

ALTERNATIVES ANALYSIS FOR MODIFICATION OF US-377/SH-22 INTERSECTION JP 36178(07)

Prepared for:

OKLAHOMA DEPARTMENT OF TRANSPORTATION

DRAFT

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1.0 INTRODUCTION

This memorandum documents the analysis procedure and findings for four alternative configurations for the intersection of US-377 and SH-22 in Tishomingo, Oklahoma. The existing intersection is a wye configuration with free-flowing traffic along the major movements and stop control for the intersecting legs minor movements. This wye layout dates to the mid-1900s with numerous access reconfigurations through the middle of the wye over the years. In March 2022, there was a tragic fatal accident involving six teenage girls. The car carrying the six teens was turning left from a stop control on SH-22 onto the free-flowing leg of US-377 when it collided with a tractor-trailer traveling southbound. Based on the most recent collision data from 2017 to 2021, most crashes at this intersection were caused by failure to yield and driver inattention. Following the March 2022 accident, the Oklahoma Department of Transportation (ODOT) implemented additional safety measures at this location by reducing the posted speed limit from 50 mph to 45 mph, restriping the pavement markings, adding rumble strips in advance of the stop signs, and installing flags on the stop ahead signs to help catch drivers' attention. This intersection is included in ODOT's eight-year work program and Freese and Nichols, Inc. (FNI) has been contracted to analyze the intersection to help ODOT and the City of Tishomingo determine the future configuration. The following memo describes the alternative configurations and evaluation methodology which will be used in the development of a preferred alternative.

1.1 ALTERNATIVES ANALYSIS

Below are the four alternative configurations evaluated per the scope of the study:

- No-Build
- Alternative 1: Four-legged Intersection
- Alternative 2: Tee Intersection
- Alternative 3: Roundabout

Each alternative listed above was analyzed with respect to traffic considerations, safety considerations, access management, land use impacts, drainage impacts, utility impacts and overall comparative costs. The three build alternatives were initially developed for analysis based on what would best fit the area geometrically. Then, using the traffic operations analysis and safety considerations, the alternatives were refined for optimum lane configuration. Figures showing the conceptual designs for each alternative are in **Appendix A**. For this analysis, it was assumed that all crossing gravel paths within the existing wye configuration will be removed in each alternative.

1.1.1 No-Build

The No-build configuration is shown in **Figure 1** and the approach details are discussed below.



Figure 1 – No-Build Configuration

At the intersection of SH-22 and Wrecker Road, SH-22 is free-flowing and Wrecker Road is stop-controlled with no right turns allowed onto SH-22. At the intersection of SH-22 and Western Avenue, SH-22 is free-flowing while Western Avenue is stop-controlled. At the intersection of SH-22, US-377 and Ray Branum Road, US-377 is free-flowing with no left turns allowed on the northbound leg, and SH-22 and Ray Branum Road are both stop-controlled. At the intersection of US-377 and Wrecker Road, US-377 is free-flowing and Wrecker Road is yield-controlled with no left turns allowed onto US-377. There are varying routes currently crossing through the middle of the wye creating additional conflict points throughout the intersection.

1.1.2 Alternative 1 – Four-Legged Intersection

The lane configuration for Alternative 1 is shown in **Figure 2** and the approach details are discussed below.



Figure 2 – Alternative 1 – Four-Legged Intersection

At the intersection of SH-22, US-377 and Western Avenue, the southern leg of US-377 would be realigned to create a four-legged intersection at Western Avenue with all movements allowed. The intersection of US-377 and Ray Branum Road would be a tee intersection with US-377. This alternative would remove Wrecker Road and driveway connections to SH-22 and US-377 would be made. An access road along the northern side of SH-22 west of Western Avenue would provide driveway consolidation opportunities. Access management details can be found in Section 4.0.

1.1.3 Alternative 2 – Tee Intersection

The lane configuration for Alternative 2 is shown in **Figure 3** and the approach details are discussed below.



Figure 3 – Alternative 2 – Tee Intersection

Alternative 2 would realign SH-22 to create a new tee intersection with US-377. Teeing US-377 into SH-22 was considered but determined to not be a viable alternative due to the higher through traffic volumes along US-377 at this junction. The existing pavement of SH-22 from Western Avenue east to the existing intersection with US-377 would be removed and the remnant of the realigned SH-22 would be repurposed as realigned Western Avenue providing access for multiple driveways before intersecting SH-22 at a tee intersection. Wrecker Road would be removed entirely and driveway connections to SH-22 and US-377 would be made.

1.1.4 Alternative 3 – Roundabout

The lane configuration for Alternative 3 is shown in **Figure 4** and the approach details are discussed below.



Figure 4 – Alternative 3 – Roundabout

The main intersection of SH-22 and US-377 would be realigned to form a three-legged, single-lane roundabout in the center of the existing wye intersection area with entrance legs aligned from tangents off the horizontal curves of SH-22 and US-377. There are bypass lanes shown on the north and east side of the roundabout to accommodate the heavy south to north and north to west movements. The roundabout would be designed to accommodate all truck traffic and associated movements. Public outreach and education would be important for smooth execution and transition if this is the preferred alternative. Western Avenue would also be realigned utilizing the existing pavement of SH-22 to create a tee intersection on SH-22 west of its existing location. The existing pavement of SH-22 from Western Avenue east to the existing intersection with US-377 would be removed as well as Wrecker Road. The intersection of Ray Branum Road would form a tee intersection at US-377.

