicts the greatest noise levels to occur at noise sensitive sites near the proposed action. Fifteen single family homes were analyzed for noise impacts. Based on the future condition analysis (2050 Design Year), no receptors approach, meet, or exceed the respective FHWA Noise Abatement Criteria (66-dB(A) in any of

the provided alternatives. No receptors will experience a substantial increase (15-dB) over the existing sound levels; the highest increase observed was 9.6-dB.

Based on the screening analysis, no FHWA threshold will be exceeded; therefore, no mitigation (e.g., noise wall) should be required for any of the Alternatives. Since there will be a slight increase in noise, all Alternatives were given a "Low Impact" designation in the impact matrix table.

(Note, no model validation measurements were taken and no ambient noise level recordings were collected as part of the preliminary assessment. A detailed noise study that includes model validation and field measurements will be required after the selection of a preferred alternative.)

Right-of-Way Impacts

The existing ODOT ROW within the recon study area covers approximately 70 acres. All assessed Alternatives will require the acquisition of new permanent ROW, particularly along Fox Lane immediately adjacent on either side of SH-4. Alternative 1 and Alternatives 3-B, 3-C, and 3-D are expected to impact a total of four parcels. Two of these four parcels are located west of SH-4, one of which includes a business (Ferguson Welding), and the other is agricultural property. The two parcels located on the east side of the SH-4 intersection appear to be undeveloped/vacant properties.

Alternative 2 will impact one of the vacant properties east of SH-4 and two properties west of SH-4, for a total of three affected parcels.

Alternative 3-A is expected to impact the same four parcels as Alternative 1, along with two additional parcels on the east side of SH-4, one north and one south of Fox Lane, totaling six affected parcels.

Section 4(f) Properties

Section 4(f) of the Department of Transportation (DOT) Act requires that publicly owned land (e.g., public parks, recreational areas, *etc*.) of federal, state, or local importance be considered in any DOT action. DOT cannot approve an action unless there is no *"…feasible and prudent alternative to the use of such land…."*

There were no publicly-owned parks, recreational areas, or wildlife and waterfowl refuges of national, state, or local significance, or land of a historic site of national, state, or local significance identified within or near the reconnaissance footprint area. Therefore, all Alternatives were assigned a "No Impact" designation in the impact matrix.

Socioeconomics Information[1] & Environmental Justice

Grady County's population was 54,795 people in 2019, with a density of 50 people per square mile. The population was approximately 79% white, 5.6% Native American, and 2.4% black, with a median age of 37 years old. The estimated median household income from 2019 was $60,875, which is above the state-wide median household income of $54,449. In 2019, 11.5% of the population was living below the poverty line, which is lower than the state-wide average of 15.2%. (U.S. Census Bureau; American Community Survey 2019 5-year estimates).

Socioeconomic impacts reflect some sort of change ranging in size from local effects in a small community, to larger-scale effects at a county, state or societal level. The proposed improvements should benefit the local area, but the degree is not known.

[1] US Census Bureau, 2019, https://data.census.gov/cedsci/profile?g=0500000US40051

As defined by the Environmental Protection Agency (EPA), environmental justice has to do with the *"fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income…*." Given the relatively small variation in alignment between the six Alternatives, there will not be a disproportionate impact on any group of people. The generalized impacts appear to be limited to the existing transportation corridor and evenly distributed. There were no identified minority or low-income populations within the reconnaissance area that appeared to be targeted or unduly affected. No groups have been identified that would be adversely impacted by the proposed project. Overall, there should not be a meaningful difference between selecting any of the Alternatives—impacts/benefits would be similar. Therefore, all Alternatives were assigned a "No Impact" designation in the impact matrix.

Threatened and Endangered Federally Listed Species

Current federally-listed threatened, endangered, and candidate species for the reconnaissance footprint boundary within Grady County were obtained from the US Fish and Wildlife Service (USFWS)'s Information, Planning, and Conservation (IPaC). There were five species (piping plover, red knot, Arkansas River shiner, whooping crane, and monarch butterfly) potentially located within the study area or in the general vicinity, but there was no designated critical habitat.

Based on a preliminary desktop review, there did not appear to be suitable habitat for the piping plover or red knot. The project does not appear to fall within any federal candidate aquatic species or aquatic-dependent species watersheds, but *is* located within the Canadian River watershed for the federally listed species, Arkansas River shiner. There did appear to be crop field habitat within and around the project area, suitable for stopover habitat for the whooping crane, and the project lies within the 90% confidence interval boundary for the crane's migratory corridor. Much of the project study area includes maintained ROW or lawns, but there was approximately 4.9 acres of unmaintained, perennial vegetation (i.e., shrubby woodlands along riparian corridors) that could be considered potential habitat for the monarch butterfly. (Note, an inquiry to Oklahoma National Heritage Inventory (ONHI), dated September 2021, confirmed there have not been any recorded occurrences of protected species within the vicinity of the project.)

In addition to listed species, there were some birds protected by other regulations identified in the IPaC report. For instance, the red-headed woodpecker was listed as a Bird of Conservation Concern (BCC) for the project. This bird breeds between May 10 to September 10 within the area and may be impacted by the proposed construction and consequential tree clearing. The bald eagle is protected under the Bald and Golden Eagle Protection Act, and although there are no records of eagle occurrences within the recon area, some potential nesting, perching, and foraging habitat is present along the Coal Creek. Also, other species of migratory birds (e.g., swallows and wading birds) are protected by the Migratory Bird Treaty Act. There are bridge and box structures that may provide suitable nesting conditions for swallows and might require netting or seasonal restrictions to avoid impacts from percussive construction activities.

A biological assessment for potential impacts was not performed as part of this study; consequently, additional assessment will be completed once a preferred Alternative is selected. Anticipated impacts would likely be related to the whooping crane and monarch butterfly. Oklahoma does not include nesting grounds for the migratory whooping cranes, but this area of Grady County, with low flat topography, including crop fields intersected by stream and river features suitable for foraging, may provide potential stopover habitat for the species. Any conversion of crop field habitat to new ROW, or deterrence of the species due to loud and disruptive construction equipment, may have an impact on the whooping crane, but is not likely to adversely affect the species. Much of the project area is regularly maintained and lacks areas dominated by native, perennial vegetation suitable for monarch butterfly; however, any conversion of any

of the small areas of native vegetation to new ROW may have a potential impact, but is not likely to adversely affect the species.

All Alternatives had relatively equal impacts to surrounding crop field and native perennial habitat. Due to the potential impacts on the whooping crane and monarch butterfly, all proposed Alternatives were assigned a "Similar/Low Impact" designation in the matrix table, and will most likely result in "may affect, not likely to adversely affect" finding during the NEPA assessment. At this time, it should be assumed that the impacts to endangered species will require consultation with the US Fish & Wildlife Service (USFWS), but will not delay delivery of the project.

Stream Impacts

Stream impacts were based on review of the USGS 7.5-minute quadrangle 1:24,000 scale topographic map and desktop review of aerial imagery. As quantified below, "linear-foot impact" assessment is a worst-case assumption and does not take into account any avoidance or minimization in the design. This review should not be considered a formal assessment, and stream impacts would need to be evaluated further once a preferred alternative is selected. However, Section 404 permitting should not delay the delivery of this project, and a Nationwide 14 permit will most likely apply once design plans are available.

USGS-Mapped Streams

Any stream delineated on a USGS topo map as a "blue-line" would be presumed jurisdictional and subject to US Army Corps of Engineers (USACE) permitting. For the purposes of this report, these features were called "USGS-mapped" streams, and the reported impacts were calculated based on the linear footage of stream intercepted by the Alternatives' proposed ROW. Based on desktop review, three USGS-mapped streams were observed within the environmental study footprint—Coal Creek and two unnamed tributaries to Coal Creek.

- Coal Creek is a tributary to Canadian River and is classified as a temporarily flooded, forested palustrine system classified by broad-leaved deciduous woody species (PFO1A). Approximately 511 linear feet of Coal Creek occurs within the existing ROW, and is likely to be impacted by all Alternatives. (Note: Alternative 3-A2 exhibits the greatest acquisition area of additional permanent and temporary ROW and will have the greatest impact.)
- The first unnamed tributary to Coal Creek occurs at the southern end of the recon footprint and is not expected to be impacted by any of the Alternatives.
- The second unnamed tributary to Coal Creek is north and just outside of the recon study footprint. It is a temporarily flooded, riverine system with and unconsolidated bottom (R4SBC), and flows west to east across the existing ROW for 121 linear feet. It appears that Alternatives 3-C and 3-D will impact this creek as the offset alignments tie back into the existing alignment.

All three Alternatives were assigned a "Medium Impact" for USGS-mapped stream impacts because the linear foot impact exceeds the Nationwide 14 permit length of 300 feet. Alternatives 1, 2, and 3-B2 will affect one stream for 511 linear feet of impact. Alternative 3-A2 will impact more linear feet of the same stream (totaling 775 feet). Alternatives 3-C and 3-D are expected to impact two streams resulting in 632 feet (511 ft + 121 ft) of linear stream impact.

Non-Mapped Streams

Additionally, desktop review of aerial imagery and topographic maps identified six non-mapped and "potentially jurisdictional" features within the recon study footprint. Since these features are not USGS-mapped streams, they received separate designation in the matrix table, identified as "Non-mapped Features".

These features were observed to be draining upland areas (three from the west side of SH-4, east towards Coal Creek; and one feature flowing south to north east of SH-4 and south of Fox Lane). Existing concrete drainage ditches, as well as the successive growth of riparian woodlands surrounding the defined bed and banks of these features, suggest that there is persistent hydrology which is characteristic of intermittent streams.

Alternative 2 is likely to impact three of the four non-mapped features, while Alternatives 1 and 3 will impact all six features. The total linear footage of assumed impact was 968 linear feet for Alternative 2 and 1,026 linear feet for Alternatives 1 and 3. All three Alternatives were assigned a "Medium Impact" for Non-mapped Stream impacts because linear foot impact exceeds the Nationwide 14 permit length of 300 feet.

Tribal Property

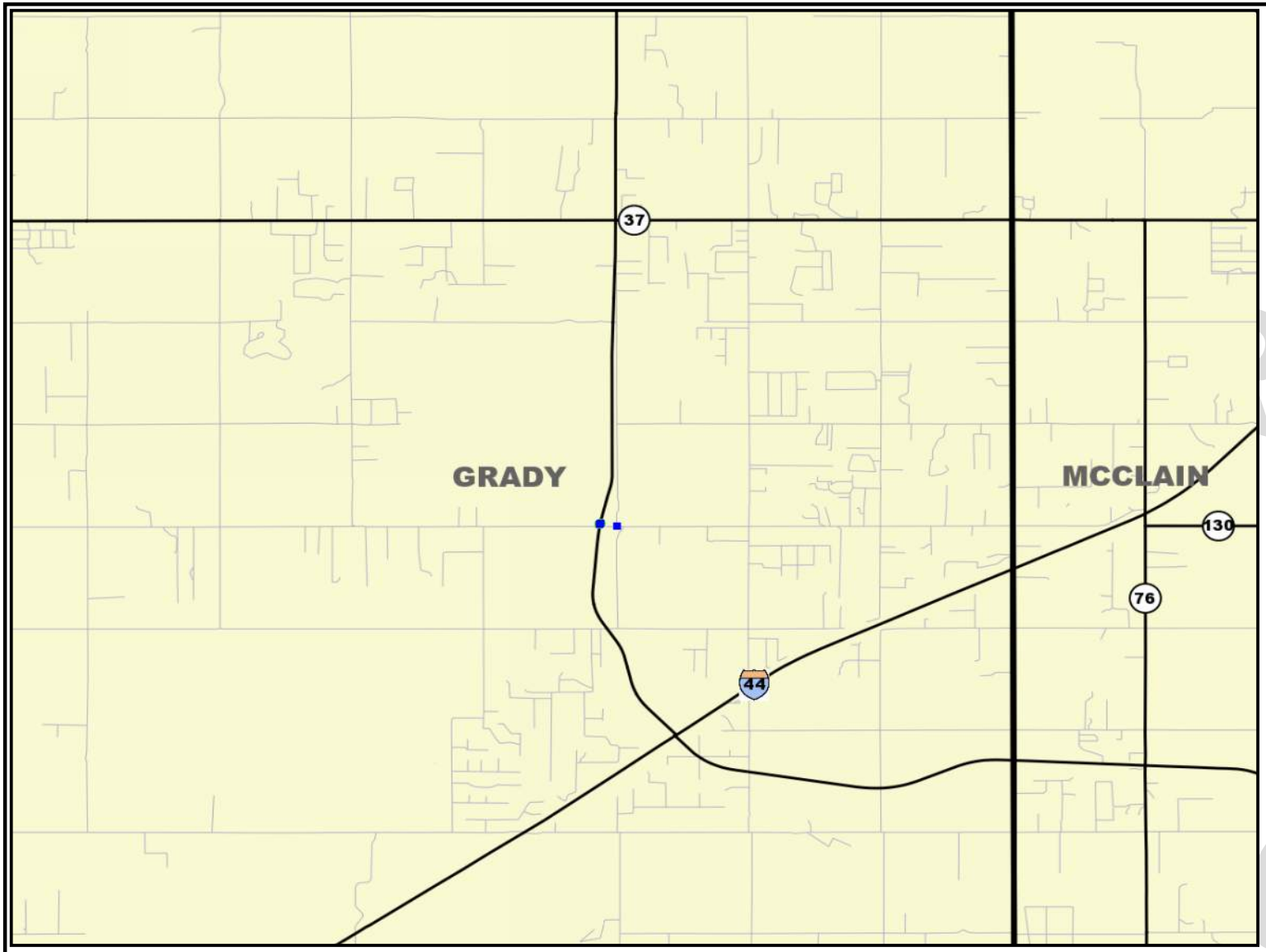
The study's reconnaissance area was assessed for tribal lands or land held in trust by the Bureau of Indian Affairs (BIA). Property ownership information was reviewed as part of the overall effort, and no Native American or tribal properties were identified; consequently, all Alternatives were assigned a "No Impact" designation in the matrix.

Wetland Impacts

Wetland impacts were assessed by reviewing the National Wetland Inventory (NWI) maps along with preliminary desktop review of aerial imagery. One wetland feature was identified flowing south to north across Fox Lane, east of SH-4 and emptying into Coal Creek. This feature was classified as PFO1A, but was not associated with a USGS-mapped stream. Review of the aerial imagery indicates this as a linear stream and may not meet the definition of a lentic palustrine wetland, but is likely to be jurisdictional as a lotic feature.

Consequently, no wetlands (other than in-stream features) were mapped within the recon study footprint and no additional wetland features could be identified from the aerial imagery. Given the rolling, upland terrain and the lack of identified hydric soils, jurisdictional wetlands are not likely to be present. This desktop review should not be considered a formal delineation and wetland impacts cannot be completely refuted at this stage in the study. Consequently, all Alternatives were assigned a "No Impact" designation in the matrix.

APPENDIX D
ACCIDENT HISTORY



Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021
by Lauren Romano

Study Map & Totals

Legend

- Fatality
- Injury
- Property Damage

N
W E
S

Remarks:

NONE

SH-4 FOX LANE

Date Range: 08-26-2011 thru 08-26-2021

	2011						2012						2013					
	Fat	SRS Inj	Non-Incap Inj	Poss Inj	PD	Tot	Fat	SRS Inj	Non-Incap Inj	Poss Inj	PD	Tot	Fat	SRS Inj	Non-Incap Inj	Poss Inj	PD	Tot
Collisions				1		1					1	1			3	2		5
Persons				1		1						0			8	9		17

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021 by Lauren Romano

	2014						2015						2016					
	Fat	SRS Inj	Non-Incap Inj	Poss Inj	PD	Tot	Fat	SRS Inj	Non-Incap Inj	Poss Inj	PD	Tot	Fat	SRS Inj	Non-Incap Inj	Poss Inj	PD	Tot
Collisions			1		1	2			2		1	3						0
Persons			4			4			5	1		6						0

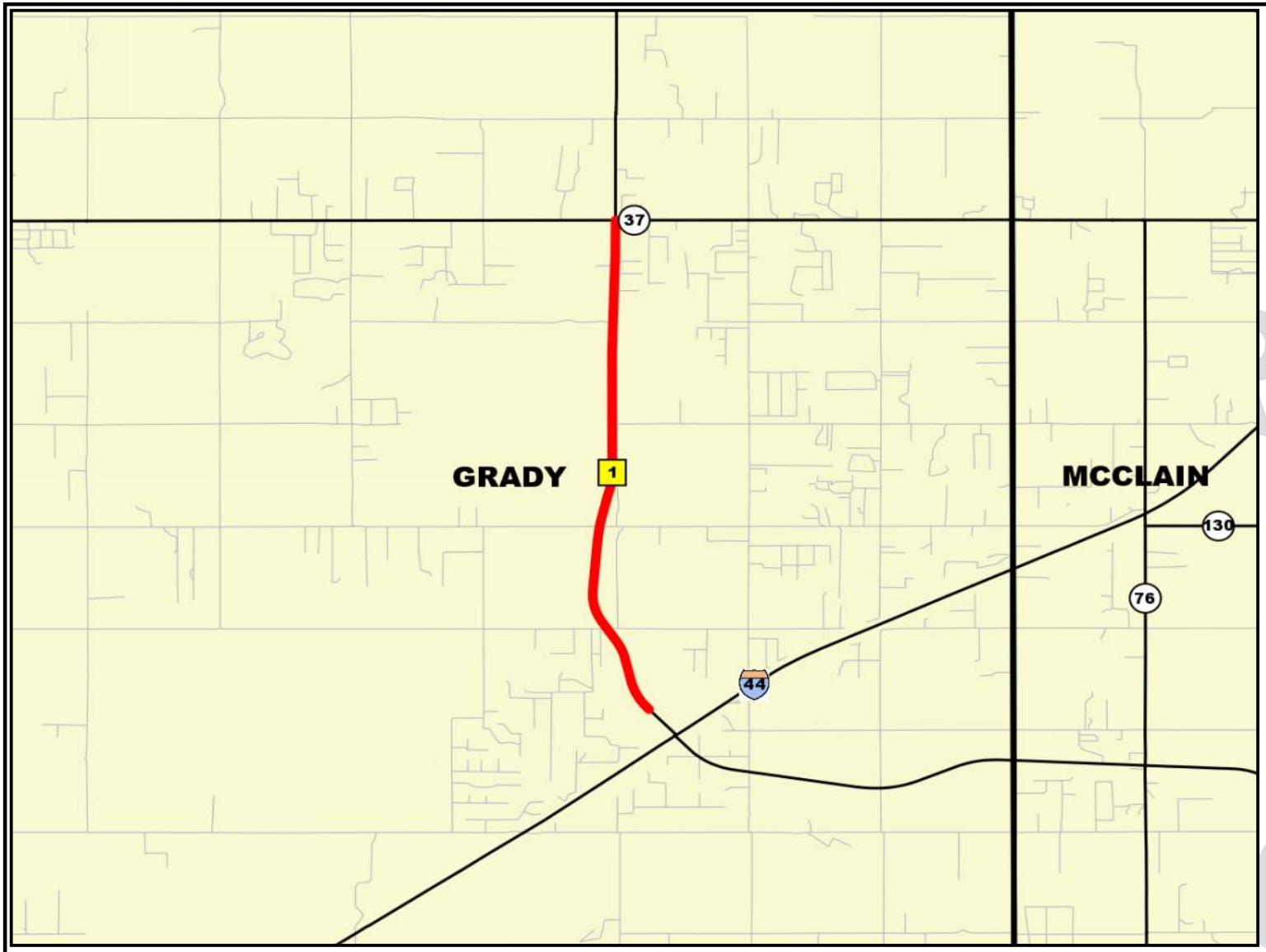
	2017						2018*						2019*					
	Fat	SRS Inj	Non-Incap Inj	Poss Inj	PD	Tot	Fat	SRS Inj	Non-Incap Inj	Poss Inj	PD	Tot	Fat	SRS Inj	Non-Incap Inj	Poss Inj	PD	Tot
Collisions				1	3	4			1		1	2						0
Persons				1		1			3			3						0

* DENOTES A YEAR FOR WHICH DATA MAY BE INCOMPLETE.

	2020*						2021*					
	Fat	SRS Inj	Non-Incap Inj	Poss Inj	PD	Tot	Fat	SRS Inj	Non-Incap Inj	Poss Inj	PD	Tot
Collisions			1		2	3			1			1
Persons			2			2			1			1

* DENOTES A YEAR FOR WHICH DATA MAY BE INCOMPLETE.

	Study Total					
	Fatality	Suspected Serious Injury	Non-Incapacitating Injury	Possible Injury	Property Damage	Total
Collisions			9	4	9	22
Persons			23	12		35



Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021
by Lauren Romano

Sliding Scale Analysis Map

Severity Index

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- 44 - 43
- 44 - 43

N
W
E
S

SH-4 FOX LANE

Grady County

Collision Window Data : 08-26-2011 Thru 08-26-2021

Maximum Segment Length : 5 miles

SLIDING SCALE ANALYSIS WINDOWS

SH-4 FOX LANE

Date Range: 08-26-2011 Thru 08-26-2021

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021 by Lauren Romano

COLLISION WINDOW DATA : 08-26-2011 Thru 08-26-2021

	Window Start								Window Stop								# Crashes								
Rank #	County	CS	Rdwy	Mile Point	Int #	Int Hwy	MM	Location	County	CS	Rdwy	Mile Point	Int #	Int Hwy	MM	Location	Fat	Sus Inj	N-Inc Inj	Poss Inj	PDO	Total	Win Len	ADT	Sev Index
1	26-Grady	50	SH-4	00.26				HEB TP RAMPS *	26-Grady	50	SH-4	05.26	25	SH-37		MAIN ST.			9	4	9	22	5.00	6190	44

*** Location Near But Not At Point**

SEVERITY INDEX = (1 * NUMBER OF PROPERTY DAMAGE ONLY COLLISIONS) + (2 * NUMBER OF POSSIBLE INJURY COLLISIONS) + (3 NUMBER OF NON INCAPACITATING INJURY COLLISIONS) + (4 * NUMBER OF SUSPECTED SERIOUS COLLISIONS) + (5 * NUMBER OF FATALITY COLLISIONS)

STUDY TOTALS - BY CITY AND HWY CLASS

SH-4 FOX LANE

Date Range: 08-26-2011 Thru 08-26-2021

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021 by Lauren Romano

STUDY TOTALS

	HIGHWAY COLLISIONS				CITY STREET COLLISIONS				COUNTY ROAD COLLISIONS				TOTAL COLLISIONS			
Year	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot
2011		1		1										1		1
2012			1	1											1	1
2013		5		5										5		5
2014		1	1	2										1	1	2
2015		2	1	3										2	1	3
2017		1	3	4										1	3	4
2018 *		1	1	2										1	1	2
2020 *		1	2	3										1	2	3
2021 *		1		1										1		1
Total:		13	9	22				0				0		13	9	22

*** DENOTES A YEAR FOR WHICH DATA MAY BE INCOMPLETE.**

County: (26) GRADY

	HIGHWAY COLLISIONS				CITY STREET COLLISIONS				COUNTY ROAD COLLISIONS				TOTAL COLLISIONS			
	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot
(00) - RURAL -		13	9	22										13	9	22

*** INCLUDES SUSPECTED SERIOUS, NON-INCAPACITATING, AND POSSIBLE INJURIES.**

TABULATION OF COLLISIONS

SH-4 FOX LANE

Date Range: 08-26-2011 Thru 08-26-2021

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021 by Lauren Romano

Collisions By Type Of Collision

Type Of Collision	2011				2012				2013				2014				2015			
	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot
Rear-End (front-to-rear)										1		1								
Head-On (front-to-front)																				
Right Angle (front-to-side)							1	1		3		3		1		1		2	1	3
Angle Turning															1	1				
Other Angle																				
Sideswipe Same Direction		1		1																
Sideswipe Opposite Direction																				
Fixed Object																				
Pedestrian																				
Pedal Cycle																				
Animal																				
Overturn/Rollover																				
Vehicle-Train																				
Other Single Vehicle Crash																				
Other										1		1								
Total		1		1			1	1		5		5		1	1	2		2	1	3
Percent		4.5		4.5			4.5	4.5		22.7		22.7		4.5	4.5	9.1		9.1	4.5	13.6

Collisions By Type Of Collision

Type Of Collision	2016				2017				2018*				2019*				2020*			
	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot
Rear-End (front-to-rear)																				
Head-On (front-to-front)																				
Right Angle (front-to-side)							3	3		1		1						1		1
Angle Turning											1	1								
Other Angle																				
Sideswipe Same Direction																				
Sideswipe Opposite Direction																				
Fixed Object																				
Pedestrian																				
Pedal Cycle																				
Animal																				
Overturn/Rollover						1		1												
Vehicle-Train																				
Other Single Vehicle Crash																				
Other																			2	2
Total						1	3	4		1	1	2						1	2	3
Percent						4.5	13.6	18.2		4.5	4.5	9.1						4.5	9.1	13.6

*** INCLUDES SUSPECTED SERIOUS, NON-INCAPACITATING, AND POSSIBLE INJURIES.**

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021 by Lauren Romano

TABULATION OF COLLISIONS

SH-4 FOX LANE

Date Range: 08-26-2011 Thru 08-26-2021

Collisions By Type Of Collision

Type Of Collision	2021*				Total				
	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Pct
Rear-End (front-to-rear)						1		1	4.5
Head-On (front-to-front)									
Right Angle (front-to-side)						8	5	13	59.1
Angle Turning		1		1		1	2	3	13.6
Other Angle									
Sideswipe Same Direction						1		1	4.5
Sideswipe Opposite Direction									
Fixed Object									
Pedestrian									
Pedal Cycle									
Animal									
Overturn/Rollover						1		1	4.5
Vehicle-Train									
Other Single Vehicle Crash									
Other						1	2	3	13.6
Total		1		1		13	9	22	100
Percent		4.5		4.5		59.1	40.9	100	

* INCLUDES SUSPECTED SERIOUS, NON-INCAPACITATING, AND POSSIBLE INJURIES.

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021 by Lauren Romano

Units By Unit Type

Unit Type	2011				2012				2013				2014				2015			
	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot
Train																				
Pedestrian																				
Animal																				
Pedal Cycle																				
Parked Vehicle																				
CMV							1	1												
Other Single Vehicle																				
Other Multi-Vehicle		2		2			1	1		10		10		2	2	4		4	2	6
Total		2		2			2	2		10		10		2	2	4		4	2	6
Percent		4.7		4.7			4.7	4.7		23.3		23.3		4.7	4.7	9.3		9.3	4.7	14.0

Units By Unit Type

Unit Type	2016				2017				2018*				2019*				2020*			
	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot
Train																				
Pedestrian																				
Animal																				
Pedal Cycle																				
Parked Vehicle																				
CMV						1	1	2											1	1
Other Single Vehicle																				
Other Multi-Vehicle							5	5		2	2	4						2	3	5
Total						1	6	7		2	2	4						2	4	6
Percent						2.3	14.0	16.3		4.7	4.7	9.3						4.7	9.3	14.0

* INCLUDES SUSPECTED SERIOUS, NON-INCAPACITATING, AND POSSIBLE INJURIES.

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021 by Lauren Romano

Units By Unit Type

Unit Type	2021*				Total				
	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Pct
Train									
Pedestrian									
Animal									
Pedal Cycle									
Parked Vehicle									
CMV						1	3	4	9.3
Other Single Vehicle									
Other Multi-Vehicle		2		2		24	15	39	90.7
Total		2		2		25	18	43	100
Percent		4.7		4.7		58.1	41.9	100	

* INCLUDES SUSPECTED SERIOUS, NON-INCAPACITATING, AND POSSIBLE INJURIES.

TABULATION OF COLLISIONS

SH-4 FOX LANE

Date Range: 08-26-2011 Thru 08-26-2021

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021 by Lauren Romano

Vehicles By Vehicle Type

Vehice Type	2011				2012				2013				2014				2015			
	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot
Passenger Vehicle-2 Door							1	1		1		1							1	1
Passenger Vehicle-4 Door		1	1	2						4		4			1	1		2	2	4
Passenger Vehicle-Convertible																				
Pickup Truck											1	1		1		1		1		1
Single-Unit Truck (2 axles)																				
Single-Unit Truck (3 or more axles)																				
School Bus																				
Truck/Trailer							1	1												
Truck-Tractor (bobtail)																				
Truck-Tractor/Semi-Trailer																				
Truck-Tractor/Double																				
Truck-Tractor/Triple																				
Bus/Large Van (9-15 seats)																				
Bus (16+ seats)																				
Motorcycle																				
Motor Scooter/Moped																				
Motor Home																				
Farm Machinery																				
ATV																				
Sport Utility Vehicle (SUV)										2		2		1	1	2				
Passenger Van										2		2								
Truck More Than 10,000 lbs.																				
Van (10,000 lbs. or less)																				
Other																				
Total		1	1	2			2	2		9	1	10		2	2	4		3	3	6
Percent		2.3	2.3	4.7			4.7	4.7		20.9	2.3	23.3		4.7	4.7	9.3		7.0	7.0	14.0

*** INCLUDES SUSPECTED SERIOUS, NON-INCAPACITATING, AND POSSIBLE INJURIES.**

TABULATION OF COLLISIONS

SH-4 FOX LANE

Date Range: 08-26-2011 Thru 08-26-2021

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021 by Lauren Romano

Vehicles By Vehicle Type

Vehice Type	2016				2017				2018*				2019*				2020*			
	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot
Passenger Vehicle-2 Door																				
Passenger Vehicle-4 Door							3	3		1		1						1	1	2
Passenger Vehicle-Convertible							1	1												
Pickup Truck																			1	1
Single-Unit Truck (2 axles)							1	1												
Single-Unit Truck (3 or more axles)																				
School Bus																				
Truck/Trailer																				
Truck-Tractor (bobtail)																				
Truck-Tractor/Semi-Trailer																			1	1
Truck-Tractor/Double						1		1												
Truck-Tractor/Triple																				
Bus/Large Van (9-15 seats)																				
Bus (16+ seats)																				
Motorcycle																				
Motor Scooter/Moped																				
Motor Home																				
Farm Machinery																				
ATV																				
Sport Utility Vehicle (SUV)							1	1		1	2	3						1	1	2
Passenger Van																				
Truck More Than 10,000 lbs.																				
Van (10,000 lbs. or less)																				
Other																				
Total						1	6	7		2	2	4						2	4	6
Percent						2.3	14.0	16.3		4.7	4.7	9.3						4.7	9.3	14.0

*** INCLUDES SUSPECTED SERIOUS, NON-INCAPACITATING, AND POSSIBLE INJURIES.**

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021 by Lauren Romano

Vehicles By Vehicle Type

Vehice Type	2021*				Total				
	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Pct
Passenger Vehicle-2 Door						1	2	3	7.0
Passenger Vehicle-4 Door		1	1	2		10	9	19	44.2
Passenger Vehicle-Convertible							1	1	2.3
Pickup Truck						2	2	4	9.3
Single-Unit Truck (2 axles)							1	1	2.3
Single-Unit Truck (3 or more axles)									
School Bus									
Truck/Trailer							1	1	2.3
Truck-Tractor (bobtail)									
Truck-Tractor/Semi-Trailer							1	1	2.3
Truck-Tractor/Double						1		1	2.3
Truck-Tractor/Triple									
Bus/Large Van (9-15 seats)									
Bus (16+ seats)									
Motorcycle									
Motor Scooter/Moped									
Motor Home									
Farm Machinery									
ATV									
Sport Utility Vehicle (SUV)						5	5	10	23.3
Passenger Van						2		2	4.7
Truck More Than 10,000 lbs.									
Van (10,000 lbs. or less)									
Other									
Total		1	1	2		21	22	43	100
Percent		2.3	2.3	4.7		48.8	51.2	100	

* INCLUDES SUSPECTED SERIOUS, NON-INCAPACITATING, AND POSSIBLE INJURIES.

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021 by Lauren Romano

Day And Time Of Occurrence Of Collisions

Day	Hour Of The Day																									
	AM												PM													
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	Tot	Pcnt
Sunday													1												1	4.5
Monday																1	2	1			1				5	22.7
Tuesday									1		1					1									3	13.6
Wednesday								1						2										1	4	18.2
Thursday																1	1			1	1	1			5	22.7
Friday							1			1	1														3	13.6
Saturday												1													1	4.5
	Early Morning - Sunrise						Morning Peak			Mid Morning/Afternoon						PM Peak			Evening - Late Night						Tot	100
Total							3			7						7			5						22	
Percent							13.6			31.8						31.8			22.7						100	

Roadway/Lighting

Roadway Conditions	Lighting Conditions					Total	Percent
	Daylight	Darkness	Twilight	Lighted	Unknown		
Dry	11	6	1			18	81.8
Wet (Water)	2	1	1			4	18.2
Ice, Snow, or Slush							
Mud, Dirt, Gravel, or Sand							
Other							
Total	13	7	2			22	100
Percent	59.1	31.8	9.1			100	

Weather Conditions

Weather Conditions	Total	Percent
Clear	12	54.5
Clouds Present	7	31.8
Raining/Fog	3	13.6
Snowing/Sleet/Hail		
Other		
Total	22	100

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021 by Lauren Romano

Drivers By Driver Conditions

Unsafe/Unlawful	Apparently Normal			Alcohol Involved						Sleep Suspected			Drug Use Indicated			Unknown Condition			Total				
				Ability Impaired			Odor Detected																
	Fat	Inj *	PD	Fat	Inj *	PD	Fat	Inj *	PD	Fat	Inj *	PD	Fat	Inj *	PD	Fat	Inj *	PD	Fat	Inj *	PD	Total	Pcnt
Failed to Yield		8	6																	8	6	14	32.6
Failed to Stop																							
Failed to Signal																							
Improper Turn		2	1																	2	1	3	7.0
Improper Start			1																		1	1	2.3
Improper Stop																							
Improper Backing			1																		1	1	2.3
Improper Parking																							
Improper Passing																							
Improper Lane Change																							
Left of Center																							
Following Too Close																							
Unsafe Speed		1																		1		1	2.3
DWI					2															2		2	4.7
Inattention																							
Negligent Driving																							
Defective Vehicle																							
Wrong Way																							
No Improper Action		12	9																	12	9	21	48.8
Other																							
Total		23	18		2															25	18	43	100
Percent		53.5	41.9		4.7															58.1	41.9	100	

Severities Indicate Highest Severity in Collision

Collisions By Special Feature

Special Feature	Total			
	Fat	Inj *	PD	Tot
Bridge				
Work Zone				
Cross Median				
Train Collision				

* INCLUDES SUSPECTED SERIOUS, NON-INCAPACITATING, AND POSSIBLE INJURIES.

Program Provided by:
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(405) 522-0985
Created: 08/26/2021 by Lauren Romano

Intersection Collision Diagram

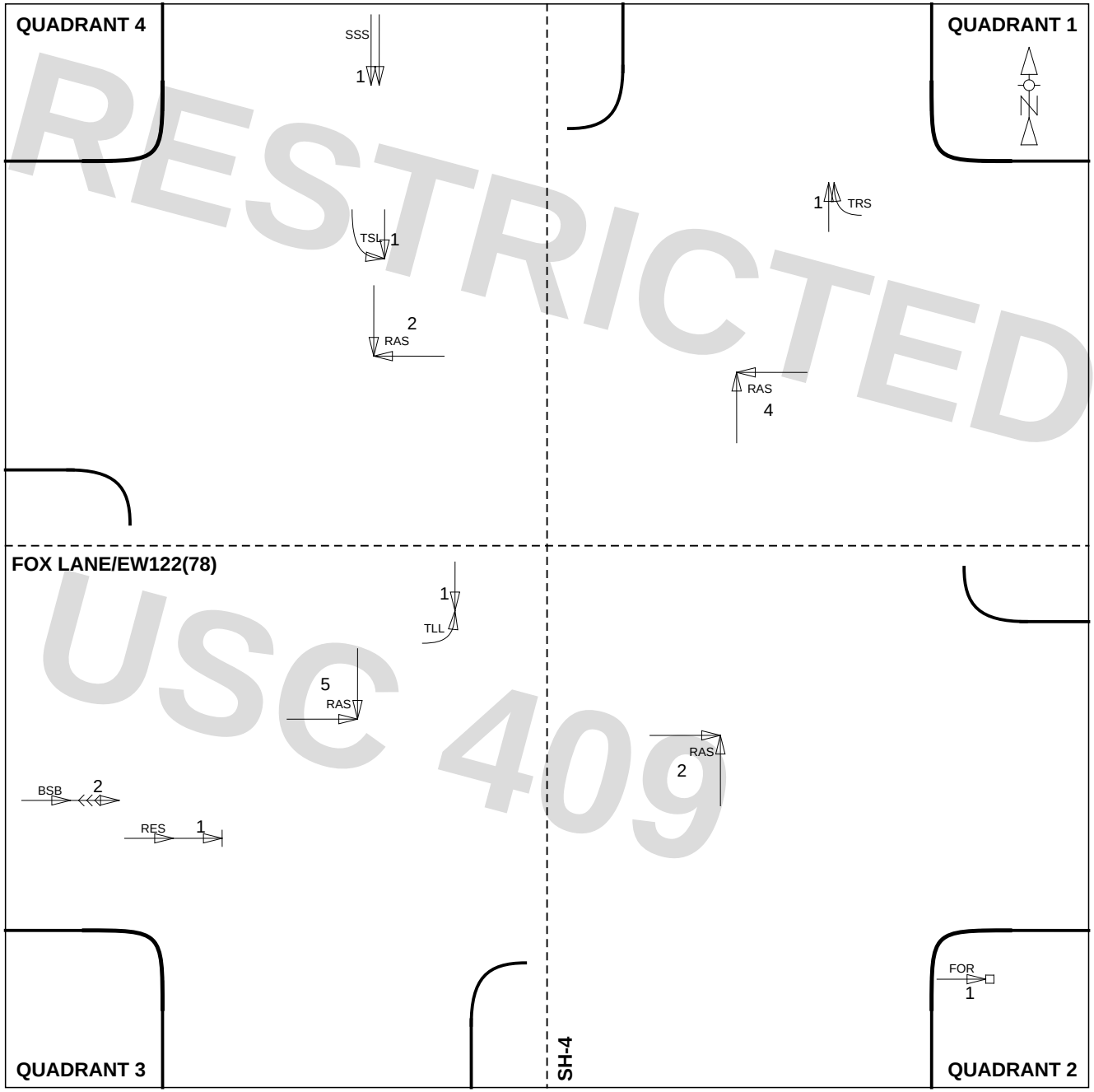
SH-4 FOX LANE

Location: GRADY County
SH-4
at
(02.24) - FOX LANE/EW122(78)

Time Period: 08-26-2011 to 08-26-2021

Printed Collisions (21)

Date	Quadrant	Manner of Collision
2012-02-01	3	RAS - RIGHT ANGLE STRAIGHT
2013-06-15	1	RAS - RIGHT ANGLE STRAIGHT
2013-07-22	2	RAS - RIGHT ANGLE STRAIGHT
2013-08-23	1	RAS - RIGHT ANGLE STRAIGHT
2014-02-11	2	RAS - RIGHT ANGLE STRAIGHT
2015-01-22	3	RAS - RIGHT ANGLE STRAIGHT
2015-06-23	3	RAS - RIGHT ANGLE STRAIGHT
2015-11-26	3	RAS - RIGHT ANGLE STRAIGHT
2017-04-20	3	RAS - RIGHT ANGLE STRAIGHT
2017-08-01	1	RAS - RIGHT ANGLE STRAIGHT
2017-12-07	1	RAS - RIGHT ANGLE STRAIGHT
2018-10-07	4	RAS - RIGHT ANGLE STRAIGHT
2020-10-14	4	RAS - RIGHT ANGLE STRAIGHT
2013-03-04	3	RES - REAR END, STOPPED
2018-05-21	3	TLL - TURNING LEFT, LEFT
2014-11-07	4	TSL - TURNING STRAIGHT, LEFT
2021-03-29	1	TRS - TURNING RIGHT, STRAIGHT
2011-12-19	4	SSS - SIDESWIPE SAME (DIRECTION)
2017-11-01	2	FOR - FIXED OBJECT, RIGHT (SIDE)
2020-02-19	3	BSB - BACKING, STOPPED, BACKING
2020-09-18	3	BSB - BACKING, STOPPED, BACKING



***** WARNING: 1 COLLISIONS NOT DIAGRAMMED *****

NOTE LETTERS DENOTE COLLISION TYPE NUMBERS DENOTE NUMBER OF OCCURENCES.

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021 by Lauren Romano

Intersection Collision Diagram

Intersection Collisions Not Printed (1)

Date	Quadrant	Manner of Collision
2013-04-11	0	UNK - UNKNOWN/DEBRIS, ECT.

Program Provided by:
Traffic Engineering Division
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(405) 522-0985
Created: 08/26/2021 by Lauren Romano

Collision Rate Point Analysis

SH-4 FOX LANE
Time Period: 08-26-2011 to 08-26-2021 (3654 days)

RATE = No. of Collisions per 100 Million Vehicles

Rate Type	Location Rates
Queried Collisions:	100.65
Fatal Collisions:	0.00
Vis. Injury Collisions *:	41.18

Collision History Summary
(Number of Years = 10)

# Collisions		# People	
Involving Fatality:	0	Killed:	0
Vis. Injury *:	9	Vis. Injured *:	23
Poss. Injury:	4	Poss. Injured:	12
Property Damage Only:	9		
TOTAL:	22		

* Includes Suspected Serious and Non-Incapacitating Injuries.

Road Characteristics

Roadway Length (miles):	00.00
Roadway Width (feet):	24
Number of Lanes :	TWO-LANES
Access Control :	NONE
Urban Area Type :	RURAL
Rural or Municipal :	RURAL
Median Type :	UNDIVIDED
Median Width (feet):	0

List of Intersection LEG ADTs.

SH-4 : 5982 (Main CS, Mile pt. 02.24)

SH-4 : 5982 (Main CS, Mile pt. 02.24)

$$\text{RATE} = \frac{100{,}000{,}000 \times \text{NO. OF COLLISIONS}}{\text{ENTERING VEHICLES} \times \text{NO. OF DAYS IN REPORT}}$$

$$\text{ENTERING VEHICLES} = \frac{\text{SUM INTERSECTION LEG ADTs}}{2}$$

HIGHWAY SYSTEM COLLISION LISTING

SH-4 FOX LANE

Date Range: 08-26-2011 Thru 08-26-2021

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021 by Lauren Romano

Cnty	City	CS #	Int. #	Mile Post	Location	Features	Int. Related	On Map	Dir. 1	Dir. 2	# Veh.	# Inj.*	# Fat.	Type of Collision	Unsafe Unlawful	Lighting Cond.	Roadway Cond.	Severity	Date
(26) GRADY				(00)	HWY: SH-4									AT: FOX LANE/EW122(78)					
26		50		02.24	FOX LANE/EW122(78)		YES	Y	S	S	2	1		SIDESWIPE-SAME	IMP-TURN	DARK	WET	P INJ	12-19-2011
26		50		02.24	FOX LANE/EW122(78)		YES	Y	E	S	2			RIGHT-ANGLE	F-YIELD	DYLGT	DRY	PDO	02-01-2012
26		50		02.24	FOX LANE/EW122(78)		YES	Y	E	E	2	1		REAR-END	D-W-I	DARK	DRY	P INJ	03-04-2013
26		50		02.24	FOX LANE/EW122(78)		YES	Y	N	N	2	4		OTHER	IMP-TURN	DARK	DRY	N-I INJ	04-11-2013
26		50		02.24	FOX LANE/EW122(78)		YES	Y	W	N	2	2		RIGHT-ANGLE	F-YIELD	DYLGT	WET	N-I INJ	06-15-2013
26		50		02.24	FOX LANE/EW122(78)		YES	Y	N	N	2	6		RIGHT-ANGLE	F-YIELD	DYLGT	DRY	P INJ	07-22-2013
26		50		02.24	FOX LANE/EW122(78)		YES	Y	N	W	2	4		RIGHT-ANGLE	F-YIELD	DYLGT	DRY	N-I INJ	08-23-2013
26		50		02.24	FOX LANE/EW122(78)		YES	Y	E	N	2	4		RIGHT-ANGLE	F-YIELD	DARK	DRY	N-I INJ	02-11-2014
26		50		02.24	FOX LANE/EW122(78)		YES	Y	S	S	2			ANGLE-TURNING	IMP-TURN	DAWN	DRY	PDO	11-07-2014
26		50		02.24	FOX LANE/EW122(78)		YES	Y	E	S	2	1		RIGHT-ANGLE	D-W-I	DYLGT	DRY	N-I INJ	01-22-2015
26		50		02.24	FOX LANE/EW122(78)		YES	Y	E	S	2	5		RIGHT-ANGLE	F-YIELD	DYLGT	DRY	N-I INJ	06-23-2015
26		50		02.24	FOX LANE/EW122(78)		YES	Y	E	S	2			RIGHT-ANGLE	F-YIELD	DUSK	WET	PDO	11-26-2015
26		50		02.24	FOX LANE/EW122(78)		YES	Y	S	E	2			RIGHT-ANGLE	F-YIELD	DARK	DRY	PDO	04-20-2017
26		50		02.24	FOX LANE/EW122(78)		YES	Y	W	N	2			RIGHT-ANGLE	F-YIELD	DYLGT	DRY	PDO	08-01-2017
26		50		02.24	FOX LANE/EW122(78)		YES	Y	S	-	1	1		ROLLOVER	UNSAF-SPD	DARK	DRY	P INJ	11-01-2017
26		50		02.24	FOX LANE/EW122(78)		YES	Y	S	W	2			RIGHT-ANGLE	F-YIELD	DARK	DRY	PDO	12-07-2017
26		50		02.24	FOX LANE/EW122(78)		YES	Y	S	E	2			ANGLE-TURNING	F-YIELD	DYLGT	DRY	PDO	05-21-2018
26		50		02.24	FOX LANE/EW122(78)		YES	Y	W	S	2	3		RIGHT-ANGLE	F-YIELD	DYLGT	DRY	N-I INJ	10-07-2018
26		50		02.24	FOX LANE/EW122(78)		YES	Y	W	E	2			OTH-BACKING	IMP-BACK	DYLGT	WET	PDO	02-19-2020
26		50		02.24	FOX LANE/EW122(78)		YES	Y	E	E	2			OTH-BACKING	IMP-START	DYLGT	DRY	PDO	09-18-2020
26		50		02.24	FOX LANE/EW122(78)		YES	Y	S	W	2	2		RIGHT-ANGLE	F-YIELD	DYLGT	DRY	N-I INJ	10-14-2020
26		50		02.24	FOX LANE/EW122(78)		YES	Y	N	W	2	1		ANGLE-TURNING	F-YIELD	DYLGT	DRY	N-I INJ	03-29-2021

*** INCLUDES SUSPECTED SERIOUS, NON-INCAPACITATING, AND POSSIBLE INJURIES.**

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 08/26/2021 by Lauren Romano

ROADWAY / REGION

QUERY OVER	SELECTIONS
Control Section	County: 26, Control Section: 50, CS Type: hwy, CS Query On: intersection, Mile: 02.24

DATE

Date Range	08-26-2011 to 08-26-2021

FILTER COLLISIONS

Roadway Type	All Collision Data
Incl. Crashes Assoc. w/ Every Int.	Checked
Environment Fields	

REPORT SECTIONS

Collision Map & Study Totals	(Included)
Sliding Scale Analysis	(Included)
- Maximum Window Length	5 miles
- Pad Windows to Max Length	Checked
- Number of Windows	Top 50
- Rank By	Severity Index
Collision Analysis Tables	(Included)
- Totals By City, Hwy Class	Checked
- Other Analysis Tables	Checked
Collision Diagram	(Included)
- Manually Configure Diagrams	Checked
- Set Diagrams To	Automatic
Rate Analysis	(Included)
Collision Listing	(Included)
- Highway Collision Listing	Checked, By Control Section
- City Street Collision Listing	Checked
- County Road Collision Listing	Checked
Query Criteria	(Included)

APPENDIX E
INTERSECTION SAFETY REPORT

INTERSECTION SAFETY REVIEW

SH 4 and Fox Lane
Grady County, Oklahoma
Division 7

Prepared for:
ODOT

April 2019

Prepared by:
Traffic Engineering Consultants, Inc.

DRAFT

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1.0 BACKGROUND

The intersection of SH 4 and Fox Lane as indicated in **Figure 1** is located in the vicinity of Bridge Creek in northern Grady County, approximately 2.25 miles north of the I-44 (H.E. Bailey Turnpike) and H.E. Bailey Spur interchange. The intersection is the first full access intersection north of this interchange.

SH 4 is a two-lane minor arterial with estimated ADT of 9,000 vpd north of Fox Lane and 7,300 vpd south of Fox Lane. The posted speed limit on SH 4 is 65 mph. At the intersection, SH 4 includes separate left-turn and right-turn lanes.

Fox Lane is a two-lane rural section line road with an estimated ADT of 1,900 vpd west of SH 4 and 2,700 vpd east of SH 4. The posted speed limit on Fox Lane is 45 mph. The intersection as indicated in **Figure 2** is a two-way stop-controlled intersection with stop control on the minor approaches (Fox Lane). The field review notes indicating the current conditions of the intersection are included on **Figure 2**.

2.0 TRAFFIC DATA

A 24-hour turning movement count was conducted at the intersection on Tuesday, April 9, 2019. The data collected from this count is summarized in **Figure 3** and included in the appendix. The data indicates that the traffic increases along SH 4 north of Fox Lane by approximately 23% due to traffic entering and exiting the highway from the east and west. The highest volume enters and exits from the east. This traffic appears to be generated by the nearby residential areas and is due to the intersection being the closest, full access intersection to Bridge Creek. The peak traffic periods occurred during the a.m. peak hour (7:00-8:00) and the p.m. peak hour (4:30-5:30).

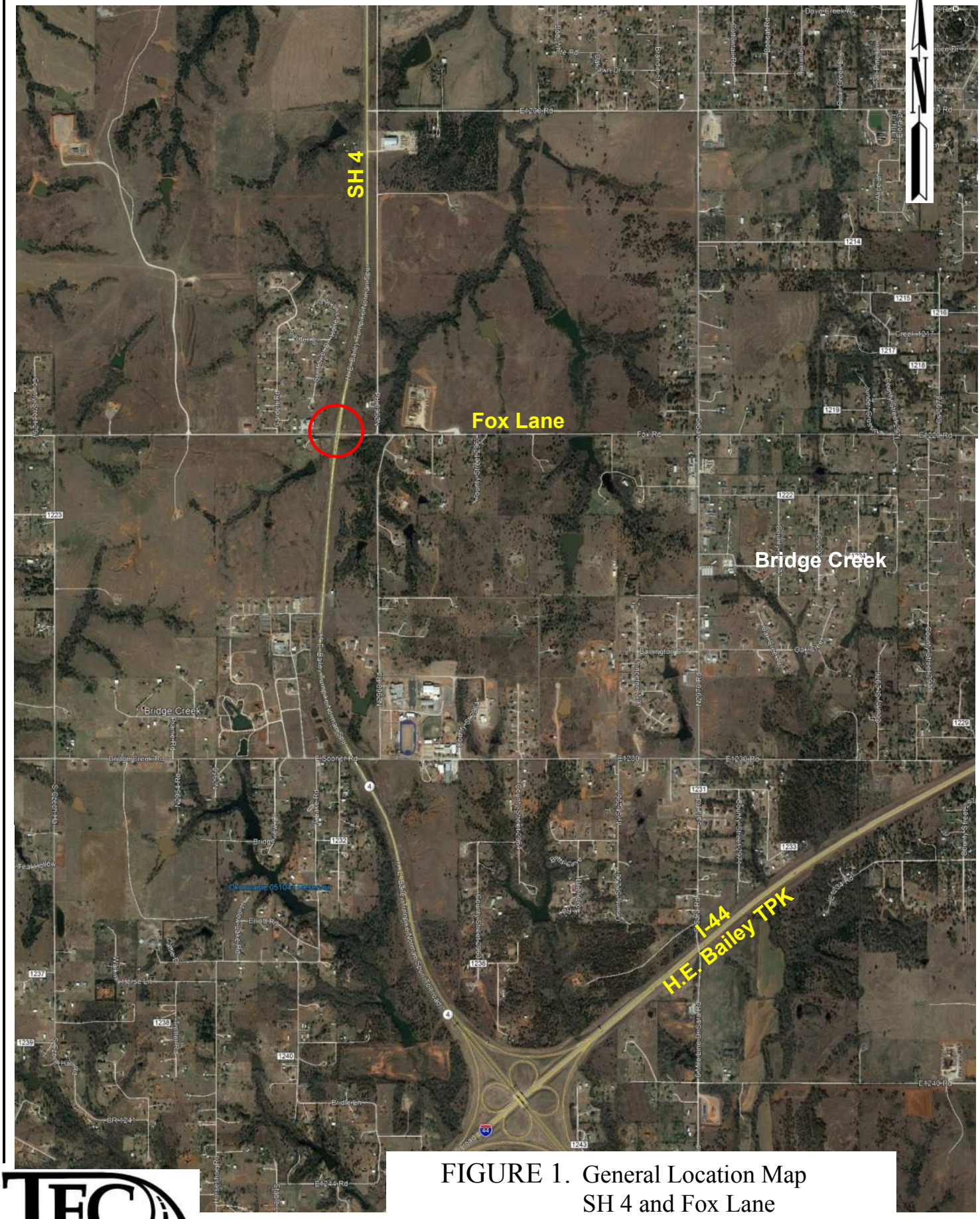


FIGURE 1. General Location Map
SH 4 and Fox Lane
Grady County, Oklahoma

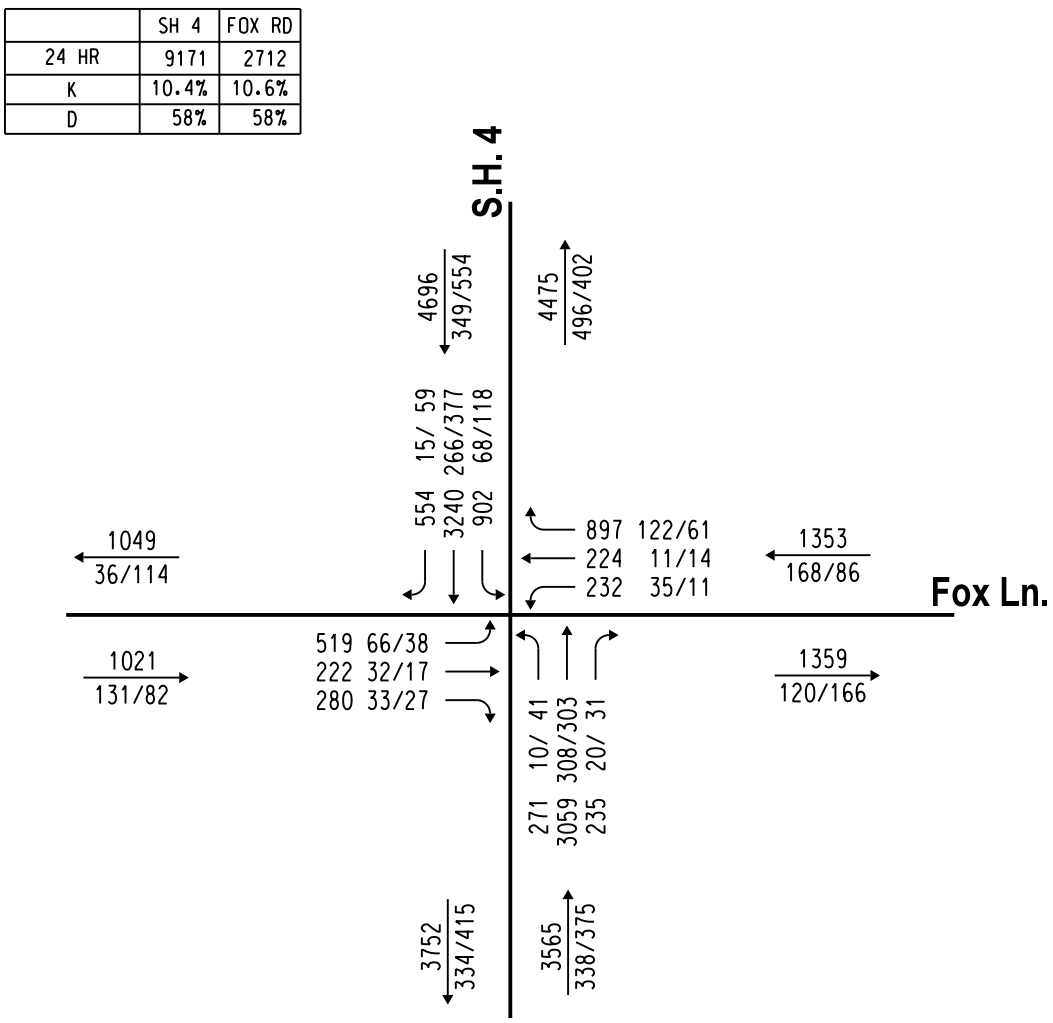
TEC
A CLEAR DIRECTION

FIELD REVIEW NOTES

- The study intersection is the first full access intersection located north of the I-44/SH 4 interchange that provides access to SH 4.
- Good sight distance is available along SH 4 in both NB and SB directions.
- The intersection is a two-way stop controlled (EB/WB) intersection.
- SH 4 is a 2 lane, two-way asphalt rural section highway with a posted speed limit of 65 mph.
- The intersection at Fox Ln has separate NB and SB left-turn and right-turn lanes.
- SH 4 currently has approximately 2 feet wide paved shoulders in 2 lane, two way section.
- Within the widened portion of the intersection at Fox Ln, SH 4 has no pave shoulders.
- Intersection ahead signing is provided approximately 1300 feet north of the intersection and 1250 feet south of the intersection.
- Two sets of rumble strips, constructed with multi-layers of pavement marking, are installed in the travel lanes along SH 4. Each set of rumble strips is approximately 15 feet in length. The leading edge of the first set of the SB rumble strips is located approximately 680 feet north of the intersection, with approximately 245 feet of separation between the second set. The leading edge of the first set of NB rumble strips is located approximately 675 feet south of the intersection, with approximately 185 feet of separation between the second set.
- Centerline rumble strips constructed with pavement grinding have been installed throughout the study area along SH 4.
- The current pavement marking along SH 4 throughout the intersection is in good condition.
- No street lighting is present within the intersection.
- No advance street name signs are present along SH 4.
- Fox Ln is a 2 lane, two-way asphalt rural section line road with a posted speed limit of 45 mph.
- No advance stop ahead signs are present along Fox Ln in either EB or WB direction.
- One set of Rumble strips, constructed of multi-layers of pavement marking, are present in advance of the intersection along Fox Ln. Each set of rumble strips are approximately 15 feet in length. The leading edge of the EB rumble strips is located approximately 375 feet west of the intersection. The leading edge of the WB rumble strips is located approximately 390 feet east of the intersection.
- All pavement markings, signing and rumble strips along Fox Ln are in poor condition.
- The asphalt pavement along Fox Ln, east and west of the intersection is in poor condition.

FIGURE 2. SH 4 and Fox Lane
Current Conditions

TEC
A CLEAR DIRECTION



LEGEND

XXXX XXX/XXX

24 HOUR

A.M. PEAK HOUR

P.M. PEAK HOUR

FIGURE 3. 2019 Turning Movement Traffic Data (Data Collected 04-09-19)

04/30/19 G:\0Projects\T-2709C Study, SH 4 & Fox Rd Safety Audit Task 10 - ODOT\CAD\FIG 3.dgn

TEC
A CLEAR DIRECTION

The highest turning movements occurred with traffic turning to and from the north and east. The westbound to northbound right turn volume in the a.m. peak hour and the southbound to eastbound left turn volume in the p.m. peak hour were the dominant turning movements of approximately 120 vehicles per hour during each peak period.

Additional twenty-four-hour data was collected along SH 4. The northbound counter was located south of Fox Lane and the southbound counter was located north of Fox Lane. Traffic data from these counts included volume, vehicle classification and speed. The data was collected for four full twenty-four-hour periods on April 25 through 28 that included a Thursday, Friday, Saturday and Sunday. The data collected from these counts are summarized in **Table 1** below. The volume counts confirm the turning movement data collected.

Table 1.

SH 4 Traffic Data[1]

	Northbound	Southbound	Total
24 Hr Volume (vpd)	3938	5299	9237
% Total Trucks (T)	20.18%	21.15%	
% Total Trucks DHV (T_{DHV})	16.62%	20.03%	
% Heavy Trucks (T_3)	8.30%	6.40%	
85th Percentile Speed	67	66	
Mean Speed (Average)	62	60	

[1] Summary of the Peak Weekday Volume

3.0 COLLISION DATA

The most recent five years of intersection related collision data (2014-2018) was gathered and summarized in **Tables 2 through 7**. On average, the intersection was found to experience two collisions annually. The highest number of intersection related collisions were right-angle and angle-turning types. The directions of vehicles varied in these types of crashes, however most involved southbound and eastbound vehicles. Most of the crashes involved passenger type vehicles and occurred in clear weather, during the p.m. peak hour traffic period.

Collision Data Summary - SH 4 and Fox Rd

INTERSECTION RELATED COLLISIONS

TABLE 2.
Year, Number and Type of Collision

Year	Type of Collision								Total
	Rear-End	Right Angle	Angle Turning	Side S Same Dir	Side S Opp Dir	Fixed Object	Overturn Rollover	Other	
2014		1	1						2
2015		3							3
2016									0
2017		3					1		4
2018		1	1						2
Total	0	8	2	0	0	0	1	0	11
Percent	0%	73%	18%	0%	0%	0%	9%	0%	100%

TABLE 3.
Time of Day of Collision

Time of Day	No. of Collisions	Percent
Early AM	0	0%
AM Peak	2	18%
Noon Peak	2	18%
PM Peak	4	36%
Late PM	3	27%
Total	11	100%

TABLE 4.
Weather Conditions

Weather Conditions	No. of Collisions	Percent
Clear	6	55%
Clouds Present	4	36%
Raining / Fog	1	9%
Snow/Sleet/Hail	0	0%
Total	11	100%

TABLE 5.
Vehicles by Type

Type of Vehicle	No. of Vehicles
Pass. Veh.	17
Pick Up Trk	2
S Unit Trk	1
Trk/Trailer	1
Mtrcycle	0
Total	21

TABLE 6.
Direction of Travel, Type of Collision - Intersection Related

Direction of Travel		No. of Collisions	Collision Type	Cause
Veh. 1	Veh. 2			
E	N	1	Right - Angle	Failure to Yield
S	S	1	Angle - Turning	Improper Turn
E	S	1	Right - Angle	D-W-I
E	S	2	Right - Angle	Failure to Yield
S	E	1	Right - Angle	Failure to Yield
W	N	1	Right - Angle	Failure to Yield
S	-	1	Rollover	Unsafe Speed
S	W	1	Right - Angle	Failure to Yield
S	E	1	Angle - Turning	Failure to Yield

TABLE 7.
Severity

Severity	No. of Collisions
P INJ	1
N-I INJ	4
PDO	6

4.0 INTERSECTION CAPACITY ANALYSIS

Intersection capacity analyses were conducted on the intersection under the current a.m. and p.m. peak hour periods. The results summarized in **Table 8** below and included in the appendix indicate the eastbound approach currently operates at a level-of-service "F" during both peak hour traffic periods. The longer delays on this approach are attributed to the higher left-turn volumes waiting for gaps in traffic in both northbound and southbound directions.

Table 8.
Intersection Capacity Analysis Summary

Intersection	Type of Traffic Control	AM Peak Hour					PM Peak Hour				
		Critical Approach			Intersection		Critical Approach			Intersection	
		Approach	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS[1]	Approach	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS[1]
2019 Existing Traffic and Existing Traffic Control Conditions											
SH 4 and Fox Lane	Unsignalized	EB	117.6	F	23.8	C	EB	52.0	F	7.6	A

[1] Estimated Level-of-Service. Value not reported in HCS for Two-way stop condition.

5.0 TRAFFIC SIGNAL WARRANT ANALYSIS

To review the need for alternative traffic control measures at the intersection, a traffic signal warrant analysis was conducted. The analysis was conducted in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). This publication is a federally approved document which governs the traffic engineering practices across the country. The MUTCD includes eight set of thresholds or warrants that may be evaluated at an intersection to determine whether or not a traffic signal could be considered as a method of traffic control. Typically, the conditions at an intersection must satisfy more than one warrant for the consideration of a traffic signal.

The traffic signal warrant conducted utilized the 24-hour turning movement count data for this analysis. The results, included in the appendix, indicate the intersection satisfied only Warrant 3A, Peak Hour Delay of all the volume warrants reviewed. Based on these results, no change in traffic control to include signalization should be considered for this intersection at this time.

6.0 SUMMARY OF FINDINGS

- The daily traffic volume along SH 4, north of the Fox Lane intersection is approximately 9,000 vehicles per weekday.
- Due to the volume of traffic turning to and from Fox Lane, the volume of traffic along SH 4 drops to approximately 7,300 vehicles per weekday south of Fox Lane.
- The highest turning movement volumes at the intersection are turning to/from the east during the a.m. and p.m. peak hour periods.
- High truck volumes are traveling along SH 4.
- The vehicles traveling along SH 4 are currently traveling approximately at the posted speed limit of 65 mph.
- There are currently very few collisions occurring at the intersection annually.
- The southbound SH 4 and eastbound Fox Lane traffic movements in the intersection experience the most collisions. Of these, the southbound and eastbound right-angle collisions occurred most often.
- The largest majority of the collisions that occurred in the intersection between 2014 and 2018 involved passenger type vehicles during clear weather, during the a.m. and p.m. peak hour traffic periods.

7.0 SAFETY ISSUES IDENTIFIED

1. Issue – Line of sight for eastbound Fox Lane vehicles is blocked by SH 4 right-turn Vehicles utilizing the southbound right-turn lane.

   Risk – Eastbound Fox Lane left-turn and straight crossing drivers can't adequately judge a gap in traffic to complete maneuver.

   Possible Counter Measures –

   Install intersection ahead sign with flasher

   Install speed reduction plaque on intersection ahead sign

   Widen southbound lanes to provide more separation between southbound through and right-turn lane (off-set right-turn)

2. Issue – Visibility of SH 4 intersection for eastbound Fox Lane vehicles is masked by grade from approximately 600 feet east of intersection.

   Risk – Eastbound Fox Lane vehicles don't notice the location of the intersection soon enough.

   Possible Counter Measures –

   Install stop ahead signs in advance of existing rumble strips.

   Improve/reinstall rumble strips

   Improve/reinstall pavement markings

APPENDIX

Fox Lane & SH 4 - TMC
Tue Apr 9, 2019
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 642302, Location: 35.247351, -97.726109

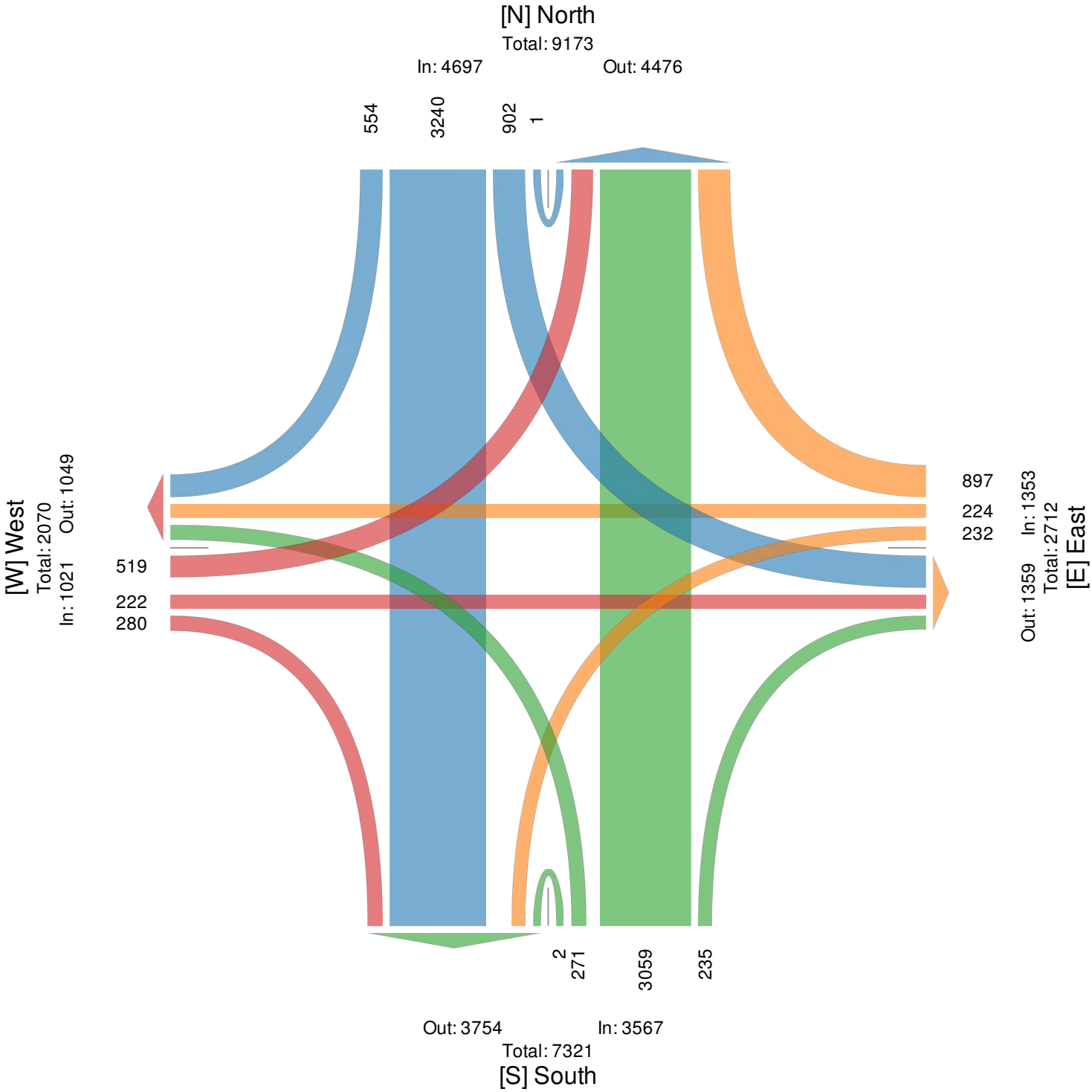
Provided by: Traffic Engineering Consultants, Inc.
6000 S. Western Ave, Suite 300,
Oklahoma City, OK, 73139, US

Leg	North					East					South					West					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2019-04-09 12:00AM	4	9	1	0	**14**	4	2	1	0	**7**	0	9	3	0	**12**	1	0	1	0	**2**	**35**
1:00AM	1	6	0	0	**7**	3	0	0	0	**3**	1	8	0	0	**9**	1	0	1	0	**2**	**21**
2:00AM	1	18	1	0	**20**	2	0	2	0	**4**	1	7	0	0	**8**	1	0	0	0	**1**	**33**
3:00AM	3	12	2	0	**17**	3	2	0	0	**5**	1	10	1	0	**12**	0	0	3	0	**3**	**37**
4:00AM	2	36	8	0	**46**	18	0	3	0	**21**	2	35	0	0	**37**	7	2	11	0	**20**	**124**
5:00AM	3	76	14	0	**93**	42	2	7	0	**51**	3	79	6	0	**88**	19	4	33	0	**56**	**288**
6:00AM	12	172	37	0	**221**	86	3	13	0	**102**	10	245	5	0	**260**	29	10	54	0	**93**	**676**
7:00AM	15	266	68	0	**349**	122	11	35	0	**168**	20	308	10	0	**338**	33	32	66	0	**131**	**986**
8:00AM	21	245	43	0	**309**	81	15	21	0	**117**	7	194	6	0	**207**	26	8	37	0	**71**	**704**
9:00AM	12	190	33	1	**236**	34	9	16	0	**59**	9	139	10	0	**158**	13	14	34	0	**61**	**514**
10:00AM	22	149	26	0	**197**	25	15	15	0	**55**	9	120	12	0	**141**	10	12	23	0	**45**	**438**
11:00AM	32	148	34	0	**214**	27	12	14	0	**53**	13	130	16	0	**159**	12	13	31	0	**56**	**482**
12:00PM	25	143	45	0	**213**	47	12	12	0	**71**	13	114	11	0	**138**	17	11	35	0	**63**	**485**
1:00PM	34	124	41	0	**199**	27	12	11	0	**50**	11	131	4	0	**146**	8	12	28	0	**48**	**443**
2:00PM	34	164	46	0	**244**	35	13	8	0	**56**	17	176	15	0	**208**	8	8	22	0	**38**	**546**
3:00PM	51	223	83	0	**357**	67	27	16	0	**110**	20	234	32	0	**286**	14	24	20	0	**58**	**811**
4:00PM	51	328	99	0	**478**	98	16	14	0	**128**	27	259	30	0	**316**	25	12	30	0	**67**	**989**
5:00PM	56	353	119	0	**528**	59	14	14	0	**87**	26	312	43	0	**381**	23	20	34	0	**77**	**1073**
6:00PM	65	207	81	0	**353**	37	14	10	0	**61**	17	187	12	0	**216**	13	10	19	0	**42**	**672**
7:00PM	35	124	48	0	**207**	39	11	11	0	**61**	9	126	14	0	**149**	5	11	13	0	**29**	**446**
8:00PM	35	104	33	0	**172**	26	17	3	0	**46**	8	89	21	0	**118**	6	8	9	0	**23**	**359**
9:00PM	20	91	21	0	**132**	9	8	4	0	**21**	9	90	11	0	**110**	2	7	8	0	**17**	**280**
10:00PM	16	35	9	0	**60**	4	6	2	0	**12**	0	43	4	1	**48**	6	3	5	0	**14**	**134**
11:00PM	4	17	10	0	**31**	2	3	0	0	**5**	2	14	5	1	**22**	1	1	2	0	**4**	**62**
Total	554	3240	902	1	**4697**	897	224	232	0	**1353**	235	3059	271	2	**3567**	280	222	519	0	**1021**	**10638**
% Approach	11.8%	69.0%	19.2%	0%	-	66.3%	16.6%	17.1%	0%	-	6.6%	85.8%	7.6%	0.1%	-	27.4%	21.7%	50.8%	0%	-	-
% Total	5.2%	30.5%	8.5%	0%	**44.2%**	8.4%	2.1%	2.2%	0%	**12.7%**	2.2%	28.8%	2.5%	0%	**33.5%**	2.6%	2.1%	4.9%	0%	**9.6%**	-
Lights	531	2963	853	1	**4348**	853	219	215	0	**1287**	213	2777	264	2	**3256**	270	212	506	0	**988**	9879
% Lights	95.8%	91.5%	94.6%	100%	**92.6%**	95.1%	97.8%	92.7%	0%	**95.1%**	90.6%	90.8%	97.4%	100%	**91.3%**	96.4%	95.5%	97.5%	0%	**96.8%**	92.9%
Articulated Trucks	14	202	29	0	**245**	26	2	9	0	**37**	12	199	0	0	**211**	3	4	5	0	**12**	505
% Articulated Trucks	2.5%	6.2%	3.2%	0%	**5.2%**	2.9%	0.9%	3.9%	0%	**2.7%**	5.1%	6.5%	0%	0%	**5.9%**	1.1%	1.8%	1.0%	0%	**1.2%**	4.7%
Buses and Single-Unit Trucks	9	75	20	0	**104**	18	3	8	0	**29**	10	83	7	0	**100**	7	6	8	0	**21**	254
% Buses and Single-Unit Trucks	1.6%	2.3%	2.2%	0%	**2.2%**	2.0%	1.3%	3.4%	0%	**2.1%**	4.3%	2.7%	2.6%	0%	**2.8%**	2.5%	2.7%	1.5%	0%	**2.1%**	2.4%

*L: Left, R: Right, T: Thru, U: U-Turn

Fox Lane & SH 4 - TMC
Tue Apr 9, 2019
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 642302, Location: 35.247351, -97.726109

Provided by: Traffic Engineering Consultants, Inc.
6000 S. Western Ave, Suite 300,
Oklahoma City, OK, 73139, US



Fox Lane & SH 4 - TMC
Tue Apr 9, 2019
AM Peak (7 AM - 8 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 642302, Location: 35.247351, -97.726109

Provided by: Traffic Engineering Consultants, Inc.
6000 S. Western Ave, Suite 300,
Oklahoma City, OK, 73139, US

Leg Direction	North Southbound					East Westbound					South Northbound					West Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2019-04-09 7:00AM	1	46	20	0	**67**	37	3	13	0	**53**	7	79	4	0	**90**	6	12	23	0	**41**	**251**
7:15AM	3	78	29	0	**110**	42	7	8	0	**57**	7	94	3	0	**104**	10	11	15	0	**36**	**307**
7:30AM	3	67	6	0	**76**	27	0	7	0	**34**	2	71	2	0	**75**	9	5	19	0	**33**	**218**
7:45AM	8	75	13	0	**96**	16	1	7	0	**24**	4	64	1	0	**69**	8	4	9	0	**21**	**210**
Total	15	266	68	0	**349**	122	11	35	0	**168**	20	308	10	0	**338**	33	32	66	0	**131**	**986**
% Approach	4.3%	76.2%	19.5%	0%	-	72.6%	6.5%	20.8%	0%	-	5.9%	91.1%	3.0%	0%	-	25.2%	24.4%	50.4%	0%	-	-
% Total	1.5%	27.0%	6.9%	0%	**35.4%**	12.4%	1.1%	3.5%	0%	**17.0%**	2.0%	31.2%	1.0%	0%	**34.3%**	3.3%	3.2%	6.7%	0%	**13.3%**	-
PHF	0.469	0.853	0.586	-	**0.793**	0.726	0.393	0.673	-	**0.737**	0.714	0.819	0.625	-	**0.813**	0.825	0.667	0.717	-	**0.799**	0.803
Lights	12	251	63	0	**326**	120	11	32	0	**163**	20	283	10	0	**313**	32	30	65	0	**127**	929
% Lights	80.0%	94.4%	92.6%	0%	**93.4%**	98.4%	100%	91.4%	0%	**97.0%**	100%	91.9%	100%	0%	**92.6%**	97.0%	93.8%	98.5%	0%	**96.9%**	94.2%
Articulated Trucks	0	12	5	0	**17**	2	0	0	0	**2**	0	22	0	0	**22**	0	1	0	0	**1**	42
% Articulated Trucks	0%	4.5%	7.4%	0%	**4.9%**	1.6%	0%	0%	0%	**1.2%**	0%	7.1%	0%	0%	**6.5%**	0%	3.1%	0%	0%	**0.8%**	4.3%
Buses and Single-Unit Trucks	3	3	0	0	**6**	0	0	3	0	**3**	0	3	0	0	**3**	1	1	1	0	**3**	15
% Buses and Single-Unit Trucks	20.0%	1.1%	0%	0%	**1.7%**	0%	0%	8.6%	0%	**1.8%**	0%	1.0%	0%	0%	**0.9%**	3.0%	3.1%	1.5%	0%	**2.3%**	1.5%

*L: Left, R: Right, T: Thru, U: U-Turn

Fox Lane & SH 4 - TMC
Tue Apr 9, 2019
AM Peak (7 AM - 8 AM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
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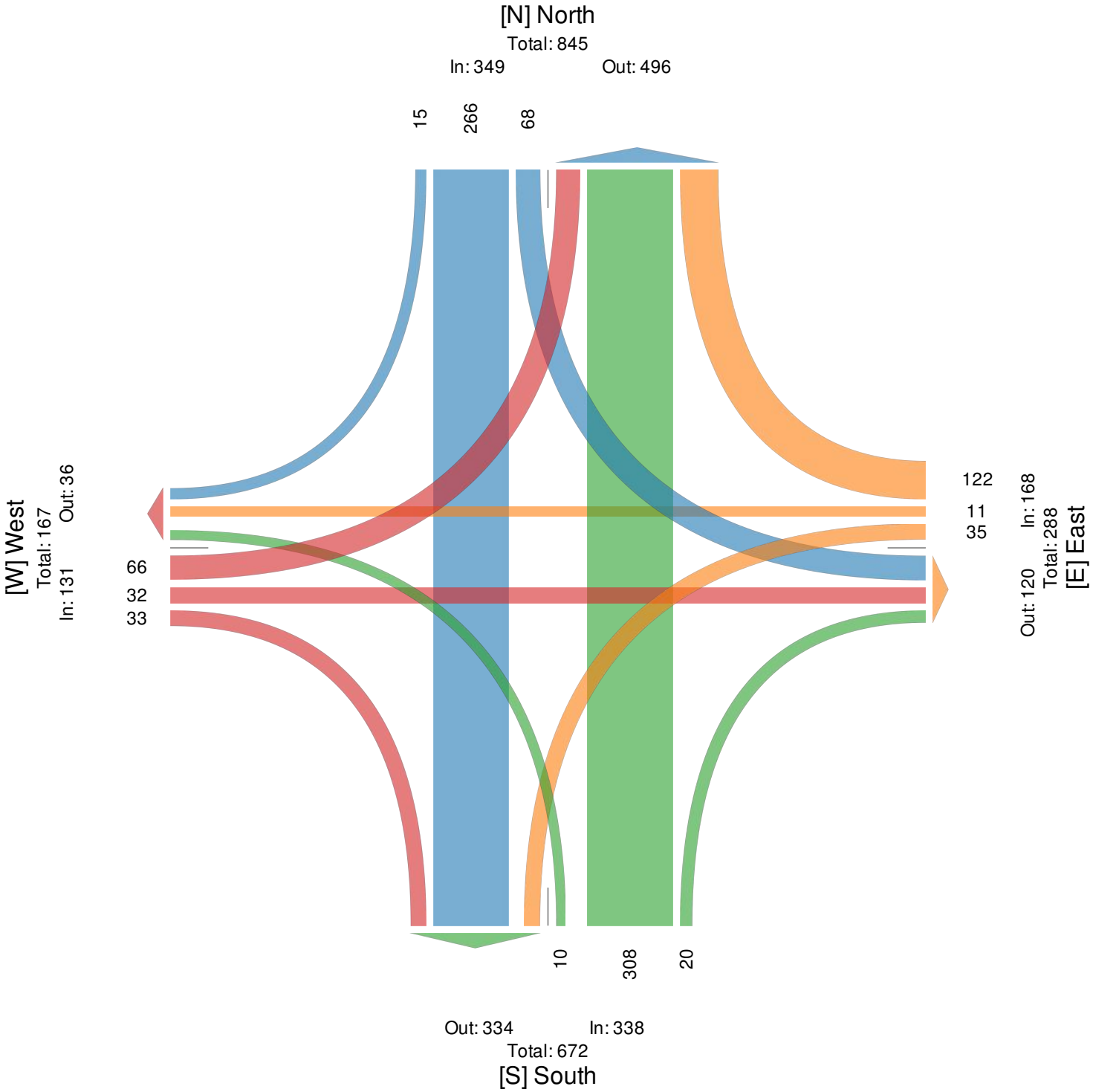


Fox Lane & SH 4 - TMC

Tue Apr 9, 2019
Midday Peak (11:15 AM - 12:15 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 642302, Location: 35.247351, -97.726109

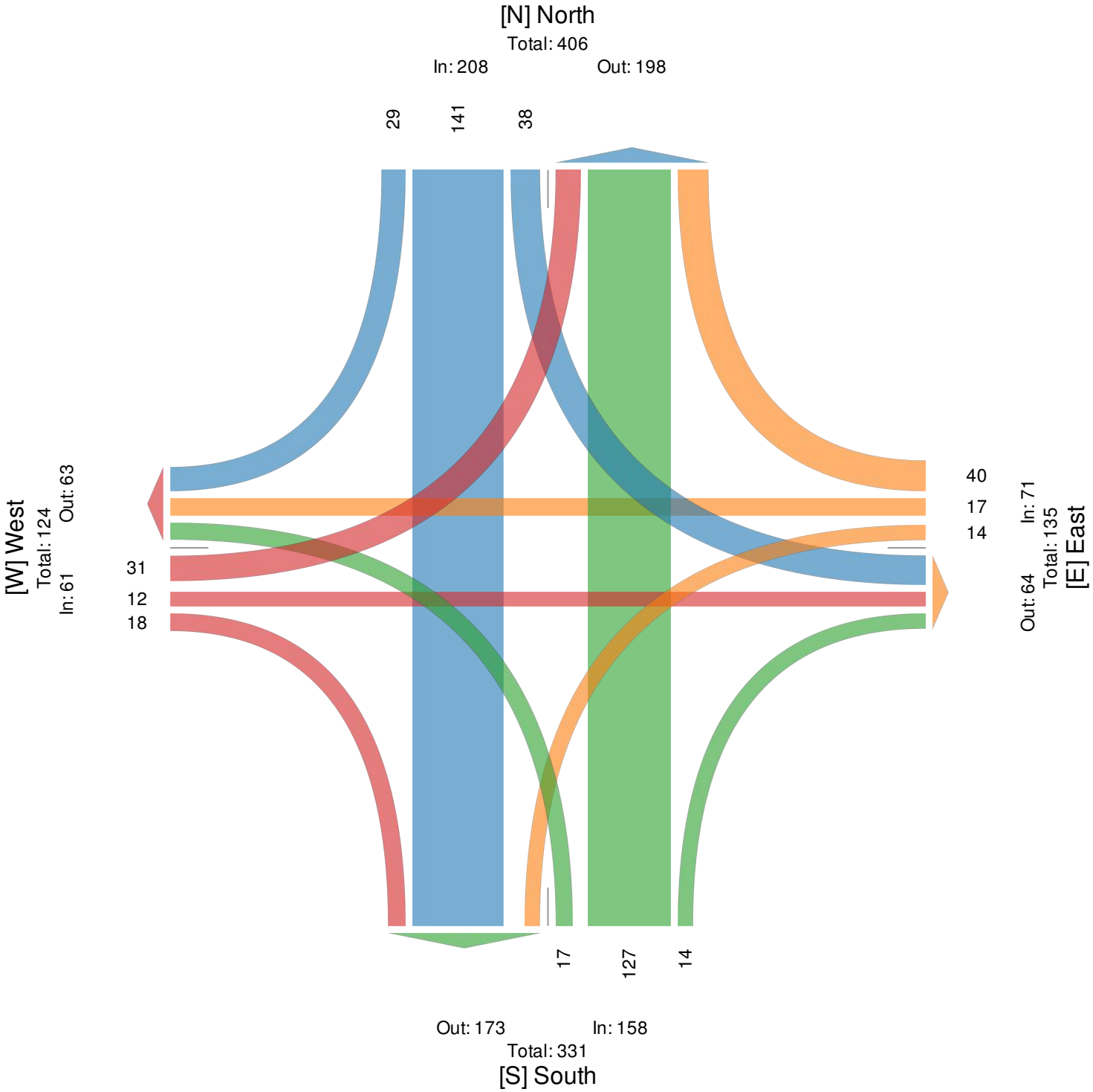
Provided by: Traffic Engineering Consultants, Inc.
6000 S. Western Ave, Suite 300,
Oklahoma City, OK, 73139, US

Leg Direction	North Southbound					East Westbound					South Northbound					West Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2019-04-09 11:15AM	9	42	7	0	**58**	9	4	3	0	**16**	1	30	6	0	**37**	4	3	6	0	**13**	**124**
11:30AM	5	32	9	0	**46**	7	3	2	0	**12**	2	38	5	0	**45**	0	1	10	0	**11**	**114**
11:45AM	11	32	12	0	**55**	7	3	7	0	**17**	8	28	3	0	**39**	7	4	7	0	**18**	**129**
12:00PM	4	35	10	0	**49**	17	7	2	0	**26**	3	31	3	0	**37**	7	4	8	0	**19**	**131**
Total	29	141	38	0	**208**	40	17	14	0	**71**	14	127	17	0	**158**	18	12	31	0	**61**	**498**
% Approach	13.9%	67.8%	18.3%	0%	-	56.3%	23.9%	19.7%	0%	-	8.9%	80.4%	10.8%	0%	-	29.5%	19.7%	50.8%	0%	-	-
% Total	5.8%	28.3%	7.6%	0%	**41.8%**	8.0%	3.4%	2.8%	0%	**14.3%**	2.8%	25.5%	3.4%	0%	**31.7%**	3.6%	2.4%	6.2%	0%	**12.2%**	-
PHF	0.659	0.839	0.792	-	**0.897**	0.588	0.607	0.500	-	**0.683**	0.438	0.836	0.708	-	**0.878**	0.643	0.750	0.775	-	**0.803**	0.950
Lights	28	124	38	0	**190**	39	17	11	0	**67**	11	102	17	0	**130**	15	12	31	0	**58**	445
% Lights	96.6%	87.9%	100%	0%	**91.3%**	97.5%	100%	78.6%	0%	**94.4%**	78.6%	80.3%	100%	0%	**82.3%**	83.3%	100%	100%	0%	**95.1%**	89.4%
Articulated Trucks	1	13	0	0	**14**	1	0	2	0	**3**	1	22	0	0	**23**	1	0	0	0	**1**	41
% Articulated Trucks	3.4%	9.2%	0%	0%	**6.7%**	2.5%	0%	14.3%	0%	**4.2%**	7.1%	17.3%	0%	0%	**14.6%**	5.6%	0%	0%	0%	**1.6%**	8.2%
Buses and Single-Unit Trucks	0	4	0	0	**4**	0	0	1	0	**1**	2	3	0	0	**5**	2	0	0	0	**2**	12
% Buses and Single-Unit Trucks	0%	2.8%	0%	0%	**1.9%**	0%	0%	7.1%	0%	**1.4%**	14.3%	2.4%	0%	0%	**3.2%**	11.1%	0%	0%	0%	**3.3%**	2.4%

*L: Left, R: Right, T: Thru, U: U-Turn

Fox Lane & SH 4 - TMC
Tue Apr 9, 2019
Midday Peak (11:15 AM - 12:15 PM)
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 642302, Location: 35.247351, -97.726109

Provided by: Traffic Engineering Consultants, Inc.
6000 S. Western Ave, Suite 300,
Oklahoma City, OK, 73139, US



Fox Lane & SH 4 - TMC

Tue Apr 9, 2019
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 642302, Location: 35.247351, -97.726109

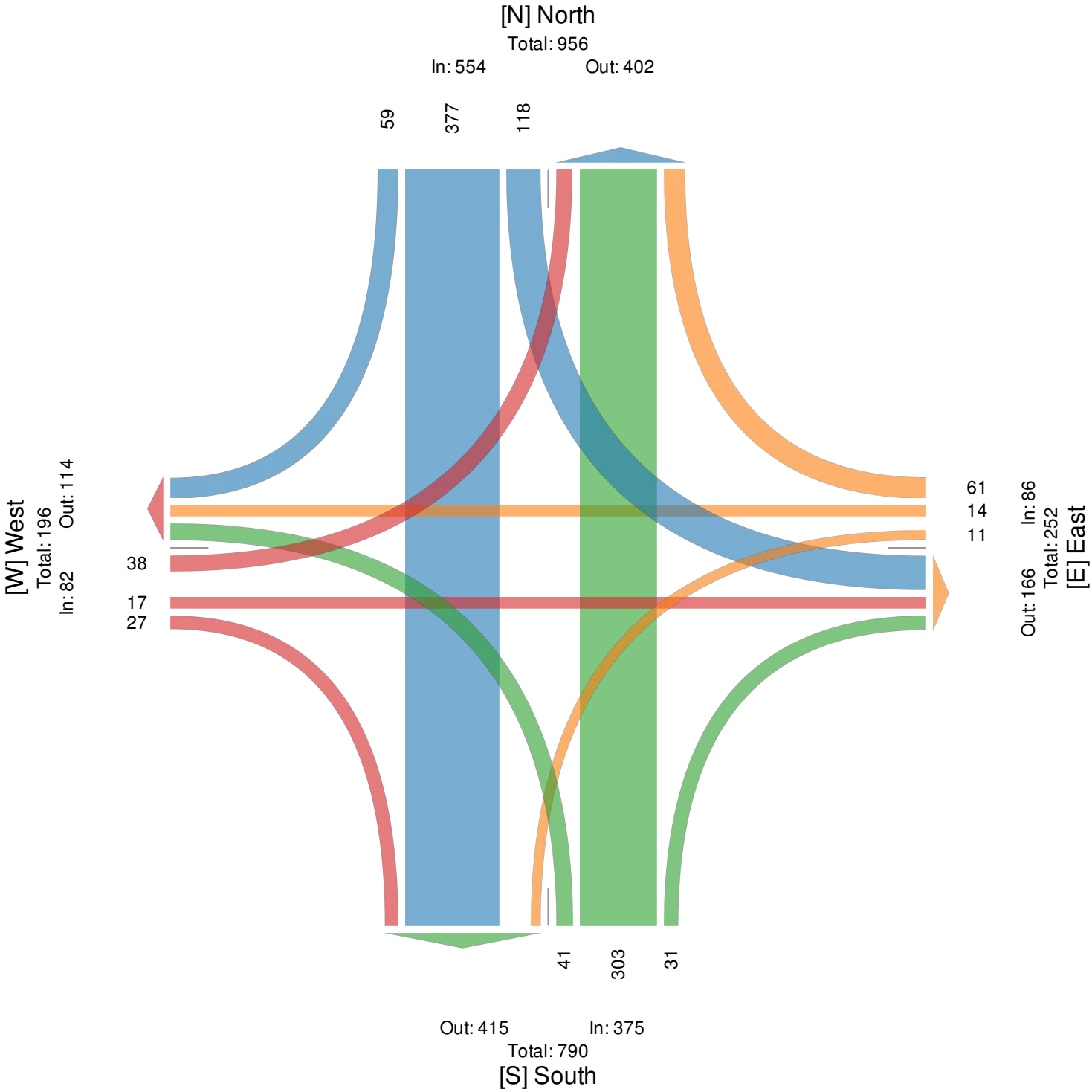
Provided by: Traffic Engineering Consultants, Inc.
6000 S. Western Ave, Suite 300,
Oklahoma City, OK, 73139, US

Leg Direction	North Southbound					East Westbound					South Northbound					West Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
2019-04-09 4:45PM	14	92	25	0	**131**	16	3	1	0	**20**	9	58	6	0	**73**	6	5	7	0	**18**	**242**
5:00PM	19	78	25	0	**122**	14	5	2	0	**21**	10	84	9	0	**103**	5	5	11	0	**21**	**267**
5:15PM	11	104	31	0	**146**	17	2	3	0	**22**	7	83	13	0	**103**	8	5	11	0	**24**	**295**
5:30PM	15	103	37	0	**155**	14	4	5	0	**23**	5	78	13	0	**96**	8	2	9	0	**19**	**293**
Total	59	377	118	0	**554**	61	14	11	0	**86**	31	303	41	0	**375**	27	17	38	0	**82**	**1097**
% Approach	10.6%	68.1%	21.3%	0%	-	70.9%	16.3%	12.8%	0%	-	8.3%	80.8%	10.9%	0%	-	32.9%	20.7%	46.3%	0%	-	-
% Total	5.4%	34.4%	10.8%	0%	**50.5%**	5.6%	1.3%	1.0%	0%	**7.8%**	2.8%	27.6%	3.7%	0%	**34.2%**	2.5%	1.5%	3.5%	0%	**7.5%**	-
PHF	0.776	0.906	0.797	-	**0.894**	0.897	0.700	0.550	-	**0.935**	0.775	0.902	0.788	-	**0.910**	0.844	0.850	0.864	-	**0.854**	0.930
Lights	58	359	113	0	**530**	58	14	11	0	**83**	31	291	39	0	**361**	27	16	37	0	**80**	1054
% Lights	98.3%	95.2%	95.8%	0%	**95.7%**	95.1%	100%	100%	0%	**96.5%**	100%	96.0%	95.1%	0%	**96.3%**	100%	94.1%	97.4%	0%	**97.6%**	96.1%
Articulated Trucks	1	13	1	0	**15**	2	0	0	0	**2**	0	9	0	0	**9**	0	0	0	0	**0**	26
% Articulated Trucks	1.7%	3.4%	0.8%	0%	**2.7%**	3.3%	0%	0%	0%	**2.3%**	0%	3.0%	0%	0%	**2.4%**	0%	0%	0%	0%	**0%**	2.4%
Buses and Single-Unit Trucks	0	5	4	0	**9**	1	0	0	0	**1**	0	3	2	0	**5**	0	1	1	0	**2**	17
% Buses and Single-Unit Trucks	0%	1.3%	3.4%	0%	**1.6%**	1.6%	0%	0%	0%	**1.2%**	0%	1.0%	4.9%	0%	**1.3%**	0%	5.9%	2.6%	0%	**2.4%**	1.5%

*L: Left, R: Right, T: Thru, U: U-Turn

Fox Lane & SH 4 - TMC
Tue Apr 9, 2019
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Movements
ID: 642302, Location: 35.247351, -97.726109

Provided by: Traffic Engineering Consultants, Inc.
6000 S. Western Ave, Suite 300,
Oklahoma City, OK, 73139, US



SH 4 Vol/Class/Speed Data (Northbound)

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 1
Station ID:
SH 4 S. of Fox Rd.

Date Start: 24-Apr-19
Date End: 29-Apr-19

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/24/19	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	0	81	48	1	20	0	0	7	7	0	0	0	0	0	164
14:00	0	90	47	1	16	0	0	8	10	0	0	0	0	0	172
15:00	0	116	67	2	22	4	0	6	11	0	0	0	0	0	228
16:00	0	143	71	3	26	3	0	6	7	0	0	0	0	0	259
17:00	0	176	109	1	43	1	0	3	4	0	0	0	0	0	337
18:00	0	174	86	2	33	2	0	7	4	1	0	0	0	0	309
19:00	1	84	74	1	12	0	0	2	2	0	0	0	0	0	176
20:00	0	67	31	0	21	1	0	6	5	0	0	0	0	0	131
21:00	0	64	29	0	12	0	0	3	4	0	0	0	0	0	112
22:00	0	27	17	0	3	0	0	3	0	0	0	0	0	0	50
23:00	0	15	6	0	14	0	0	0	1	0	0	0	0	0	36
Total	1	1037	585	11	222	11	0	51	55	1	0	0	0	0	1974
Percent	0.1%	52.5%	29.6%	0.6%	11.2%	0.6%	0.0%	2.6%	2.8%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak Vol.															
PM Peak	19:00	17:00	17:00	16:00	17:00	15:00		14:00	15:00	18:00					
Vol.	1	176	109	3	43	4		8	11	1					

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 1
Station ID:
SH 4 S. of Fox Rd.

Date Start: 24-Apr-19
Date End: 29-Apr-19

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/25/19	0	8	6	0	1	0	0	0	4	0	0	0	0	0	19
01:00	0	9	3	0	3	0	0	4	5	0	0	0	0	0	24
02:00	0	2	7	1	0	0	0	0	6	0	0	0	0	0	16
03:00	0	5	6	1	0	0	0	0	3	0	0	0	0	0	15
04:00	0	8	6	0	3	1	0	0	5	0	0	0	0	0	23
05:00	0	28	15	0	9	0	0	1	2	0	0	0	0	0	55
06:00	0	63	47	1	36	1	0	2	7	0	0	0	0	0	157
07:00	2	164	79	1	53	0	0	7	9	2	0	0	1	0	318
08:00	1	136	65	3	34	3	0	1	10	0	0	0	0	0	253
09:00	1	73	47	5	22	1	0	13	11	2	0	0	0	0	175
10:00	1	78	38	2	17	1	0	2	13	1	0	0	0	0	153
11:00	1	84	50	2	23	1	1	6	9	0	0	0	0	0	177
12 PM	0	71	46	3	13	4	1	5	8	1	0	0	0	0	152
13:00	2	75	50	1	22	1	1	7	3	0	0	0	0	0	162
14:00	2	98	60	1	21	1	1	5	13	1	0	0	0	0	203
15:00	0	120	75	5	28	2	0	6	15	1	0	0	0	0	252
16:00	0	144	78	2	30	3	0	4	9	0	0	0	0	0	270
17:00	0	203	96	0	36	1	0	5	6	0	0	0	0	0	347
18:00	0	200	83	1	35	0	0	15	7	0	0	0	1	0	342
19:00	1	119	61	2	23	1	0	7	8	0	0	0	0	0	222
20:00	0	124	41	0	8	0	0	3	7	0	0	0	0	0	183
21:00	0	72	43	1	13	0	0	2	3	0	0	0	0	0	134
22:00	0	53	26	1	10	0	0	2	4	0	0	0	0	0	96
23:00	1	27	15	0	4	0	0	2	4	0	0	0	0	0	53
Total	12	1964	1043	33	444	21	4	99	171	8	0	0	2	0	3801
Percent	0.3%	51.7%	27.4%	0.9%	11.7%	0.6%	0.1%	2.6%	4.5%	0.2%	0.0%	0.0%	0.1%	0.0%	
AM Peak	07:00	07:00	07:00	09:00	07:00	08:00	11:00	09:00	10:00	07:00			07:00		
Vol.	2	164	79	5	53	3	1	13	13	2			1		
PM Peak	13:00	17:00	17:00	15:00	17:00	12:00	12:00	18:00	15:00	12:00			18:00		
Vol.	2	203	96	5	36	4	1	15	15	1			1		

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 1
Station ID:
SH 4 S. of Fox Rd.

Date Start: 24-Apr-19
Date End: 29-Apr-19

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/26/19	0	23	10	0	5	0	0	0	2	0	0	0	0	0	40
01:00	0	7	5	0	1	0	0	1	4	0	0	0	0	0	18
02:00	0	6	3	0	1	0	0	0	1	0	0	0	0	0	11
03:00	0	4	4	0	0	0	0	0	3	0	0	0	0	0	11
04:00	0	7	8	1	4	0	0	0	3	0	0	0	0	0	23
05:00	0	20	14	0	6	1	0	1	5	0	0	0	0	0	47
06:00	0	52	59	2	37	0	0	2	12	0	0	0	0	0	164
07:00	3	132	87	2	40	0	0	6	16	1	0	0	0	0	287
08:00	0	115	77	5	29	2	0	7	18	1	0	0	0	0	254
09:00	0	84	43	4	19	2	0	8	19	0	0	0	1	0	180
10:00	1	68	36	2	14	1	0	9	9	0	0	0	0	0	140
11:00	3	78	35	3	13	2	0	6	14	2	0	0	0	0	156
12 PM	1	87	61	2	22	2	0	7	6	0	0	0	0	0	188
13:00	1	96	58	0	15	4	0	7	4	0	0	0	0	0	185
14:00	4	116	63	7	27	2	0	15	6	1	0	0	0	0	241
15:00	1	133	69	2	18	0	0	4	6	1	0	0	0	0	234
16:00	2	178	92	5	44	2	0	13	6	0	0	0	0	0	342
17:00	0	216	85	2	37	2	0	8	11	0	0	0	0	0	361
18:00	1	179	84	0	35	1	0	6	6	0	0	0	1	0	313
19:00	0	126	69	2	16	1	0	7	9	0	0	0	0	0	230
20:00	0	90	40	1	18	0	0	3	8	1	0	0	0	0	161
21:00	0	96	43	2	8	0	0	6	2	0	0	0	0	0	157
22:00	1	69	31	2	9	0	0	3	4	0	0	0	0	0	119
23:00	0	43	24	0	6	0	0	0	3	0	0	0	0	0	76
Total	18	2025	1100	44	424	22	0	119	177	7	0	0	2	0	3938
Percent	0.5%	51.4%	27.9%	1.1%	10.8%	0.6%	0.0%	3.0%	4.5%	0.2%	0.0%	0.0%	0.1%	0.0%	
AM Peak	07:00	07:00	07:00	08:00	07:00	08:00		10:00	09:00	11:00			09:00		
Vol.	3	132	87	5	40	2		9	19	2			1		
PM Peak	14:00	17:00	16:00	14:00	16:00	13:00		14:00	17:00	14:00			18:00		
Vol.	4	216	92	7	44	4		15	11	1			1		

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 1
Station ID:
SH 4 S. of Fox Rd.

Date Start: 24-Apr-19
Date End: 29-Apr-19

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/27/19	0	37	17	0	4	0	0	4	1	0	0	0	0	0	63
01:00	0	20	8	1	3	0	0	0	5	0	0	0	0	0	37
02:00	0	11	6	0	0	0	0	0	2	0	0	0	0	0	19
03:00	3	9	3	0	1	0	0	0	4	0	0	0	0	0	20
04:00	0	14	6	0	2	0	0	0	2	0	0	0	0	0	24
05:00	0	11	12	1	11	0	0	0	1	0	0	0	0	0	36
06:00	0	19	23	1	12	0	0	3	8	1	0	0	0	0	67
07:00	1	39	26	1	15	1	0	6	4	0	0	0	0	0	93
08:00	0	55	37	1	17	2	0	2	10	1	0	0	0	0	125
09:00	0	88	48	7	11	0	0	2	12	1	0	0	0	0	169
10:00	4	94	50	3	15	0	0	4	6	0	0	0	0	0	176
11:00	2	134	73	2	15	1	0	4	9	0	0	0	0	0	240
12 PM	0	143	66	2	13	0	0	8	9	1	0	0	0	0	242
13:00	0	118	55	1	20	5	0	3	10	1	0	0	0	0	213
14:00	2	125	61	1	17	2	0	2	7	0	0	0	0	0	217
15:00	0	131	76	0	26	1	0	9	2	0	0	0	0	0	245
16:00	2	132	56	0	15	0	0	6	2	0	0	0	0	0	213
17:00	7	129	67	3	29	0	0	7	5	0	0	0	1	0	248
18:00	1	164	56	1	19	0	0	8	6	0	0	0	0	0	255
19:00	3	107	53	2	16	0	0	7	5	0	0	0	0	0	193
20:00	0	101	51	1	13	0	0	8	3	0	0	0	0	0	177
21:00	2	96	62	0	14	1	0	8	6	1	0	0	0	0	190
22:00	0	78	36	1	12	0	0	2	2	0	0	0	0	0	131
23:00	2	64	21	0	5	0	0	1	2	0	0	0	0	0	95
Total	29	1919	969	29	305	13	0	94	123	6	0	0	1	0	3488
Percent	0.8%	55.0%	27.8%	0.8%	8.7%	0.4%	0.0%	2.7%	3.5%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	11:00	09:00	08:00	08:00		07:00	09:00	06:00					
Vol.	4	134	73	7	17	2		6	12	1					
PM Peak	17:00	18:00	15:00	17:00	17:00	13:00		15:00	13:00	12:00			17:00		
Vol.	7	164	76	3	29	5		9	10	1			1		

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 1
Station ID:
SH 4 S. of Fox Rd.

Date Start: 24-Apr-19
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NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/28/19	0	41	23	1	6	0	0	1	3	0	0	0	0	0	75
01:00	0	39	22	0	2	0	0	4	3	0	0	0	0	0	70
02:00	0	10	9	0	2	0	0	0	1	0	0	0	0	0	22
03:00	0	8	6	0	1	0	0	2	2	0	0	0	0	0	19
04:00	0	12	4	0	2	0	0	0	3	0	0	0	0	0	21
05:00	0	10	4	1	3	0	0	0	0	0	0	0	0	0	18
06:00	0	9	9	0	10	0	0	1	4	0	0	0	0	0	33
07:00	0	16	17	0	4	0	0	1	3	0	0	0	0	0	41
08:00	0	39	15	0	5	0	0	2	5	0	0	0	0	0	66
09:00	0	50	25	0	12	0	0	1	10	1	0	0	0	0	99
10:00	2	72	34	0	10	0	0	2	6	0	0	0	0	0	126
11:00	2	70	41	0	16	0	0	8	4	0	0	0	0	0	141
12 PM	0	118	61	1	16	0	0	5	3	0	0	0	0	0	204
13:00	2	134	77	0	11	0	0	7	7	0	0	0	0	0	238
14:00	3	139	68	1	12	0	0	9	1	0	0	0	0	0	233
15:00	4	137	88	1	24	0	0	10	1	0	0	0	0	0	265
16:00	0	132	94	3	18	1	0	6	6	0	0	0	0	0	260
17:00	3	165	65	1	21	0	0	5	1	0	0	0	0	0	261
18:00	8	166	58	1	31	1	0	10	3	0	0	0	0	0	278
19:00	3	114	60	1	17	0	0	6	3	0	0	0	0	0	204
20:00	1	112	46	1	12	1	0	4	5	0	0	0	0	0	182
21:00	0	71	35	0	10	1	0	2	4	0	0	0	0	0	123
22:00	0	60	24	1	9	0	0	1	4	0	0	0	0	0	99
23:00	0	28	20	0	7	0	0	2	3	0	0	0	0	0	60
Total	28	1752	905	13	261	4	0	89	85	1	0	0	0	0	3138
Percent	0.9%	55.8%	28.8%	0.4%	8.3%	0.1%	0.0%	2.8%	2.7%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	10:00	11:00	00:00	11:00			11:00	09:00	09:00					
Vol.	2	72	41	1	16			8	10	1					
PM Peak	18:00	18:00	16:00	16:00	18:00	16:00		15:00	13:00						
Vol.	8	166	94	3	31	1		10	7						

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 1
Station ID:
SH 4 S. of Fox Rd.

Date Start: 24-Apr-19
Date End: 29-Apr-19

NB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/29/19	2	19	10	1	5	0	0	2	2	0	0	0	0	0	41
01:00	0	12	5	0	2	0	0	1	1	0	0	0	0	0	21
02:00	0	7	3	0	0	0	0	0	3	0	0	0	0	0	13
03:00	0	7	3	1	1	0	0	0	3	0	0	0	0	0	15
04:00	0	9	5	0	2	0	0	0	4	0	0	0	0	0	20
05:00	0	19	15	1	10	1	0	0	6	0	0	0	0	0	52
06:00	1	76	62	4	40	0	0	4	13	0	0	0	0	0	200
07:00	2	165	95	2	66	2	0	7	15	1	0	0	0	0	355
08:00	0	131	68	2	36	5	0	5	16	2	0	0	0	0	265
09:00	0	81	64	4	20	3	0	7	20	0	0	0	0	0	199
10:00	3	74	40	0	17	2	0	12	14	1	0	0	0	0	163
11:00	0	12	7	0	2	1	0	2	0	0	0	0	0	0	24
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	8	612	377	15	201	14	0	40	97	4	0	0	0	0	1368
Percent	0.6%	44.7%	27.6%	1.1%	14.7%	1.0%	0.0%	2.9%	7.1%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	07:00	06:00	07:00	08:00		10:00	09:00	08:00					
Vol.	3	165	95	4	66	5		12	20	2					
PM Peak Vol.															
Grand Total	96	9309	4979	145	1857	85	4	492	708	27	0	0	5	0	17707
Percent	0.5%	52.6%	28.1%	0.8%	10.5%	0.5%	0.0%	2.8%	4.0%	0.2%	0.0%	0.0%	0.0%	0.0%	

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 1
Station ID:
SH 4 S. of Fox St.

Date Start: 24-Apr-19
Date End: 29-Apr-19

NB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 95	96 999	Total	Pace Speed	Number in Pace
04/24/19	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	**3**	0	2	7	27	35	64	25	1	0	0	0	0	0	164	56-65	99
14:00	0	0	1	5	13	45	65	37	6	0	0	0	0	0	172	56-65	110
15:00	0	0	1	6	18	60	93	43	7	0	0	0	0	0	228	56-65	153
16:00	0	0	3	7	20	72	96	54	5	1	**1**	0	0	0	259	56-65	168
17:00	0	0	**4**	**12**	**28**	**86**	134	**63**	**9**	1	0	0	0	0	**337**	56-65	220
18:00	0	**1**	1	5	28	69	**138**	55	6	**6**	0	0	0	0	309	56-65	207
19:00	1	0	0	1	9	49	66	49	1	0	0	0	0	0	176	61-70	115
20:00	0	0	0	3	10	32	48	31	6	1	0	0	0	0	131	56-65	80
21:00	0	0	0	4	13	24	44	21	6	0	0	0	0	0	112	56-65	68
22:00	0	0	1	0	6	8	22	12	1	0	0	0	0	0	50	61-70	34
23:00	0	0	1	0	4	6	17	8	0	0	0	0	0	0	36	61-70	25
Total	4	1	14	50	176	486	787	398	48	9	1	0	0	0	1974		
Percent	0.2%	0.1%	0.7%	2.5%	8.9%	24.6%	39.9%	20.2%	2.4%	0.5%	0.1%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.	13:00 3	18:00 1	17:00 4	17:00 12	17:00 28	17:00 86	18:00 138	17:00 63	17:00 9	18:00 6	16:00 1				17:00 337		

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 1
Station ID:
SH 4 S. of Fox St.

Date Start: 24-Apr-19
Date End: 29-Apr-19

NB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 95	96 999	Total	Pace Speed	Number in Pace
04/25/19	0	0	0	0	0	3	9	6	1	0	0	0	0	0	19	61-70	15
01:00	0	0	0	0	2	8	9	3	1	**1**	0	0	0	0	24	56-65	17
02:00	0	0	0	0	3	4	7	2	0	0	0	0	0	0	16	56-65	11
03:00	0	0	0	0	0	1	10	3	1	0	0	0	0	0	15	61-70	13
04:00	0	0	0	0	0	3	10	7	2	1	0	0	0	0	23	61-70	17
05:00	0	0	**1**	0	2	9	31	9	1	1	**1**	0	0	0	55	56-65	40
06:00	0	0	0	1	7	38	65	36	**9**	1	0	0	0	0	157	56-65	103
07:00	0	0	0	4	19	**70**	**160**	**62**	3	0	0	0	0	0	**318**	56-65	230
08:00	0	0	1	4	**29**	58	121	34	6	0	0	0	0	0	253	56-65	179
09:00	0	0	0	**6**	25	42	74	22	6	0	0	0	0	0	175	56-65	116
10:00	0	0	1	5	14	37	63	27	5	1	0	0	0	0	153	56-65	100
11:00	**1**	0	1	2	18	50	67	34	4	0	0	0	0	0	177	56-65	117
12 PM	0	1	2	8	20	34	62	21	4	0	0	0	0	0	152	56-65	96
13:00	0	0	2	9	21	40	60	24	**6**	0	0	0	0	0	162	56-65	100
14:00	0	0	0	6	17	56	89	29	6	0	0	0	0	0	203	56-65	145
15:00	**2**	0	0	7	30	78	107	27	1	0	0	0	0	0	252	56-65	185
16:00	0	0	2	3	33	64	125	40	3	0	0	0	0	0	270	56-65	189
17:00	0	0	3	2	41	**114**	126	**55**	6	0	0	0	0	0	**347**	56-65	240
18:00	0	0	2	**21**	**42**	85	**136**	53	2	0	**1**	0	0	0	342	56-65	221
19:00	2	0	1	4	16	68	88	37	5	**1**	0	0	0	0	222	56-65	156
20:00	0	0	5	3	16	62	75	20	2	0	0	0	0	0	183	56-65	137
21:00	0	**2**	**6**	7	24	36	44	12	3	0	0	0	0	0	134	56-65	80
22:00	0	0	0	2	15	21	40	16	2	0	0	0	0	0	96	56-65	61
23:00	0	0	1	0	4	12	21	13	2	0	0	0	0	0	53	59-68	34
Total	5	3	28	94	398	993	1599	592	81	6	2	0	0	0	3801		
Percent	0.1%	0.1%	0.7%	2.5%	10.5%	26.1%	42.1%	15.6%	2.1%	0.2%	0.1%	0.0%	0.0%	0.0%			
AM Peak	11:00		05:00	09:00	08:00	07:00	07:00	07:00	06:00	01:00	05:00				07:00		
Vol.	1		1	6	29	70	160	62	9	1	1				318		
PM Peak	15:00	21:00	21:00	18:00	18:00	17:00	18:00	17:00	13:00	19:00	18:00				17:00		
Vol.	2	2	6	21	42	114	136	55	6	1	1				347		

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 1
Station ID:
SH 4 S. of Fox St.

Date Start: 24-Apr-19
Date End: 29-Apr-19

NB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 95	96 999	Total	Pace Speed	Number in Pace
04/26/19	0	**2**	1	0	1	10	19	5	1	1	0	0	0	0	40	56-65	29
01:00	0	0	0	0	0	1	11	4	2	0	0	0	0	0	18	61-70	15
02:00	0	0	0	0	0	3	3	4	1	0	0	0	0	0	11	61-70	7
03:00	0	0	0	0	1	5	3	2	0	0	0	0	0	0	11	55-64	8
04:00	0	0	0	2	0	3	13	2	3	0	0	0	0	0	23	56-65	16
05:00	0	0	0	2	5	4	18	13	3	2	0	0	0	0	47	61-70	31
06:00	0	0	**3**	2	7	39	68	39	5	1	0	0	0	0	164	61-70	107
07:00	0	0	0	4	20	**85**	**130**	41	**7**	0	0	0	0	0	**287**	56-65	215
08:00	0	0	0	5	**22**	65	111	**46**	5	0	0	0	0	0	254	56-65	176
09:00	0	0	2	**7**	19	46	71	26	7	1	**1**	0	0	0	180	56-65	117
10:00	0	0	0	4	14	21	58	37	3	**3**	0	0	0	0	140	61-70	95
11:00	**1**	0	1	2	20	45	51	26	7	2	1	0	0	0	156	56-65	96
12 PM	0	0	2	4	20	47	66	42	6	1	0	0	0	0	188	56-65	113
13:00	0	0	0	3	17	42	89	30	3	1	0	0	0	0	185	56-65	131
14:00	**3**	0	0	2	26	63	92	46	6	2	**1**	0	0	0	241	56-65	155
15:00	0	0	2	4	10	59	91	56	12	0	0	0	0	0	234	56-65	150
16:00	0	0	0	**10**	**32**	**85**	134	71	8	1	1	0	0	0	342	56-65	219
17:00	0	0	3	5	24	85	**159**	**79**	6	0	0	0	0	0	**361**	56-65	244
18:00	0	0	**5**	4	24	58	129	79	10	**4**	0	0	0	0	313	61-70	208
19:00	1	0	1	4	12	29	110	56	**15**	2	0	0	0	0	230	61-70	166
20:00	0	0	0	4	8	42	65	30	10	2	0	0	0	0	161	56-65	107
21:00	1	0	0	3	15	22	62	44	10	0	0	0	0	0	157	61-70	106
22:00	0	**1**	0	1	7	32	44	32	2	0	0	0	0	0	119	56-65	76
23:00	0	0	0	3	2	11	40	14	6	0	0	0	0	0	76	61-70	54
Total	6	3	20	75	306	902	1637	824	138	23	4	0	0	0	3938		
Percent	0.2%	0.1%	0.5%	1.9%	7.8%	22.9%	41.6%	20.9%	3.5%	0.6%	0.1%	0.0%	0.0%	0.0%			
AM Peak	11:00	00:00	06:00	09:00	08:00	07:00	07:00	08:00	07:00	10:00	09:00				07:00		
Vol.	1	2	3	7	22	85	130	46	7	3	1				287		
PM Peak	14:00	22:00	18:00	16:00	16:00	16:00	17:00	17:00	19:00	18:00	14:00				17:00		
Vol.	3	1	5	10	32	85	159	79	15	4	1				361		

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 1
Station ID:
SH 4 S. of Fox St.

Date Start: 24-Apr-19
Date End: 29-Apr-19

NB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 95	96 999	Total	Pace Speed	Number in Pace
04/27/19	0	0	0	4	7	10	22	17	2	1	0	0	0	0	63	61-70	39
01:00	0	0	0	1	1	5	17	11	1	1	0	0	0	0	37	61-70	28
02:00	0	0	0	0	1	2	5	6	4	1	0	0	0	0	19	61-70	11
03:00	**1**	0	0	1	0	2	4	8	4	0	0	0	0	0	20	66-75	12
04:00	0	0	0	0	0	2	12	6	3	1	0	0	0	0	24	61-70	18
05:00	0	0	0	1	3	2	10	14	3	**2**	**1**	0	0	0	36	61-70	24
06:00	0	0	1	0	5	13	25	16	5	1	1	0	0	0	67	61-70	41
07:00	0	0	0	2	4	19	30	26	10	1	1	0	0	0	93	61-70	56
08:00	0	0	1	2	12	19	47	32	**11**	1	0	0	0	0	125	61-70	79
09:00	0	0	0	4	10	38	71	**37**	9	0	0	0	0	0	169	56-65	109
10:00	0	0	1	7	10	34	76	36	9	2	0	0	**1**	0	176	61-70	112
11:00	0	0	**3**	**10**	**26**	**62**	**105**	29	5	0	0	0	0	0	**240**	56-65	167
12 PM	**2**	1	2	2	17	57	113	40	**8**	0	0	0	0	0	242	56-65	170
13:00	0	0	3	10	**28**	46	83	37	5	1	0	0	0	0	213	56-65	129
14:00	0	0	1	4	12	56	92	46	5	0	**1**	0	0	0	217	56-65	148
15:00	0	0	3	8	23	47	**116**	45	3	0	0	0	0	0	245	56-65	163
16:00	1	0	0	4	26	43	87	47	3	**2**	0	0	0	0	213	61-70	134
17:00	0	0	0	**14**	26	**73**	81	49	4	1	0	0	0	0	248	56-65	154
18:00	0	0	3	8	17	63	106	**51**	7	0	0	0	0	0	**255**	56-65	169
19:00	0	**3**	2	5	11	45	83	37	5	1	1	0	0	0	193	56-65	128
20:00	0	1	1	2	20	47	77	25	3	1	0	0	0	0	177	56-65	124
21:00	1	0	3	13	16	52	69	30	5	1	0	0	0	0	190	56-65	121
22:00	1	0	1	0	17	41	48	21	2	0	0	0	0	0	131	56-65	89
23:00	0	0	**5**	5	7	27	33	17	0	1	0	0	0	0	95	56-65	60
Total	6	5	30	107	299	805	1412	683	116	19	5	0	1	0	3488		
Percent	0.2%	0.1%	0.9%	3.1%	8.6%	23.1%	40.5%	19.6%	3.3%	0.5%	0.1%	0.0%	0.0%	0.0%			
AM Peak	03:00		11:00	11:00	11:00	11:00	11:00	09:00	08:00	05:00	05:00		10:00		11:00		
Vol.	1		3	10	26	62	105	37	11	2	1		1		240		
PM Peak	12:00	19:00	23:00	17:00	13:00	17:00	15:00	18:00	12:00	16:00	14:00				18:00		
Vol.	2	3	5	14	28	73	116	51	8	2	1				255		

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 1
Station ID:
SH 4 S. of Fox St.

Date Start: 24-Apr-19
Date End: 29-Apr-19

NB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 95	96 999	Total	Pace Speed	Number in Pace
04/28/19	0	0	0	2	0	20	34	18	1	0	0	0	0	0	75	56-65	54
01:00	0	0	0	2	10	12	26	19	1	0	0	0	0	0	70	61-70	45
02:00	0	0	0	0	3	6	9	4	0	0	0	0	0	0	22	56-65	15
03:00	0	0	0	0	2	2	11	3	1	0	0	0	0	0	19	59-68	14
04:00	0	0	0	2	4	1	9	4	1	0	0	0	0	0	21	61-70	13
05:00	0	0	0	0	2	1	6	7	2	0	0	0	0	0	18	61-70	13
06:00	0	0	0	1	2	9	10	10	1	0	0	0	0	0	33	59-68	20
07:00	0	**1**	0	0	1	8	22	5	4	0	0	0	0	0	41	56-65	30
08:00	0	0	**1**	1	8	16	28	7	4	**1**	0	0	0	0	66	56-65	44
09:00	0	0	1	2	9	28	40	18	1	0	0	0	0	0	99	56-65	68
10:00	0	0	0	4	7	21	**55**	**36**	2	1	0	0	0	0	126	61-70	91
11:00	**1**	0	0	**13**	**18**	**30**	53	21	**5**	0	0	0	0	0	**141**	56-65	83
12 PM	0	0	1	3	16	47	90	34	11	2	0	0	0	0	204	56-65	137
13:00	**1**	0	0	6	18	48	105	49	6	5	0	0	0	0	238	61-70	154
14:00	1	0	0	4	12	53	90	55	14	4	0	0	0	0	233	60-69	145
15:00	0	0	2	4	**23**	**56**	112	57	7	4	0	0	0	0	265	61-70	169
16:00	0	0	1	**7**	21	47	100	68	16	0	0	0	0	0	260	61-70	168
17:00	0	0	0	2	10	56	**114**	53	**23**	2	1	0	0	0	261	56-65	170
18:00	1	0	**3**	1	19	55	111	**75**	12	1	0	0	0	0	**278**	61-70	186
19:00	1	**3**	0	0	12	31	76	59	16	**6**	0	0	0	0	204	61-70	135
20:00	0	0	1	4	13	34	72	48	8	1	1	0	0	0	182	61-70	120
21:00	0	0	1	3	14	16	39	37	11	2	0	0	0	0	123	61-70	76
22:00	0	0	0	3	12	17	28	31	6	2	0	0	0	0	99	61-70	59
23:00	0	0	0	0	1	10	24	17	6	0	**2**	0	0	0	60	61-70	41
Total	5	4	11	64	237	624	1264	735	159	31	4	0	0	0	3138		
Percent	0.2%	0.1%	0.4%	2.0%	7.6%	19.9%	40.3%	23.4%	5.1%	1.0%	0.1%	0.0%	0.0%	0.0%			
AM Peak	11:00	07:00	08:00	11:00	11:00	11:00	10:00	10:00	11:00	08:00					11:00		
Vol.	1	1	1	13	18	30	55	36	5	1					141		
PM Peak	13:00	19:00	18:00	16:00	15:00	15:00	17:00	18:00	17:00	19:00	23:00				18:00		
Vol.	1	3	3	7	23	56	114	75	23	6	2				278		

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 1
Station ID:
SH 4 S. of Fox St.

Date Start: 24-Apr-19
Date End: 29-Apr-19

NB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 95	96 999	Total	Pace Speed	Number in Pace
04/29/19	2	0	0	2	3	5	13	12	3	1	0	0	0	0	41	61-70	25
01:00	0	0	0	0	3	2	7	5	3	0	**1**	0	0	0	21	61-70	12
02:00	0	0	1	1	0	1	6	3	1	0	0	0	0	0	13	60-69	9
03:00	0	0	0	0	0	1	8	4	0	1	1	0	0	0	15	61-70	12
04:00	0	0	0	0	1	3	7	5	2	1	1	0	0	0	20	60-69	12
05:00	0	0	0	0	0	9	16	21	4	2	0	0	0	0	52	61-70	37
06:00	0	0	0	0	7	29	77	61	**21**	**3**	1	0	**1**	0	200	61-70	138
07:00	0	0	2	2	**37**	67	**153**	**81**	11	2	0	0	0	0	**355**	61-70	234
08:00	0	0	1	3	17	**68**	124	41	9	2	0	0	0	0	265	56-65	192
09:00	1	**1**	0	**7**	28	36	75	42	7	2	0	0	0	0	199	61-70	117
10:00	0	0	**3**	0	11	27	70	38	14	0	0	0	0	0	163	61-70	108
11:00	**4**	0	1	0	2	5	8	4	0	0	0	0	0	0	24	56-65	13
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	7	1	8	15	109	253	564	317	75	14	4	0	1	0	1368		
Percent	0.5%	0.1%	0.6%	1.1%	8.0%	18.5%	41.2%	23.2%	5.5%	1.0%	0.3%	0.0%	0.1%	0.0%			
AM Peak	11:00	09:00	10:00	09:00	07:00	08:00	07:00	07:00	06:00	06:00	01:00		06:00		07:00		
Vol.	4	1	3	7	37	68	153	81	21	3	1		1		355		
PM Peak Vol.																	
Total	33	17	111	405	1525	4063	7263	3549	617	102	20	0	2	0	17707		
Percent	0.2%	0.1%	0.6%	2.3%	8.6%	22.9%	41.0%	20.0%	3.5%	0.6%	0.1%	0.0%	0.0%	0.0%			

	15th Percentile :	55 MPH
	50th Percentile :	61 MPH
	85th Percentile :	67 MPH
	95th Percentile :	69 MPH
Stats	10 MPH Pace Speed :	56-65 MPH
	Number in Pace :	11326
	Percent in Pace :	64.0%
	Number of Vehicles > 55 MPH :	15616
	Percent of Vehicles > 55 MPH :	88.2%
	Mean Speed(Average) :	62 MPH

SH 4 Vol/Class/Speed Data (Southbound)

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 2
Station ID:
SH 4 N. of Fox Rd.

Date Start: 24-Apr-19
Date End: 29-Apr-19

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/24/19	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	0	107	71	6	27	1	0	7	9	0	0	0	0	0	228
15:00	1	154	90	0	49	0	0	7	7	0	0	0	0	0	308
16:00	0	222	144	2	59	3	0	7	3	0	0	0	0	0	440
17:00	0	235	158	1	67	2	1	10	3	2	0	0	0	0	479
18:00	1	175	117	4	39	0	1	3	4	0	0	0	0	0	344
19:00	0	94	69	5	29	0	0	5	8	0	0	0	1	0	211
20:00	0	99	53	0	22	0	0	3	9	0	0	0	0	0	186
21:00	0	73	40	1	7	0	0	1	2	0	0	0	0	0	124
22:00	0	32	15	2	8	0	0	0	5	0	0	0	0	0	62
23:00	0	16	4	0	3	0	0	1	2	0	0	0	0	0	26
Total	2	1207	761	21	310	6	2	44	52	2	0	0	1	0	2408
Percent	0.1%	50.1%	31.6%	0.9%	12.9%	0.2%	0.1%	1.8%	2.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak Vol.															
PM Peak	15:00	17:00	17:00	14:00	17:00	16:00	17:00	17:00	14:00	17:00			19:00		
Vol.	1	235	158	6	67	3	1	10	9	2			1		

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 2
Station ID:
SH 4 N. of Fox Rd.

Date Start: 24-Apr-19
Date End: 29-Apr-19

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/25/19	0	10	6	0	3	0	0	0	1	0	0	0	0	0	20
01:00	0	4	2	3	2	0	0	0	3	0	0	0	0	0	14
02:00	0	4	4	9	2	0	0	1	2	0	0	0	0	0	22
03:00	0	3	6	0	3	0	0	0	4	0	0	0	0	0	16
04:00	0	8	14	3	10	0	0	1	3	0	0	0	0	0	39
05:00	0	39	30	1	26	0	0	1	6	0	0	0	0	0	103
06:00	0	78	73	7	37	2	0	7	8	0	0	0	0	0	212
07:00	0	205	96	8	49	0	0	13	12	2	0	0	0	0	385
08:00	0	145	107	4	46	0	0	18	13	0	0	0	0	0	333
09:00	1	94	77	6	31	1	0	11	10	1	0	0	0	0	232
10:00	3	85	59	7	35	1	0	15	11	0	0	0	0	0	216
11:00	1	92	65	3	27	1	0	6	10	0	0	0	0	0	205
12 PM	0	87	72	2	26	0	0	6	11	0	0	0	0	0	204
13:00	0	110	73	2	34	3	0	4	2	1	0	0	0	0	229
14:00	2	112	75	7	40	0	0	5	5	0	0	0	0	0	246
15:00	1	188	112	5	49	1	0	6	7	0	0	0	0	0	369
16:00	2	218	135	5	57	2	0	11	9	0	0	0	0	0	439
17:00	2	274	186	6	75	0	0	6	11	0	0	0	0	0	560
18:00	2	214	134	2	36	0	0	9	4	0	0	0	0	0	401
19:00	1	110	78	2	18	0	0	4	4	0	0	0	0	0	217
20:00	1	137	59	7	24	0	0	5	10	0	0	0	1	0	244
21:00	1	82	47	2	14	0	0	4	3	0	0	0	0	0	153
22:00	0	42	20	1	1	0	0	2	2	0	0	0	0	0	68
23:00	1	21	7	2	5	0	0	2	2	0	0	0	0	0	40
Total	18	2362	1537	94	650	11	0	137	153	4	0	0	1	0	4967
Percent	0.4%	47.6%	30.9%	1.9%	13.1%	0.2%	0.0%	2.8%	3.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	08:00	02:00	07:00	06:00		08:00	08:00	07:00					
Vol.	3	205	107	9	49	2		18	13	2					
PM Peak	14:00	17:00	17:00	14:00	17:00	13:00		16:00	12:00	13:00			20:00		
Vol.	2	274	186	7	75	3		11	11	1			1		

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 2
Station ID:
SH 4 N. of Fox Rd.

Date Start: 24-Apr-19
Date End: 29-Apr-19

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/26/19	0	15	7	0	2	1	0	0	3	0	0	0	0	0	28
01:00	0	6	2	1	2	0	0	1	5	0	0	0	0	0	17
02:00	0	4	3	1	0	0	0	0	3	0	0	0	0	0	11
03:00	0	3	6	4	0	0	0	1	3	0	0	0	0	0	17
04:00	0	13	12	2	12	0	0	0	3	1	0	0	0	0	43
05:00	0	26	29	6	23	1	0	1	5	0	0	0	0	0	91
06:00	0	64	51	1	27	2	0	2	6	0	0	0	0	0	153
07:00	0	144	73	5	29	0	0	8	9	0	0	0	0	0	268
08:00	0	126	70	4	52	1	0	9	15	3	0	0	0	0	280
09:00	2	102	59	4	38	6	0	8	12	2	0	0	0	0	233
10:00	1	95	70	5	38	3	0	11	4	1	0	0	0	0	228
11:00	0	124	79	4	42	1	0	7	9	1	0	0	0	0	267
12 PM	0	138	79	5	37	3	0	7	8	0	0	0	0	0	277
13:00	0	138	76	4	36	2	0	13	8	0	0	0	0	0	277
14:00	1	154	96	2	34	0	0	10	5	0	0	0	0	0	302
15:00	1	186	111	3	51	1	0	20	8	0	0	0	0	0	381
16:00	2	268	171	3	66	2	0	13	7	1	0	0	0	0	533
17:00	3	318	186	6	87	1	0	26	7	0	0	0	0	0	634
18:00	3	233	155	2	52	1	0	6	4	1	0	0	0	0	457
19:00	3	130	82	1	24	1	0	4	9	0	0	0	0	0	254
20:00	3	94	63	6	19	0	0	2	9	0	0	0	0	0	196
21:00	0	104	38	2	15	0	0	3	2	0	0	0	0	0	164
22:00	1	73	39	6	6	0	0	1	3	1	0	0	0	0	130
23:00	0	29	14	2	9	0	0	1	3	0	0	0	0	0	58
Total	20	2587	1571	79	701	26	0	154	150	11	0	0	0	0	5299
Percent	0.4%	48.8%	29.6%	1.5%	13.2%	0.5%	0.0%	2.9%	2.8%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	11:00	05:00	08:00	09:00		10:00	08:00	08:00					
Vol.	2	144	79	6	52	6		11	15	3					
PM Peak	17:00	17:00	17:00	17:00	17:00	12:00		17:00	19:00	16:00					
Vol.	3	318	186	6	87	3		26	9	1					

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 2
Station ID:
SH 4 N. of Fox Rd.

Date Start: 24-Apr-19
Date End: 29-Apr-19

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/27/19	0	20	16	0	0	0	0	2	5	0	0	0	0	0	43
01:00	0	15	8	1	3	0	0	0	1	0	0	0	0	0	28
02:00	0	8	5	3	2	0	0	0	5	0	0	0	0	0	23
03:00	0	8	2	1	4	0	0	1	2	0	0	0	0	0	18
04:00	0	6	5	2	11	0	0	1	1	0	0	0	0	0	26
05:00	0	18	11	2	18	0	0	3	2	0	0	0	0	0	54
06:00	0	44	42	0	15	0	0	8	3	0	0	0	0	0	112
07:00	0	69	68	0	24	0	0	5	7	0	0	0	1	0	174
08:00	6	98	62	2	24	1	0	16	7	4	0	0	0	0	220
09:00	0	146	74	3	37	1	0	9	4	0	0	0	0	0	274
10:00	4	142	77	3	20	0	0	13	6	1	0	0	0	0	266
11:00	3	145	80	1	22	1	0	4	2	2	0	0	0	0	260
12 PM	3	156	86	0	20	0	0	13	4	0	0	0	0	0	282
13:00	2	152	94	4	21	3	0	12	1	3	0	0	0	0	292
14:00	4	147	89	2	28	0	0	7	3	0	0	0	0	0	280
15:00	1	164	92	3	28	2	0	6	6	1	0	0	0	0	303
16:00	3	178	101	1	31	1	0	8	6	0	0	0	0	0	329
17:00	2	185	85	2	27	1	0	5	1	1	0	0	0	0	309
18:00	3	134	81	1	22	0	0	5	1	0	0	0	0	0	247
19:00	4	104	54	4	18	0	0	3	9	0	0	0	0	0	196
20:00	5	90	49	1	13	0	0	3	11	0	0	0	0	0	172
21:00	0	89	41	0	13	0	0	5	3	0	0	0	0	0	151
22:00	0	72	26	0	9	0	0	0	1	0	0	0	0	0	108
23:00	1	32	18	0	5	0	0	1	4	0	0	0	0	0	61
Total	41	2222	1266	36	415	10	0	130	95	12	0	0	1	0	4228
Percent	1.0%	52.6%	29.9%	0.9%	9.8%	0.2%	0.0%	3.1%	2.2%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	09:00	11:00	02:00	09:00	08:00		08:00	07:00	08:00			07:00		
Vol.	6	146	80	3	37	1		16	7	4			1		
PM Peak	20:00	17:00	16:00	13:00	16:00	13:00		12:00	20:00	13:00					
Vol.	5	185	101	4	31	3		13	11	3					

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 2
Station ID:
SH 4 N. of Fox Rd.

Date Start: 24-Apr-19
Date End: 29-Apr-19

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/28/19	1	14	10	0	1	0	0	0	7	0	0	0	0	0	33
01:00	1	10	7	1	4	0	0	1	0	0	0	0	0	0	24
02:00	0	3	2	0	2	0	0	0	3	0	0	0	0	0	10
03:00	0	7	1	0	4	0	0	3	1	0	0	0	0	0	16
04:00	0	5	2	0	10	0	0	1	2	0	0	0	0	0	20
05:00	0	9	17	0	18	0	0	0	2	0	0	0	0	0	46
06:00	0	29	29	0	6	0	0	0	4	0	0	0	0	0	68
07:00	1	41	35	4	15	2	0	2	2	1	0	0	0	0	103
08:00	1	66	44	0	16	0	0	4	1	0	0	0	0	0	132
09:00	1	112	60	1	26	1	0	2	2	0	0	0	0	0	205
10:00	0	112	57	2	11	0	0	9	4	0	0	0	0	0	195
11:00	3	130	60	0	22	0	0	6	4	0	0	0	0	0	225
12 PM	3	163	73	2	24	0	0	4	3	0	0	0	0	0	272
13:00	3	180	99	1	20	2	0	8	7	0	0	0	0	0	320
14:00	8	147	83	4	35	5	0	3	3	1	0	0	0	0	289
15:00	2	126	76	1	29	1	0	6	2	0	0	0	0	0	243
16:00	4	156	67	2	23	1	0	4	4	3	0	0	0	0	264
17:00	2	132	83	1	31	1	0	3	5	0	0	0	0	0	258
18:00	1	134	75	0	24	0	0	2	3	1	0	0	0	0	240
19:00	2	90	55	2	15	0	0	8	8	0	0	0	0	0	180
20:00	0	88	35	3	16	2	0	0	7	0	0	0	0	0	151
21:00	0	45	23	0	4	0	0	1	4	0	0	0	0	0	77
22:00	0	37	15	0	7	0	0	0	2	0	0	0	0	0	61
23:00	0	15	10	0	4	0	0	1	7	0	0	0	0	0	37
Total	33	1851	1018	24	367	15	0	68	87	6	0	0	0	0	3469
Percent	1.0%	53.4%	29.3%	0.7%	10.6%	0.4%	0.0%	2.0%	2.5%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	09:00	07:00	09:00	07:00		10:00	00:00	07:00					
Vol.	3	130	60	4	26	2		9	7	1					
PM Peak	14:00	13:00	13:00	14:00	14:00	14:00		13:00	19:00	16:00					
Vol.	8	180	99	4	35	5		8	8	3					

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 2
Station ID:
SH 4 N. of Fox Rd.

Date Start: 24-Apr-19
Date End: 29-Apr-19

SB

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/29/19	0	8	6	0	1	0	0	1	2	0	0	0	0	0	18
01:00	0	3	2	1	0	0	0	0	1	0	0	0	0	0	7
02:00	0	2	4	0	0	0	0	1	2	0	0	0	0	0	9
03:00	0	2	2	1	2	0	0	0	2	0	0	0	0	0	9
04:00	0	11	12	0	12	1	0	1	2	0	0	0	0	0	39
05:00	0	30	27	1	18	0	0	5	9	0	0	0	0	0	90
06:00	0	76	64	3	39	0	0	9	7	1	0	0	0	0	199
07:00	0	188	92	10	50	2	0	17	12	0	0	0	0	0	371
08:00	0	143	100	9	46	3	0	15	12	1	0	0	1	0	330
09:00	1	100	66	6	43	0	1	11	7	1	0	0	0	0	236
10:00	0	78	48	2	35	1	0	10	15	0	0	0	0	0	189
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	1	641	423	33	246	7	1	70	71	3	0	0	1	0	1497
Percent	0.1%	42.8%	28.3%	2.2%	16.4%	0.5%	0.1%	4.7%	4.7%	0.2%	0.0%	0.0%	0.1%	0.0%	
AM Peak	09:00	07:00	08:00	07:00	07:00	08:00	09:00	07:00	10:00	06:00			08:00		
Vol.	1	188	100	10	50	3	1	17	15	1			1		
PM Peak Vol.															
Grand Total	115	10870	6576	287	2689	75	3	603	608	38	0	0	4	0	21868
Percent	0.5%	49.7%	30.1%	1.3%	12.3%	0.3%	0.0%	2.8%	2.8%	0.2%	0.0%	0.0%	0.0%	0.0%	

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 2
Station ID:
SH 4 N. of Fox Rd.

Date Start: 24-Apr-19
Date End: 29-Apr-19

SB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 95	96 999	Total	Pace Speed	Number in Pace
04/24/19	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	**4**	**1**	**3**	**12**	39	50	79	34	5	**1**	0	0	0	0	228	56-65	129
15:00	3	0	2	5	37	70	142	45	4	0	0	0	0	0	308	56-65	212
16:00	0	0	0	5	48	133	**181**	**70**	3	0	0	0	0	0	440	56-65	314
17:00	4	0	0	10	**55**	**165**	175	67	4	0	0	0	0	0	**480**	56-65	340
18:00	4	1	2	11	20	85	147	65	**9**	0	**1**	0	0	0	345	56-65	232
19:00	0	0	2	6	34	66	80	21	2	0	0	0	0	0	211	56-65	146
20:00	3	0	2	8	41	54	60	19	0	0	0	0	0	0	187	56-65	114
21:00	0	0	2	8	22	33	42	15	2	0	0	0	0	0	124	56-65	75
22:00	3	1	2	3	9	16	19	8	0	0	1	0	0	0	62	56-65	35
23:00	1	0	1	1	3	4	9	7	1	0	0	0	0	0	27	61-70	16
Total	22	3	16	69	308	676	934	351	30	1	2	0	0	0	2412		
Percent	0.9%	0.1%	0.7%	2.9%	12.8%	28.0%	38.7%	14.6%	1.2%	0.0%	0.1%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak Vol.	14:00 4	14:00 1	14:00 3	14:00 12	17:00 55	17:00 165	16:00 181	16:00 70	18:00 9	14:00 1	18:00 1				17:00 480		

Traffic Engineering Consultants, Inc.

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Site Code: 2
Station ID:
SH 4 N. of Fox Rd.

Date Start: 24-Apr-19
Date End: 29-Apr-19

SB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 95	96 999	Total	Pace Speed	Number in Pace
04/25/19	0	1	1	2	3	3	7	3	0	0	0	0	0	0	20	56-65	10
01:00	0	1	1	1	4	0	3	4	0	0	0	0	0	0	14	61-70	7
02:00	2	3	4	2	2	2	2	4	1	0	0	0	0	0	22	36-45	7
03:00	2	1	0	0	3	2	4	4	0	0	0	0	0	0	16	60-69	8
04:00	1	0	1	2	3	10	11	10	2	0	0	0	0	0	40	56-65	21
05:00	2	**5**	1	3	16	19	25	26	3	**3**	0	0	0	0	103	61-70	51
06:00	1	2	5	5	15	34	62	68	**20**	0	0	0	0	0	212	61-70	130
07:00	**4**	0	**8**	4	25	**114**	**136**	83	12	0	0	0	0	0	**386**	56-65	250
08:00	4	5	5	**10**	**26**	68	121	**89**	6	0	0	0	0	0	334	61-70	210
09:00	2	0	2	10	19	52	104	37	6	0	0	0	0	0	232	56-65	156
10:00	4	0	0	1	25	66	82	37	1	1	0	0	0	0	217	56-65	148
11:00	1	0	4	7	18	50	75	43	7	0	0	0	0	0	205	56-65	125
12 PM	2	0	2	4	10	72	84	26	2	**2**	0	0	0	0	204	56-65	156
13:00	1	0	2	7	28	60	93	35	2	1	0	0	0	0	229	56-65	153
14:00	3	**1**	0	3	21	78	103	37	1	0	0	0	0	0	247	56-65	181
15:00	2	0	**4**	**18**	**56**	106	142	33	8	0	0	0	0	0	369	56-65	248
16:00	3	1	3	11	50	146	157	62	5	2	0	0	0	0	440	56-65	303
17:00	2	0	1	15	51	**180**	**209**	**87**	**14**	1	0	0	0	0	**560**	56-65	389
18:00	**5**	0	0	3	21	110	170	78	13	1	0	0	0	0	401	56-65	280
19:00	1	0	2	5	11	61	95	36	6	0	0	0	0	0	217	56-65	156
20:00	2	0	0	10	25	72	78	52	5	0	0	0	0	0	244	56-65	150
21:00	1	1	4	10	22	41	47	25	3	0	0	0	0	0	154	56-65	88
22:00	1	0	0	1	13	20	21	11	1	0	0	0	0	0	68	56-65	41
23:00	0	0	1	2	7	8	15	7	0	0	0	0	0	0	40	56-65	23
Total	46	21	51	136	474	1374	1846	897	118	11	0	0	0	0	4974		
Percent	0.9%	0.4%	1.0%	2.7%	9.5%	27.6%	37.1%	18.0%	2.4%	0.2%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	05:00	07:00	08:00	08:00	07:00	07:00	08:00	06:00	05:00					07:00		
Vol.	4	5	8	10	26	114	136	89	20	3					386		
PM Peak	18:00	14:00	15:00	15:00	15:00	17:00	17:00	17:00	17:00	12:00					17:00		
Vol.	5	1	4	18	56	180	209	87	14	2					560		

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 2
Station ID:
SH 4 N. of Fox Rd.

Date Start: 24-Apr-19
Date End: 29-Apr-19

SB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 95	96 999	Total	Pace Speed	Number in Pace
04/26/19	0	0	1	1	3	8	10	5	0	0	0	0	0	0	28	56-65	18
01:00	1	0	0	2	4	3	5	3	0	0	0	0	0	0	18	54-63	8
02:00	0	0	0	1	1	3	2	3	1	0	0	0	0	0	11	54-63	5
03:00	0	3	**2**	0	2	3	4	2	1	0	0	0	0	0	17	55-64	7
04:00	3	0	0	1	5	10	9	11	4	0	0	0	0	0	43	61-70	20
05:00	1	**4**	1	4	10	15	29	23	5	0	0	0	0	0	92	61-70	52
06:00	**4**	0	0	1	5	15	53	57	18	1	0	0	0	0	154	61-70	110
07:00	3	0	0	0	14	28	**126**	75	**20**	**2**	0	0	0	0	268	61-70	201
08:00	3	0	0	5	30	56	98	**76**	11	1	0	0	0	0	**280**	61-70	174
09:00	3	0	0	3	25	52	102	41	8	0	0	0	0	0	234	56-65	154
10:00	4	0	1	3	19	**66**	87	40	8	1	0	0	0	0	229	56-65	153
11:00	2	0	1	**7**	**37**	55	125	36	4	0	0	0	0	0	267	56-65	180
12 PM	1	0	1	4	30	77	118	45	1	0	0	0	0	0	277	56-65	195
13:00	3	0	0	9	37	92	109	26	2	0	0	0	0	0	278	56-65	201
14:00	2	0	1	9	33	98	116	42	1	0	0	0	0	0	302	56-65	214
15:00	**8**	0	4	12	45	133	146	29	4	0	0	0	0	0	381	56-65	279
16:00	5	0	0	15	74	174	**194**	**69**	2	0	0	0	0	0	533	56-65	368
17:00	5	0	**10**	**44**	**114**	**232**	172	54	2	0	0	0	0	0	**633**	56-65	404
18:00	2	0	1	24	78	153	130	65	4	0	0	0	0	0	457	56-65	283
19:00	2	0	0	7	34	64	97	44	**5**	**1**	0	0	0	0	254	56-65	161
20:00	0	0	2	6	28	54	70	32	2	1	**1**	0	0	0	196	56-65	124
21:00	0	**2**	0	16	32	53	42	17	2	0	0	0	0	0	164	56-65	95
22:00	4	2	2	12	20	42	40	6	2	0	0	0	0	0	130	56-65	82
23:00	0	0	2	2	6	12	27	8	1	0	0	0	0	0	58	56-65	39
Total	56	11	29	188	686	1498	1911	809	108	7	1	0	0	0	5304		
Percent	1.1%	0.2%	0.5%	3.5%	12.9%	28.2%	36.0%	15.3%	2.0%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	06:00	05:00	03:00	11:00	11:00	10:00	07:00	08:00	07:00	07:00					08:00		
Vol.	4	4	2	7	37	66	126	76	20	2					280		
PM Peak	15:00	21:00	17:00	17:00	17:00	17:00	16:00	16:00	19:00	19:00	20:00				17:00		
Vol.	8	2	10	44	114	232	194	69	5	1	1				633		

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SH 4 N. of Fox Rd.

Date Start: 24-Apr-19
Date End: 29-Apr-19

SB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 95	96 999	Total	Pace Speed	Number in Pace
04/27/19	2	0	0	3	4	17	13	4	0	0	0	0	0	0	43	56-65	30
01:00	0	0	0	3	5	9	8	3	0	0	0	0	0	0	28	56-65	17
02:00	1	0	**3**	2	3	4	6	2	2	0	0	0	0	0	23	56-65	10
03:00	0	0	3	0	4	3	6	2	0	0	0	0	0	0	18	55-64	9
04:00	1	0	1	6	2	4	5	4	3	1	0	0	0	0	27	56-65	9
05:00	2	0	1	4	4	10	18	15	1	0	0	0	0	0	55	61-70	33
06:00	4	0	0	1	9	24	39	32	4	0	0	0	0	0	113	61-70	71
07:00	0	0	1	4	17	30	75	42	3	1	**1**	0	0	0	174	61-70	117
08:00	**6**	0	0	1	12	63	94	37	**7**	0	0	0	0	0	220	56-65	157
09:00	3	0	2	**7**	24	74	**116**	42	4	**2**	0	0	0	0	**274**	56-65	190
10:00	3	0	0	4	**28**	**86**	100	**43**	2	0	0	0	0	0	266	56-65	186
11:00	0	0	3	5	14	85	105	42	6	0	0	0	0	0	260	56-65	190
12 PM	3	**1**	1	7	22	80	114	42	**10**	**2**	0	0	0	0	282	56-65	194
13:00	**5**	0	**3**	6	**41**	**93**	102	36	6	1	0	0	0	0	293	56-65	195
14:00	0	1	0	3	32	82	106	51	4	1	0	0	0	0	280	56-65	188
15:00	0	1	3	8	40	86	120	42	3	0	0	0	0	0	303	56-65	206
16:00	3	0	0	4	28	91	133	**63**	7	0	0	0	0	0	**329**	56-65	224
17:00	2	0	3	9	24	69	**138**	55	7	2	0	0	0	0	309	56-65	207
18:00	2	0	0	1	24	68	86	63	4	0	0	0	0	0	248	56-65	154
19:00	1	0	2	2	13	39	101	30	7	0	0	0	0	0	195	56-65	140
20:00	0	0	1	7	12	47	69	33	2	1	0	0	0	0	172	56-65	116
21:00	2	0	1	**14**	20	41	44	27	1	0	0	0	0	0	150	56-65	85
22:00	2	0	1	4	18	27	39	14	2	1	0	0	0	0	108	56-65	66
23:00	4	1	0	3	8	13	17	14	2	0	0	0	0	0	62	59-68	31
Total	46	4	29	108	408	1145	1654	738	87	12	1	0	0	0	4232		
Percent	1.1%	0.1%	0.7%	2.6%	9.6%	27.1%	39.1%	17.4%	2.1%	0.3%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00		02:00	09:00	10:00	10:00	09:00	10:00	08:00	09:00	07:00				09:00		
Vol.	6		3	7	28	86	116	43	7	2	1				274		
PM Peak	13:00	12:00	13:00	21:00	13:00	13:00	17:00	16:00	12:00	12:00					16:00		
Vol.	5	1	3	14	41	93	138	63	10	2					329		

Traffic Engineering Consultants, Inc.

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Site Code: 2
Station ID:
SH 4 N. of Fox Rd.

Date Start: 24-Apr-19
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SB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 95	96 999	Total	Pace Speed	Number in Pace
04/28/19	1	0	0	1	2	14	14	1	1	0	0	0	0	0	34	56-65	28
01:00	**3**	0	2	0	5	2	7	5	1	0	0	0	0	0	25	61-70	12
02:00	0	0	0	0	2	3	2	2	1	0	0	0	0	0	10	56-65	5
03:00	0	0	0	0	3	3	6	2	1	1	0	0	0	0	16	56-65	9
04:00	1	0	0	2	1	3	3	8	1	1	0	0	0	0	20	61-70	11
05:00	0	0	0	0	4	8	14	14	6	0	0	0	0	0	46	61-70	28
06:00	0	0	0	1	2	8	29	24	3	0	**1**	0	0	0	68	61-70	53
07:00	0	0	0	4	10	24	28	32	4	0	1	0	0	0	103	61-70	60
08:00	0	0	0	1	8	21	49	38	**11**	**3**	1	0	0	0	132	61-70	87
09:00	1	0	0	1	10	32	**91**	**59**	10	1	0	0	0	0	205	61-70	150
10:00	3	0	**3**	**11**	**25**	46	83	20	5	0	0	0	0	0	196	56-65	129
11:00	1	0	0	2	25	**55**	84	55	4	0	0	0	0	0	**226**	56-65	139
12 PM	3	0	0	2	27	84	**104**	47	4	**1**	0	0	0	0	272	56-65	188
13:00	**8**	1	6	10	**45**	**100**	104	44	1	1	0	0	0	0	**320**	56-65	204
14:00	3	**5**	**11**	**13**	36	93	89	33	4	1	**1**	0	0	0	289	56-65	182
15:00	1	0	3	3	42	78	80	34	2	0	0	0	0	0	243	56-65	158
16:00	5	3	9	8	35	71	95	32	**7**	0	0	0	0	0	265	56-65	166
17:00	3	5	5	4	23	94	72	**50**	2	0	0	0	0	0	258	56-65	166
18:00	1	0	1	5	21	60	102	43	7	1	0	0	0	0	241	56-65	162
19:00	3	2	6	7	13	44	70	33	3	0	0	0	0	0	181	56-65	114
20:00	1	0	2	6	21	42	51	27	2	0	0	0	0	0	152	56-65	93
21:00	0	0	3	5	16	21	20	10	1	0	0	**1**	0	0	77	56-65	41
22:00	0	0	2	1	11	15	23	7	2	0	0	0	0	0	61	56-65	38
23:00	2	0	0	5	3	7	12	8	0	0	0	0	0	0	37	61-70	20
Total	40	16	53	92	390	928	1232	628	83	10	4	1	0	0	3477		
Percent	1.2%	0.5%	1.5%	2.6%	11.2%	26.7%	35.4%	18.1%	2.4%	0.3%	0.1%	0.0%	0.0%	0.0%			
AM Peak	01:00		10:00	10:00	10:00	11:00	09:00	09:00	08:00	08:00	06:00				11:00		
Vol.	3		3	11	25	55	91	59	11	3	1				226		
PM Peak	13:00	14:00	14:00	14:00	13:00	13:00	12:00	17:00	16:00	12:00	14:00	21:00			13:00		
Vol.	8	5	11	13	45	100	104	50	7	1	1	1			320		

Traffic Engineering Consultants, Inc.

6000 S. Western Ave. Suite 300
Oklahoma CIty, OK. 73139

Site Code: 2
Station ID:
SH 4 N. of Fox Rd.

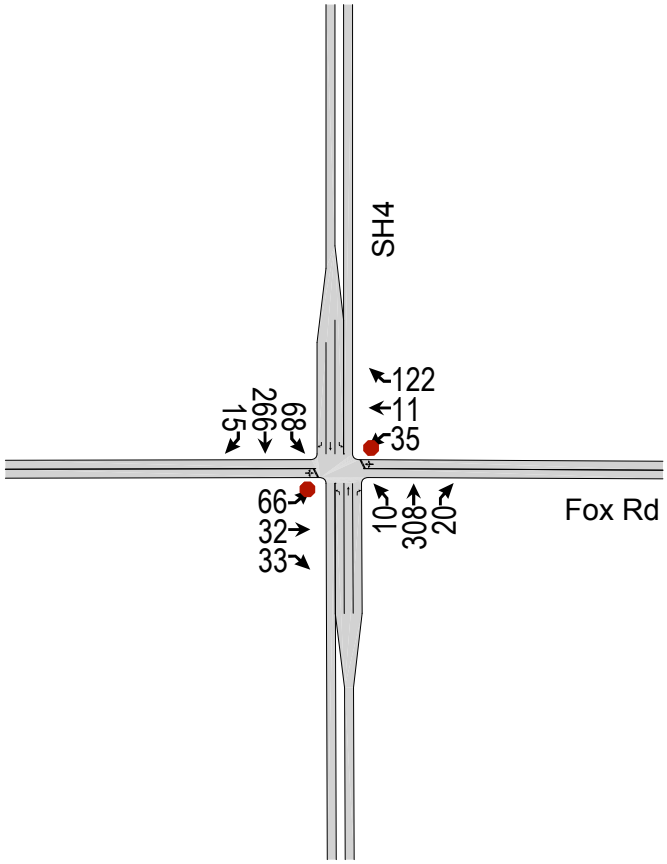
Date Start: 24-Apr-19
Date End: 29-Apr-19

SB

Start Time	1 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 80	81 85	86 90	91 95	96 999	Total	Pace Speed	Number in Pace
04/29/19	1	0	0	0	3	3	5	3	2	0	**2**	0	0	0	19	57-66	8
01:00	0	0	0	3	2	0	1	1	0	0	0	0	0	0	7	46-55	5
02:00	0	0	0	0	0	2	4	2	0	**1**	0	0	0	0	9	61-70	6
03:00	1	0	0	0	0	3	4	2	0	0	0	0	0	0	10	56-65	7
04:00	3	0	0	0	1	5	15	12	2	1	0	0	0	0	39	61-70	27
05:00	3	0	1	2	5	18	38	18	6	0	0	0	0	0	91	61-70	56
06:00	3	0	1	6	7	34	84	60	4	0	0	0	0	0	199	61-70	144
07:00	3	**4**	**5**	9	47	**90**	**123**	**81**	**9**	1	0	0	0	0	**372**	56-65	213
08:00	4	0	1	**14**	**63**	79	117	45	7	1	0	0	0	0	331	56-65	196
09:00	0	0	5	8	27	86	81	24	4	1	0	0	0	0	236	56-65	167
10:00	**5**	0	1	8	24	49	76	25	2	0	0	0	0	0	190	56-65	125
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	23	4	14	50	179	369	548	273	36	5	2	0	0	0	1503		
Percent	1.5%	0.3%	0.9%	3.3%	11.9%	24.6%	36.5%	18.2%	2.4%	0.3%	0.1%	0.0%	0.0%	0.0%			
AM Peak	10:00	07:00	07:00	08:00	08:00	07:00	07:00	07:00	07:00	02:00	00:00				07:00		
Vol.	5	4	5	14	63	90	123	81	9	1	2				372		
PM Peak Vol.																	
Total	233	59	192	643	2445	5990	8125	3696	462	46	10	1	0	0	21902		
Percent	1.1%	0.3%	0.9%	2.9%	11.2%	27.3%	37.1%	16.9%	2.1%	0.2%	0.0%	0.0%	0.0%	0.0%			

	15th Percentile :	54 MPH
	50th Percentile :	60 MPH
	85th Percentile :	66 MPH
	95th Percentile :	69 MPH
Stats	10 MPH Pace Speed :	56-65 MPH
	Number in Pace :	14115
	Percent in Pace :	64.4%
	Number of Vehicles > 55 MPH :	18330
	Percent of Vehicles > 55 MPH :	83.7%
	Mean Speed(Average) :	60 MPH

Intersection Capacity Analysis


SH4
Fox Rd
15
266
68
122
11
35
66
32
33
10
308
20

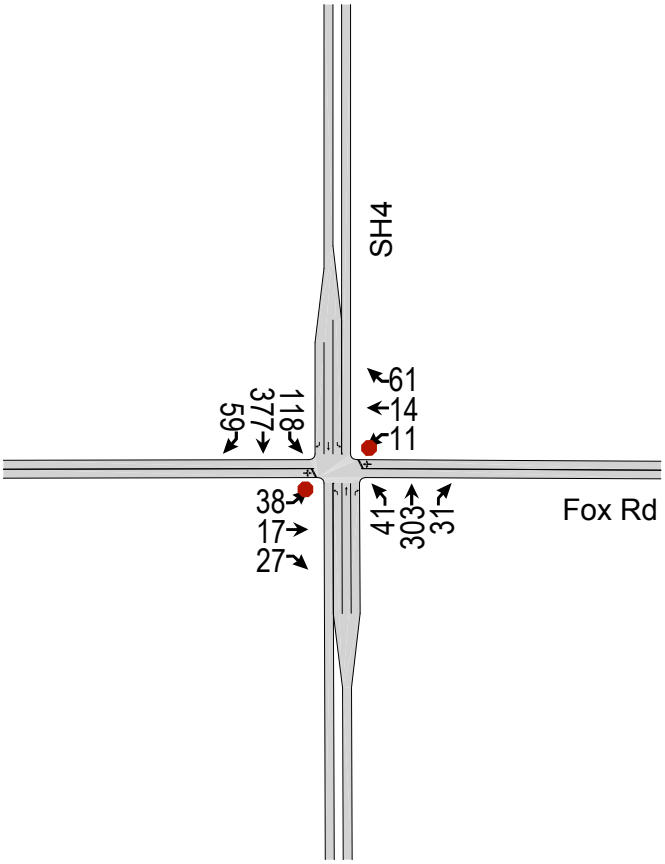
Intersection	
Int Delay, s/veh	23.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	66	32	33	35	11	122	10	308	20	68	266	15
Future Vol, veh/h	66	32	33	35	11	122	10	308	20	68	266	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	175	-	175	180	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	68	83	68	40	73	63	82	72	60	86	50
Heavy Vehicles, %	3	3	3	4	4	4	8	8	8	7	7	7
Mvmt Flow	92	47	40	51	28	167	16	376	28	113	309	30

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1055	971	309	1002	973	376	339	0	0	404	0	0
Stage 1	535	535	-	408	408	-	-	-	-	-	-	-
Stage 2	520	436	-	594	565	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.14	6.54	6.24	4.18	-	-	4.17	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.536	4.036	3.336	2.272	-	-	2.263	-	-
Pot Cap-1 Maneuver	203	252	729	219	250	666	1187	-	-	1128	-	-
Stage 1	527	522	-	616	593	-	-	-	-	-	-	-
Stage 2	537	578	-	488	505	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	126	224	729	159	222	666	1187	-	-	1128	-	-
Mov Cap-2 Maneuver	126	224	-	159	222	-	-	-	-	-	-	-
Stage 1	520	470	-	608	585	-	-	-	-	-	-	-
Stage 2	378	570	-	374	455	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	117.6	35.9	0.3	2.1
HCM LOS	F	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1187	-	-	180	352	1128	-	-
HCM Lane V/C Ratio	0.013	-	-	0.992	0.699	0.1	-	-
HCM Control Delay (s)	8.1	-	-	117.6	35.9	8.5	-	-
HCM Lane LOS	A	-	-	F	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	8.1	5	0.3	-	-


SH4
Fox Rd
59
377
118
61
14
11
38
17
27
41
303
31

Intersection	
Int Delay, s/veh	7.6

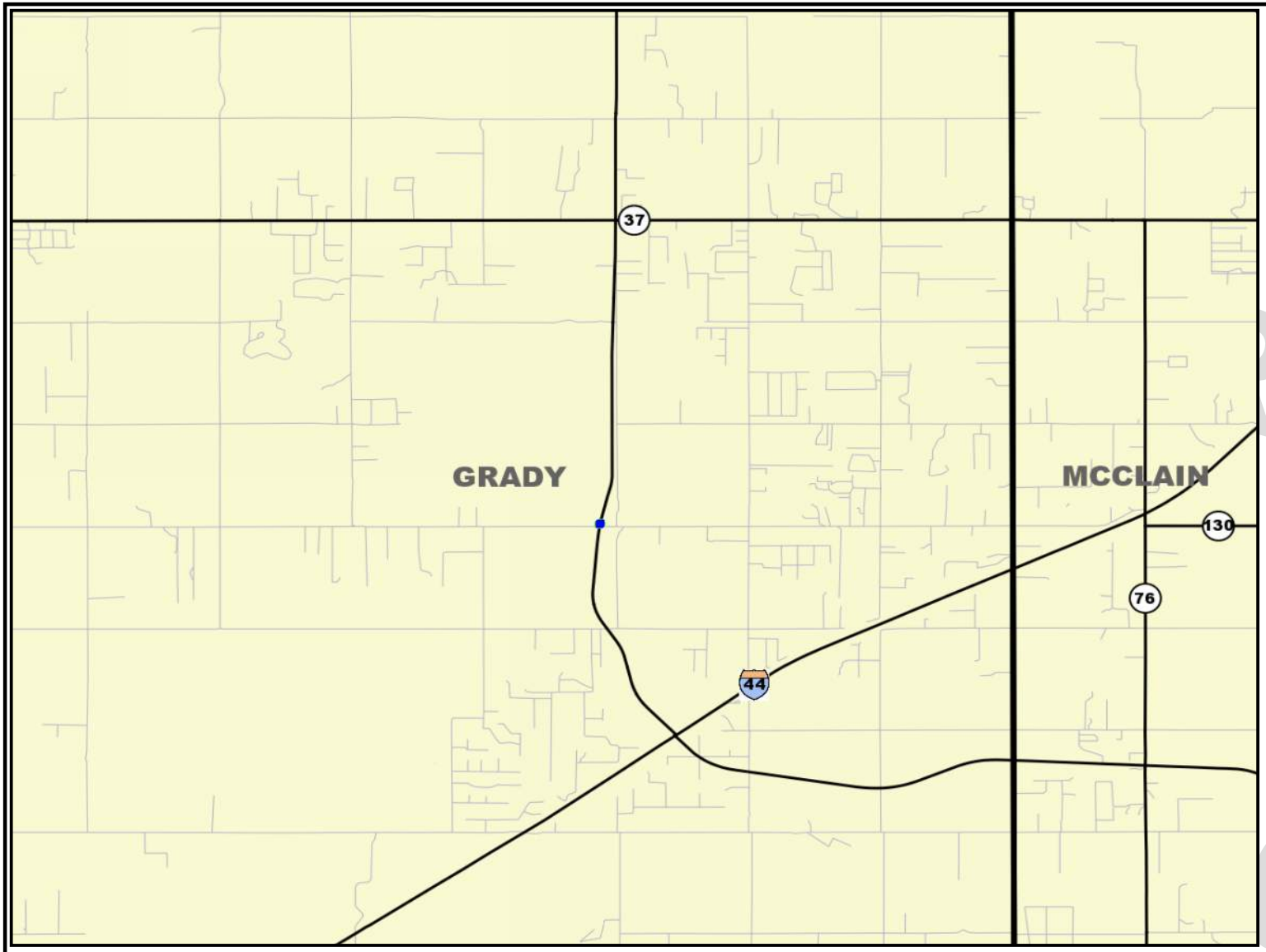
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	17	27	11	14	61	41	303	31	118	377	59
Future Vol, veh/h	38	17	27	11	14	61	41	303	31	118	377	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	175	-	175	180	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	85	85	55	70	90	79	91	78	80	91	78
Heavy Vehicles, %	3	3	3	4	4	4	8	8	8	7	7	7
Mvmt Flow	44	20	32	20	20	68	52	333	40	148	414	76

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1211	1187	414	1211	1223	333	490	0	0	373	0	0
Stage 1	710	710	-	437	437	-	-	-	-	-	-	-
Stage 2	501	477	-	774	786	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.14	6.54	6.24	4.18	-	-	4.17	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.536	4.036	3.336	2.272	-	-	2.263	-	-
Pot Cap-1 Maneuver	158	188	636	158	178	704	1043	-	-	1159	-	-
Stage 1	423	435	-	594	576	-	-	-	-	-	-	-
Stage 2	550	554	-	388	400	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	111	156	636	118	147	704	1043	-	-	1159	-	-
Mov Cap-2 Maneuver	111	156	-	118	147	-	-	-	-	-	-	-
Stage 1	402	379	-	564	547	-	-	-	-	-	-	-
Stage 2	455	526	-	305	349	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	52	27.2	1.1	2
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1043	-	-	167	268	1159	-	-
HCM Lane V/C Ratio	0.05	-	-	0.572	0.402	0.127	-	-
HCM Control Delay (s)	8.6	-	-	52	27.2	8.6	-	-
HCM Lane LOS	A	-	-	F	D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	3	1.8	0.4	-	-

Intersection Collision Data



Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 04/29/2019
by Todd Butler

Study Map & Totals

Legend

- Fatality
- Injury
- Property Damage

N
W E
S

Remarks:

NONE

SH 4 AND FOX RD - GRADY COUNTY

Date Range: 01-01-2014 thru 12-31-2018

	2014						2015						2016					
	Fat	Incap Inj	Non-Incap Inj	Poss Inj	PD	Tot	Fat	Incap Inj	Non-Incap Inj	Poss Inj	PD	Tot	Fat	Incap Inj	Non-Incap Inj	Poss Inj	PD	Tot
Collisions			1		1	2			2		1	3						0
Persons			4			4			5	1		6						0

SH 4 AND FOX RD - GRADY COUNTY

Date Range: 01-01-2014 Thru 12-31-2018

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 04/29/2019 by Todd Butler

	2017*						2018*					
	Fat	Incap Inj	Non-Incap Inj	Poss Inj	PD	Tot	Fat	Incap Inj	Non-Incap Inj	Poss Inj	PD	Tot
Collisions				1	3	4			1		1	2
Persons				1		1			3			3

* DENOTES A YEAR FOR WHICH DATA MAY BE INCOMPLETE.

	Study Total					
	Fatality	Incapacitating Injury	Non-Incapacitating Injury	Possible Injury	Property Damage	Total
Collisions			4	1	6	11
Persons			12	2		14

TABULATION OF COLLISIONS

SH 4 AND FOX RD - GRADY COUNTY

Date Range: 01-01-2014 Thru 12-31-2018

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 04/29/2019 by Todd Butler

Collisions By Type Of Collision

Type Of Collision	2014				2015				2016				2017*				2018*			
	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot
Rear-End (front-to-rear)																				
Head-On (front-to-front)																				
Right Angle (front-to-side)		1		1		2	1	3							3	3		1		1
Angle Turning			1	1															1	1
Other Angle																				
Sideswipe Same Direction																				
Sideswipe Opposite Direction																				
Fixed Object																				
Pedestrian																				
Pedal Cycle																				
Animal																				
Overturn/Rollover														1		1				
Vehicle-Train																				
Other Single Vehicle Crash																				
Other																				
Total		1	1	2		2	1	3						1	3	4		1	1	2
Percent		9.1	9.1	18.2		18.2	9.1	27.3						9.1	27.3	36.4		9.1	9.1	18.2

Collisions By Type Of Collision

Type Of Collision	Total				
	Fat	Inj *	PD	Tot	Pct
Rear-End (front-to-rear)					
Head-On (front-to-front)					
Right Angle (front-to-side)		4	4	8	72.7
Angle Turning			2	2	18.2
Other Angle					
Sideswipe Same Direction					
Sideswipe Opposite Direction					
Fixed Object					
Pedestrian					
Pedal Cycle					
Animal					
Overturn/Rollover		1		1	9.1
Vehicle-Train					
Other Single Vehicle Crash					
Other					
Total		5	6	11	100
Percent		45.5	54.5	100	

*** INCLUDES INCAPACITATING, NON-INCAPACITATING, AND POSSIBLE INJURIES.**

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 04/29/2019 by Todd Butler

Units By Unit Type

Unit Type	2014				2015				2016				2017*				2018*			
	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot
Train																				
Pedestrian																				
Animal																				
Pedal Cycle																				
Parked Vehicle																				
CMV														1	1	2				
Other Single Vehicle																				
Other Multi-Vehicle		2	2	4		4	2	6							5	5		2	2	4
Total		2	2	4		4	2	6						1	6	7		2	2	4
Percent		9.5	9.5	19.0		19.0	9.5	28.6						4.8	28.6	33.3		9.5	9.5	19.0

Units By Unit Type

Unit Type	Total				
	Fat	Inj *	PD	Tot	Pct
Train					
Pedestrian					
Animal					
Pedal Cycle					
Parked Vehicle					
CMV		1	1	2	9.5
Other Single Vehicle					
Other Multi-Vehicle		8	11	19	90.5
Total		9	12	21	100
Percent		42.9	57.1	100	

* INCLUDES INCAPACITATING, NON-INCAPACITATING, AND POSSIBLE INJURIES.

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 04/29/2019 by Todd Butler

Vehicles By Vehicle Type

Vehice Type	2014				2015				2016				2017*				2018*			
	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot	Fat	Inj *	PD	Tot
Passenger Vehicle-2 Door							1	1												
Passenger Vehicle-4 Door			1	1		2	2	4							3	3		1		1
Passenger Vehicle-Convertible															1	1				
Pickup Truck		1		1		1		1												
Single-Unit Truck (2 axles)															1	1				
Single-Unit Truck (3 or more axles)																				
School Bus																				
Truck/Trailer																				
Truck-Tractor (bobtail)																				
Truck-Tractor/Semi-Trailer																				
Truck-Tractor/Double														1		1				
Truck-Tractor/Triple																				
Bus/Large Van (9-15 seats)																				
Bus (16+ seats)																				
Motorcycle																				
Motor Scooter/Moped																				
Motor Home																				
Farm Machinery																				
ATV																				
Sport Utility Vehicle (SUV)		1	1	2											1	1		1	2	3
Passenger Van																				
Truck More Than 10,000 lbs.																				
Van (10,000 lbs. or less)																				
Other																				
Total		2	2	4		3	3	6						1	6	7		2	2	4
Percent		9.5	9.5	19.0		14.3	14.3	28.6						4.8	28.6	33.3		9.5	9.5	19.0

* INCLUDES INCAPACITATING, NON-INCAPACITATING, AND POSSIBLE INJURIES.

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 04/29/2019 by Todd Butler

Vehicles By Vehicle Type

Vehice Type	Total				
	Fat	Inj *	PD	Tot	Pct
Passenger Vehicle-2 Door			1	1	4.8
Passenger Vehicle-4 Door		3	6	9	42.9
Passenger Vehicle-Convertible			1	1	4.8
Pickup Truck		2		2	9.5
Single-Unit Truck (2 axles)			1	1	4.8
Single-Unit Truck (3 or more axles)					
School Bus					
Truck/Trailer					
Truck-Tractor (bobtail)					
Truck-Tractor/Semi-Trailer					
Truck-Tractor/Double		1		1	4.8
Truck-Tractor/Triple					
Bus/Large Van (9-15 seats)					
Bus (16+ seats)					
Motorcycle					
Motor Scooter/Moped					
Motor Home					
Farm Machinery					
ATV					
Sport Utility Vehicle (SUV)		2	4	6	28.6
Passenger Van					
Truck More Than 10,000 lbs.					
Van (10,000 lbs. or less)					
Other					
Total		8	13	21	100
Percent		38.1	61.9	100	

* INCLUDES INCAPACITATING, NON-INCAPACITATING, AND POSSIBLE INJURIES.

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 04/29/2019 by Todd Butler

Day And Time Of Occurrence Of Collisions

Day	Hour Of The Day																								
	AM												PM												
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	Tot	Pcnt
Sunday													1												1	9.1
Monday																	1								1	9.1
Tuesday									1		1					1									3	27.3
Wednesday																								1	1	9.1
Thursday																1	1			1		1			4	36.4
Friday							1																		1	9.1
Saturday																										
	Early Morning - Sunrise						Morning Peak			Mid Morning/Afternoon						PM Peak			Evening - Late Night						Tot	100
Total							2			2						4			3						11	
Percent							18.2			18.2						36.4			27.3						100	

Roadway/Lighting

Roadway Conditions	Lighting Conditions					Total	Percent
	Daylight	Darkness	Twilight	Lighted	Unknown		
Dry	5	4	1			10	90.9
Wet (Water)			1			1	9.1
Ice, Snow, or Slush							
Mud, Dirt, Gravel, or Sand							
Other							
Total	5	4	2			11	100
Percent	45.5	36.4	18.2			100	

Weather Conditions

Weather Conditions	Total	Percent
Clear	6	54.5
Clouds Present	4	36.4
Raining/Fog	1	9.1
Snowing/Sleet/Hail		
Other		
Total	11	100

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 04/29/2019 by Todd Butler

Drivers By Driver Conditions

Unsafe/Unlawful	Apparently Normal			Alcohol Involved						Sleep Suspected			Drug Use Indicated			Unknown Condition			Total				
				Ability Impaired			Odor Detected																
	Fat	Inj *	PD	Fat	Inj *	PD	Fat	Inj *	PD	Fat	Inj *	PD	Fat	Inj *	PD	Fat	Inj *	PD	Fat	Inj *	PD	Total	Pcnt
Failed to Yield		3	5																	3	5	8	38.1
Failed to Stop																							
Failed to Signal																							
Improper Turn			1																		1	1	4.8
Improper Start																							
Improper Stop																							
Improper Backing																							
Improper Parking																							
Improper Passing																							
Improper Lane Change																							
Left of Center																							
Following Too Close																							
Unsafe Speed		1																		1		1	4.8
DWI					1															1		1	4.8
Inattention																							
Negligent Driving																							
Defective Vehicle																							
Wrong Way																							
No Improper Action		4	6																	4	6	10	47.6
Other																							
Total		8	12		1															9	12	21	100
Percent		38.1	57.1		4.8															42.9	57.1	100	

Severities Indicate Highest Severity in Collision

Collisions By Special Feature

Special Feature	Total			
	Fat	Inj *	PD	Tot
Bridge				
Work Zone				
Cross Median				
Train Collision				

* INCLUDES INCAPACITATING, NON-INCAPACITATING, AND POSSIBLE INJURIES.

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 04/29/2019 by Todd Butler

Intersection Collision Diagram

SH 4 AND FOX RD - GRADY COUNTY

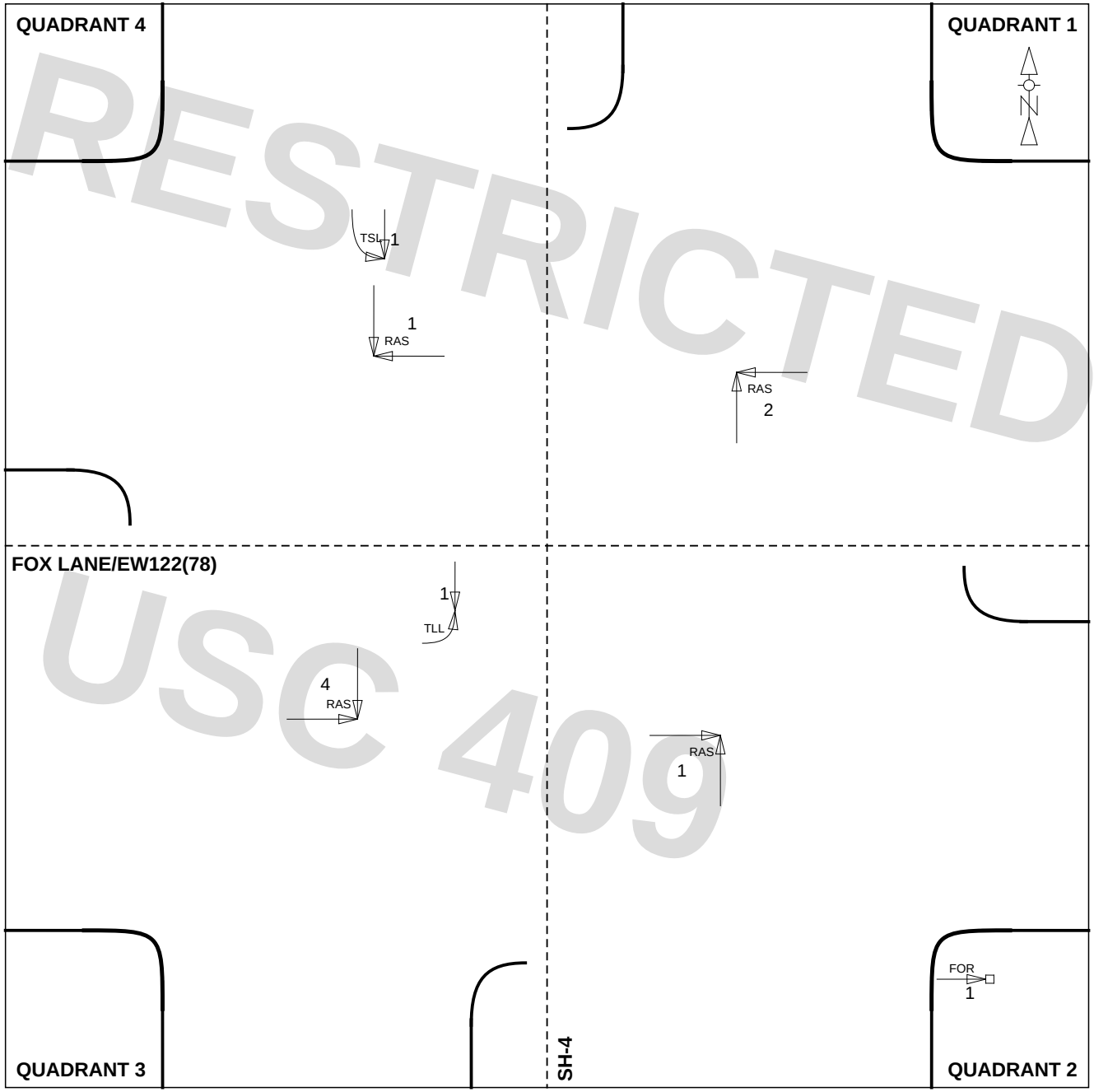
Location: GRADY County
SH-4
at
(02.24) - FOX LANE/EW122(78)

Time Period: 01-01-2014 to 12-31-2018

Printed Collisions (11)

Date	Quadrant	Manner of Collision
2014-02-11	2	RAS - RIGHT ANGLE STRAIGHT
2015-01-22	3	RAS - RIGHT ANGLE STRAIGHT
2015-06-23	3	RAS - RIGHT ANGLE STRAIGHT
2015-11-26	3	RAS - RIGHT ANGLE STRAIGHT
2017-04-20	3	RAS - RIGHT ANGLE STRAIGHT
2017-08-01	1	RAS - RIGHT ANGLE STRAIGHT
2017-12-07	1	RAS - RIGHT ANGLE STRAIGHT
2018-10-07	4	RAS - RIGHT ANGLE STRAIGHT
2018-05-21	3	TLL - TURNING LEFT, LEFT
2014-11-07	4	TSL - TURNING STRAIGHT, LEFT
2017-11-01	2	FOR - FIXED OBJECT, RIGHT (SIDE)

Intersection Collisions Not Printed (0)



NOTE LETTERS DENOTE COLLISION TYPE NUMBERS DENOTE NUMBER OF OCCURENCES.

HIGHWAY SYSTEM COLLISION LISTING

SH 4 AND FOX RD - GRADY COUNTY

Date Range: 01-01-2014 Thru 12-31-2018

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 04/29/2019 by Todd Butler

Cnty	City	CS #	Int. #	Mile Post	Location	Features	Int. Related	On Map	Dir. 1	Dir. 2	# Veh.	# Inj.*	# Fat.	Type of Collision	Unsafe Unlawful	Lighting Cond.	Roadway Cond.	Severity	Date
(26) GRADY				(00)	HWY: SH-4									AT: FOX LANE/EW122(78)					
26		50		02.24	FOX LANE/EW122(78)		YES	Y	E	N	2	4		RIGHT-ANGLE	F-YIELD	DARK	DRY	N-I INJ	02-11-2014
26		50		02.24	FOX LANE/EW122(78)		YES	Y	S	S	2			ANGLE-TURNING	IMP-TURN	DAWN	DRY	PDO	11-07-2014
26		50		02.24	FOX LANE/EW122(78)		YES	Y	E	S	2	1		RIGHT-ANGLE	D-W-I	DYLGT	DRY	N-I INJ	01-22-2015
26		50		02.24	FOX LANE/EW122(78)		YES	Y	E	S	2	5		RIGHT-ANGLE	F-YIELD	DYLGT	DRY	N-I INJ	06-23-2015
26		50		02.24	FOX LANE/EW122(78)		YES	Y	E	S	2			RIGHT-ANGLE	F-YIELD	DUSK	WET	PDO	11-26-2015
26		50		02.24	FOX LANE/EW122(78)		YES	Y	S	E	2			RIGHT-ANGLE	F-YIELD	DARK	DRY	PDO	04-20-2017
26		50		02.24	FOX LANE/EW122(78)		YES	Y	W	N	2			RIGHT-ANGLE	F-YIELD	DYLGT	DRY	PDO	08-01-2017
26		50		02.24	FOX LANE/EW122(78)		YES	Y	S	-	1	1		ROLLOVER	UNSAF-SPD	DARK	DRY	P INJ	11-01-2017
26		50		02.24	FOX LANE/EW122(78)		YES	Y	S	W	2			RIGHT-ANGLE	F-YIELD	DARK	DRY	PDO	12-07-2017
26		50		02.24	FOX LANE/EW122(78)		YES	Y	S	E	2			ANGLE-TURNING	F-YIELD	DYLGT	DRY	PDO	05-21-2018
26		50		02.24	FOX LANE/EW122(78)		YES	Y	W	S	2	3		RIGHT-ANGLE	F-YIELD	DYLGT	DRY	N-I INJ	10-07-2018

*** INCLUDES INCAPACITATING, NON-INCAPACITATING, AND POSSIBLE INJURIES.**

STUDY CRITERIA

SH 4 AND FOX RD - GRADY COUNTY

Date Range: 01-01-2014 Thru 12-31-2018

Program Provided by:
Traffic Engineering Division
Collision Analysis and Safety Branch
(405) 522-0985
Created: 04/29/2019 by Todd Butler

ROADWAY / REGION

QUERY OVER	SELECTIONS
Control Section	County: 26, Control Section: 50, CS Query On: intersection, Mile: 02.24

DATE

Date Range	01-01-2014 to 12-31-2018

REPORT SECTIONS

Collision Map & Study Totals	(Included)
Collision Analysis Tables	(Included)
- Other Analysis Tables	Checked
Collision Diagram	(Included)
Collision Listing	(Included)
- Highway Collision Listing	Checked, By Control Section
Query Criteria	(Included)

FILTER COLLISIONS

Roadway Type	All Collision Data
Intersection Related Only	Checked
Incl. Crashes Assoc. w/ Every Int.	Checked
Environment Fields	

Traffic Signal Warrant Analysis

Traffic Engineering Consultants, Inc.

T-2525 OK Heart Hospital South

Projected 2026 Total Traffic

Study Name: SH 4 and Fox Rd 2019 Traffic

Study Date : 4/25/2019

Signal Warrants - Summary

Major Street Approaches

Northbound: SH 4
Number of Lanes : 2+

Total Approach Volume: 3,577

Southbound: SH 4
Number of Lanes :2+

Total Approach Volume: 4,684

Minor Street Approaches

Eastbound: Fox Rd
Number of Lanes :1

Total Approach Volume: 1,062

Westbound: Fox Rd
Number of Lanes :1

Total Approach Volume: 1,313

Warrant Summary (Rural Values Apply)

Warrant 1 - Eight Hour Vehicular Volumes..... **Not Satisfied**

Warrant 1A - Minimum Vehicular Volume..... **Not Satisfied**
Required volumes reached for 4 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic..... **Not Satisfied**
Required volumes reached for 4 hours, 8 are needed

Warrant 1C - Combination of Warrants..... **Not Satisfied**
Required 1A volumes reached for 6 hours, 8 are needed
Required 1B volumes reached for 6 hours, 8 are needed

Warrant 2 - Four Hour Volumes..... **Not Satisfied**
Number of hours (3) volumes exceed minimum < minimum required (4).

Warrant 3 - Peak Hour..... **Satisfied**

Warrant 3A - Peak Hour Delay..... **Satisfied**
Number of one hour periods (12) volumes exceed minimum >= required (1). Delay data not evaluated.

Warrant 3B - Peak Hour Volumes..... **Not Satisfied**
Volumes do not exceed minimums for any one hour period.

Warrant 4 - Pedestrian Volumes..... **Not Evaluated**

Warrant 5 - School Crossing..... **Not Evaluated**

Warrant 6 - Coordinated Signal System..... **Not Evaluated**

Warrant 7 - Crash Experience..... **Not Evaluated**

Warrant 8 - Roadway Network..... **Not Evaluated**

Warrant 9 - Intersection Near a Grade Crossing..... **Not Evaluated**

Traffic Engineering Consultants, Inc.

T-2525 OK Heart Hospital South

Projected 2026 Total Traffic

Study Name: SH 4 and Fox Rd 2019 Traffic

Study Date : 4/25/2019

Warrant 1A - Minimum Volumes

Description

Intended for sites where the volume of intersecting traffic is the principal reason for consideration of a signal installation.

Summary

Only 4 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **True**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Volume Requirements

Rural Factor of 70 % applied
Veh/Hr Major = **420**

Veh/Hr Minor = **105**

	Major Road SH 4					Minor Road Fox Rd		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
15:00 - 16:00	316	+	478	=	794	67	128	Yes
06:00 - 07:00	338	+	349	=	687	168	131	Yes
14:00 - 15:00	286	+	357	=	643	58	110	Yes
07:00 - 08:00	207	+	309	=	516	71	117	Yes
16:00 - 17:00	381	+	528	=	909	77	87	No
16:15 - 17:15	381	+	528	=	909	77	87	No
16:30 - 17:30	381	+	528	=	909	77	87	No
16:45 - 17:45	381	+	528	=	909	77	87	No
17:00 - 18:00	216	+	353	=	569	42	61	No
17:15 - 18:15	216	+	353	=	569	42	61	No
17:30 - 18:30	216	+	353	=	569	42	61	No
17:45 - 18:45	216	+	353	=	569	42	61	No
05:00 - 06:00	260	+	221	=	481	93	102	No
05:15 - 06:15	260	+	221	=	481	93	102	No
05:30 - 06:30	260	+	221	=	481	93	102	No
05:45 - 06:45	260	+	221	=	481	93	102	No
13:00 - 14:00	208	+	244	=	452	38	56	No
13:15 - 14:15	208	+	244	=	452	38	56	No
13:30 - 14:30	208	+	244	=	452	38	56	No
13:45 - 14:45	208	+	244	=	452	38	56	No
08:00 - 09:00	158	+	235	=	393	61	59	No
08:15 - 09:15	158	+	235	=	393	61	59	No
08:30 - 09:30	158	+	235	=	393	61	59	No
08:45 - 09:45	158	+	235	=	393	61	59	No
10:00 - 11:00	159		214		373	56	53	No

Traffic Engineering Consultants, Inc.

T-2525 OK Heart Hospital South

Projected 2026 Total Traffic

Study Name: SH 4 and Fox Rd 2019 Traffic

Study Date : 4/25/2019

Warrant 1B - Interruption of Continuous Traffic

Description

Intended for sites where the volume of the major street is so heavy that traffic on the minor street suffers excessive delay or hazard.

Summary

Only 4 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply = **True**
Number of Major Lanes = **2 or more**
Number of Minor Lanes = **1**

Volume Requirements

Rural Factor of 70 % applied
Veh/Hr Major = **630**

Veh/Hr Minor = **52**

	Major Road SH 4					Minor Road Fox Rd		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
16:00 - 17:00	381	+	528	=	909	77	87	Yes
15:00 - 16:00	316	+	478	=	794	67	128	Yes
06:00 - 07:00	338	+	349	=	687	168	131	Yes
14:00 - 15:00	286	+	357	=	643	58	110	Yes
17:00 - 18:00	216	+	353	=	569	42	61	No
17:15 - 18:15	216	+	353	=	569	42	61	No
17:30 - 18:30	216	+	353	=	569	42	61	No
17:45 - 18:45	216	+	353	=	569	42	61	No
07:00 - 08:00	207	+	309	=	516	71	117	No
07:15 - 08:15	207	+	309	=	516	71	117	No
07:30 - 08:30	207	+	309	=	516	71	117	No
07:45 - 08:45	207	+	309	=	516	71	117	No
05:00 - 06:00	260	+	221	=	481	93	102	No
05:15 - 06:15	260	+	221	=	481	93	102	No
05:30 - 06:30	260	+	221	=	481	93	102	No
05:45 - 06:45	260	+	221	=	481	93	102	No
13:00 - 14:00	208	+	244	=	452	38	56	No
13:15 - 14:15	208	+	244	=	452	38	56	No
13:30 - 14:30	208	+	244	=	452	38	56	No
13:45 - 14:45	208	+	244	=	452	38	56	No
08:00 - 09:00	158	+	235	=	393	61	59	No
08:15 - 09:15	158	+	235	=	393	61	59	No
08:30 - 09:30	158	+	235	=	393	61	59	No
08:45 - 09:45	158	+	235	=	393	61	59	No
10:00 - 11:00	159		214		373	56	53	No

Traffic Engineering Consultants, Inc.

T-2525 OK Heart Hospital South

Projected 2026 Total Traffic

Study Name: SH 4 and Fox Rd 2019 Traffic

Study Date : 4/25/2019

Warrant 1C Combination of Warrants

Description

Intended for sites where the traffic volumes don't meet individual warrants but where Warrants 1A and 1B are both met to 80% of their stated values.

Summary

Only 6 hours meet 1A minimums.
Only 6 hours meet 1B minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply =	**True**
Number of Major Lanes =	**2 or more**
Number of Minor Lanes =	**1**

Volume Requirements

Rural Factor of 70% applied

Warrant	1A	1B
Veh/Hr Major =	**336**	**504**
Veh/Hr Minor =	**84**	**42**

Major Road	Minor Road
SH 4	Fox Rd

Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met1A?
16:00 - 17:00	381	+	528	=	909	77	87	Yes
15:00 - 16:00	316	+	478	=	794	67	128	Yes
06:00 - 07:00	338	+	349	=	687	168	131	Yes
14:00 - 15:00	286	+	357	=	643	58	110	Yes
07:00 - 08:00	207	+	309	=	516	71	117	Yes
05:00 - 06:00	260	+	221	=	481	93	102	Yes
17:00 - 18:00	216	+	353	=	569	42	61	No
17:15 - 18:15	216	+	353	=	569	42	61	No
17:30 - 18:30	216	+	353	=	569	42	61	No
17:45 - 18:45	216	+	353	=	569	42	61	No
13:00 - 14:00	208	+	244	=	452	38	56	No
13:15 - 14:15	208	+	244	=	452	38	56	No

Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met1B?
16:00 - 17:00	381	+	528	=	909	77	87	Yes
15:00 - 16:00	316	+	478	=	794	67	128	Yes
06:00 - 07:00	338	+	349	=	687	168	131	Yes
14:00 - 15:00	286	+	357	=	643	58	110	Yes
17:00 - 18:00	216	+	353	=	569	42	61	Yes
07:00 - 08:00	207	+	309	=	516	71	117	Yes
05:00 - 06:00	260	+	221	=	481	93	102	No
05:15 - 06:15	260	+	221	=	481	93	102	No
05:30 - 06:30	260	+	221	=	481	93	102	No
05:45 - 06:45	260	+	221	=	481	93	102	No
13:30 - 14:30	208	+	244	=	452	38	56	No
13:45 - 14:45	208	+	244	=	452	38	56	No

Traffic Engineering Consultants, Inc.

T-2525 OK Heart Hospital South

Projected 2026 Total Traffic

Study Name: SH 4 and Fox Rd 2019 Traffic

Study Date : 4/25/2019

Warrant 2 - Four Hour Volumes

Description

Intended for sites where the volume of intersecting traffic during any four hours of the day is the principal reason for consideration of a signal installation.

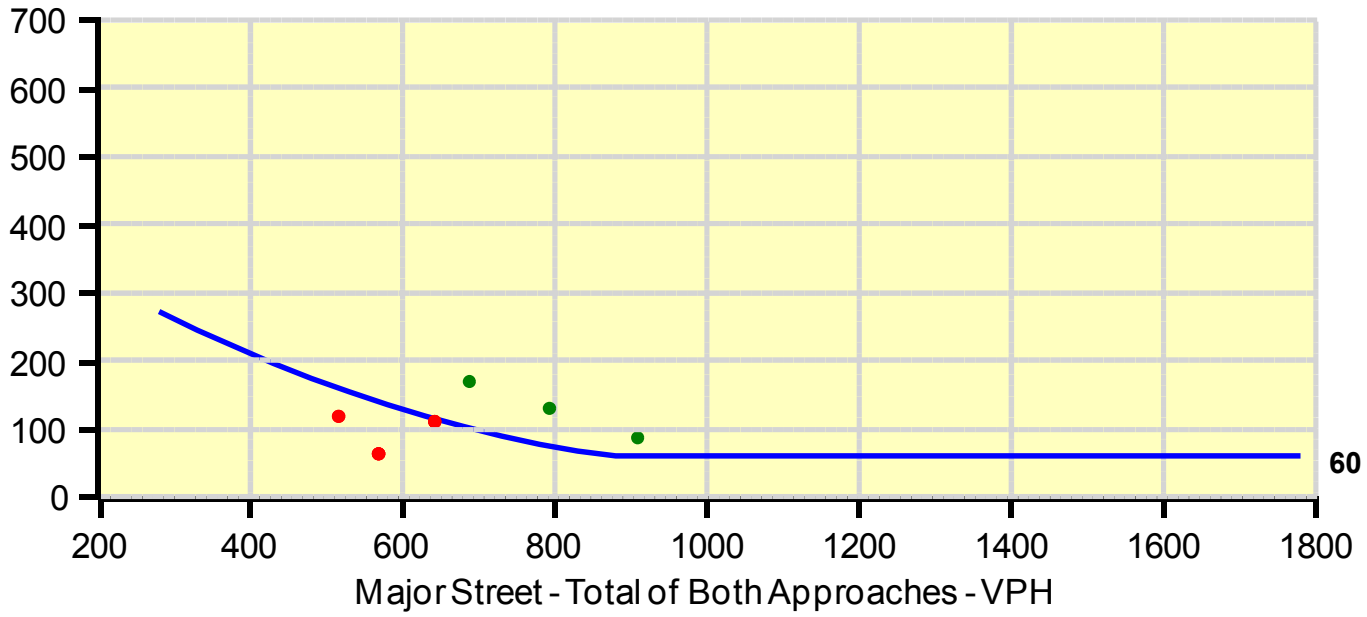
Summary

Only 3 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply =	**True**
Number of Major Lanes =	**2 or more**
Number of Minor Lanes =	**1**

	Major Road SH 4					Minor Road Fox Rd		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
16:00 - 17:00	381	+	528	=	909	77	87	Yes
15:00 - 16:00	316	+	478	=	794	67	128	Yes
06:00 - 07:00	338	+	349	=	687	168	131	Yes
14:30 - 15:30	286	+	357	=	643	58	110	No
14:45 - 15:45	286	+	357	=	643	58	110	No
14:00 - 15:00	286	+	357	=	643	58	110	No
14:15 - 15:15	286	+	357	=	643	58	110	No
17:30 - 18:30	216	+	353	=	569	42	61	No
17:45 - 18:45	216	+	353	=	569	42	61	No
17:00 - 18:00	216	+	353	=	569	42	61	No
17:15 - 18:15	216	+	353	=	569	42	61	No



Traffic Engineering Consultants, Inc.

T-2525 OK Heart Hospital South

Projected 2026 Total Traffic

Study Name: SH 4 and Fox Rd 2019 Traffic

Study Date : 4/25/2019

Warrant 3A - Peak Hour Delay

Description

Intended for sites where for one hour of the day minor street traffic suffers undue traffic delay entering or crossing the major street.

Summary

16 one hour periods meet minimums.
Warrant IS met.

Site Data Required

Number of Minor Lanes = **1**

Volume and Delay Requirements

Veh/Hr All Approaches = **800**
Veh/Hr Minor = **100**
Total Delay (Veh-Hrs) = **4**

	Major Road					Minor Road			
	SH 4					Fox Rd			
Time	Total of All Approaches	Met?	Minor EB	Delay EB	Met?	Minor WB	Delay WB	Met?	Warrant Met?
15:00 - 16:00	989	Yes	67	-	---	128	-	Yes	Yes
15:15 - 16:15	989	Yes	67	-	---	128	-	Yes	Yes
15:30 - 16:30	989	Yes	67	-	---	128	-	Yes	Yes
15:45 - 16:45	989	Yes	67	-	---	128	-	Yes	Yes
06:00 - 07:00	986	Yes	168	-	Yes	131	-	---	Yes
06:15 - 07:15	986	Yes	168	-	Yes	131	-	---	Yes
06:30 - 07:30	986	Yes	168	-	Yes	131	-	---	Yes
06:45 - 07:45	986	Yes	168	-	Yes	131	-	---	Yes
14:00 - 15:00	811	Yes	58	-	---	110	-	Yes	Yes
14:15 - 15:15	811	Yes	58	-	---	110	-	Yes	Yes
14:30 - 15:30	811	Yes	58	-	---	110	-	Yes	Yes
14:45 - 15:45	811	Yes	58	-	---	110	-	Yes	Yes
16:00 - 17:00	1073	Yes	77	-	---	87	-	No	No
16:15 - 17:15	1073	Yes	77	-	---	87	-	No	No
16:30 - 17:30	1073	Yes	77	-	---	87	-	No	No
16:45 - 17:45	1073	Yes	77	-	---	87	-	No	No
07:00 - 08:00	704	No	71	-	---	117	-	Yes	No
07:15 - 08:15	704	No	71	-	---	117	-	Yes	No
07:30 - 08:30	704	No	71	-	---	117	-	Yes	No
07:45 - 08:45	704	No	71	-	---	117	-	Yes	No
05:00 - 06:00	676	No	93	-	---	102	-	Yes	No
05:15 - 06:15	676	No	93	-	---	102	-	Yes	No
05:30 - 06:30	676	No	93	-	---	102	-	Yes	No
05:45 - 06:45	676	No	93	-	---	102	-	Yes	No
17:00 - 18:00	672	No	42	-	---	61	-	No	No

Traffic Engineering Consultants, Inc.

T-2525 OK Heart Hospital South

Projected 2026 Total Traffic

Study Name: SH 4 and Fox Rd 2019 Traffic

Study Date : 4/25/2019

Warrant 3B - Peak Hour Volumes

Description

Intended for sites where the volume of intersecting traffic during one hour of the day is the principal reason for consideration of a signal installation.

Summary

Only 0 one hour periods meet minimums.
Warrant is NOT met.

Site Data Required

Rural Settings Apply =	**True**
Number of Major Lanes =	**2 or more**
Number of Minor Lanes =	**1**

	Major Road SH 4					Minor Road Fox Rd		
Time	Major NB	+	Major SB	=	Total	Minor EB	Minor WB	Met?
16:00 - 17:00	381	+	528	=	909	77	87	No
16:45 - 17:45	381	+	528	=	909	77	87	No
16:15 - 17:15	381	+	528	=	909	77	87	No
16:30 - 17:30	381	+	528	=	909	77	87	No
15:45 - 16:45	316	+	478	=	794	67	128	No
15:00 - 16:00	316	+	478	=	794	67	128	No
15:15 - 16:15	316	+	478	=	794	67	128	No
15:30 - 16:30	316	+	478	=	794	67	128	No
06:45 - 07:45	338	+	349	=	687	168	131	No
06:00 - 07:00	338	+	349	=	687	168	131	No
06:15 - 07:15	338	+	349	=	687	168	131	No