2.0 TRAFFIC CONSIDERATIONS

The following sections describe the design traffic volumes, evaluation methodology, and a comparison of the anticipated traffic operations of the four alternatives.

2.1.1 Traffic Volumes for Analysis

Weekday 24-hour roadway vehicle classification and intersection turning movement counts were recorded on September 20, 2023. The raw traffic data was reviewed and approved by ODOT Traffic Division on November 28, 2023 and can be found in **Appendix G**. Volumes for the year 2046 were developed assuming a linear growth of 1.7% per year between the years 2023 and 2046. This average annual growth rate was developed by ODOT based on three sites on the east, west and south peripheries of the project. See **Appendix I** for a map with 2022 AADT, factor code volumes (FCV) of the site in and near the project, and minimum and maximum growth rates. The peak hour traffic volumes were balanced for the year 2023 and calculated for the year 2046 for the no-build alternative based on the approved turning movement counts and provided growth rate and are shown in **Figure 5** and **Figure 6**, respectively. These directional volumes were then reallocated to the reconfigured approaches for Alternatives 1, 2 and 3 for both 2023 and 2046 based on the new geometric configurations of each and can be found in **Figure 7** for Alternative 1 and **Figure 8** for Alternatives 2 and 3.

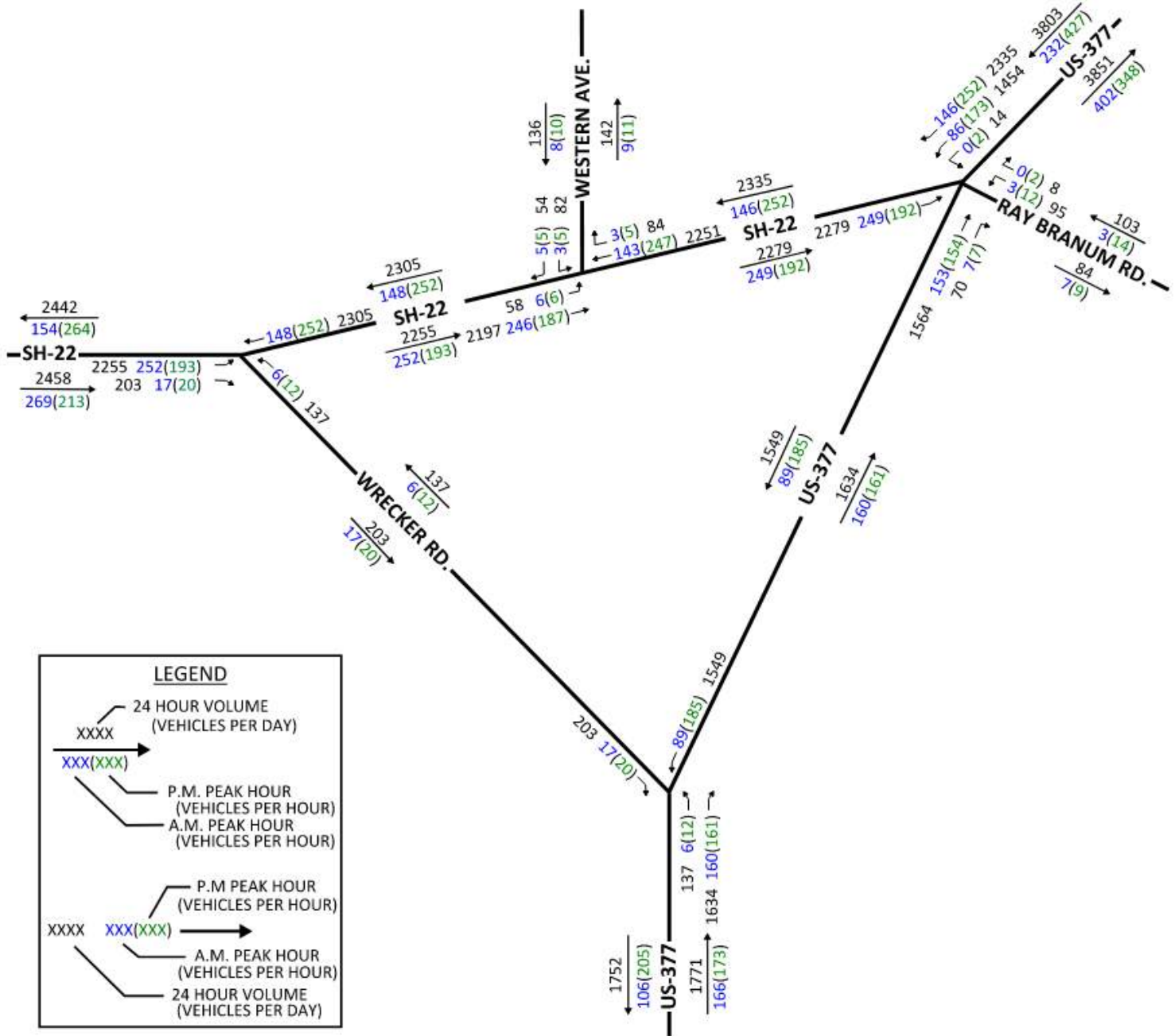


Figure 5 – 2023 Directional Traffic Volumes – No-Build

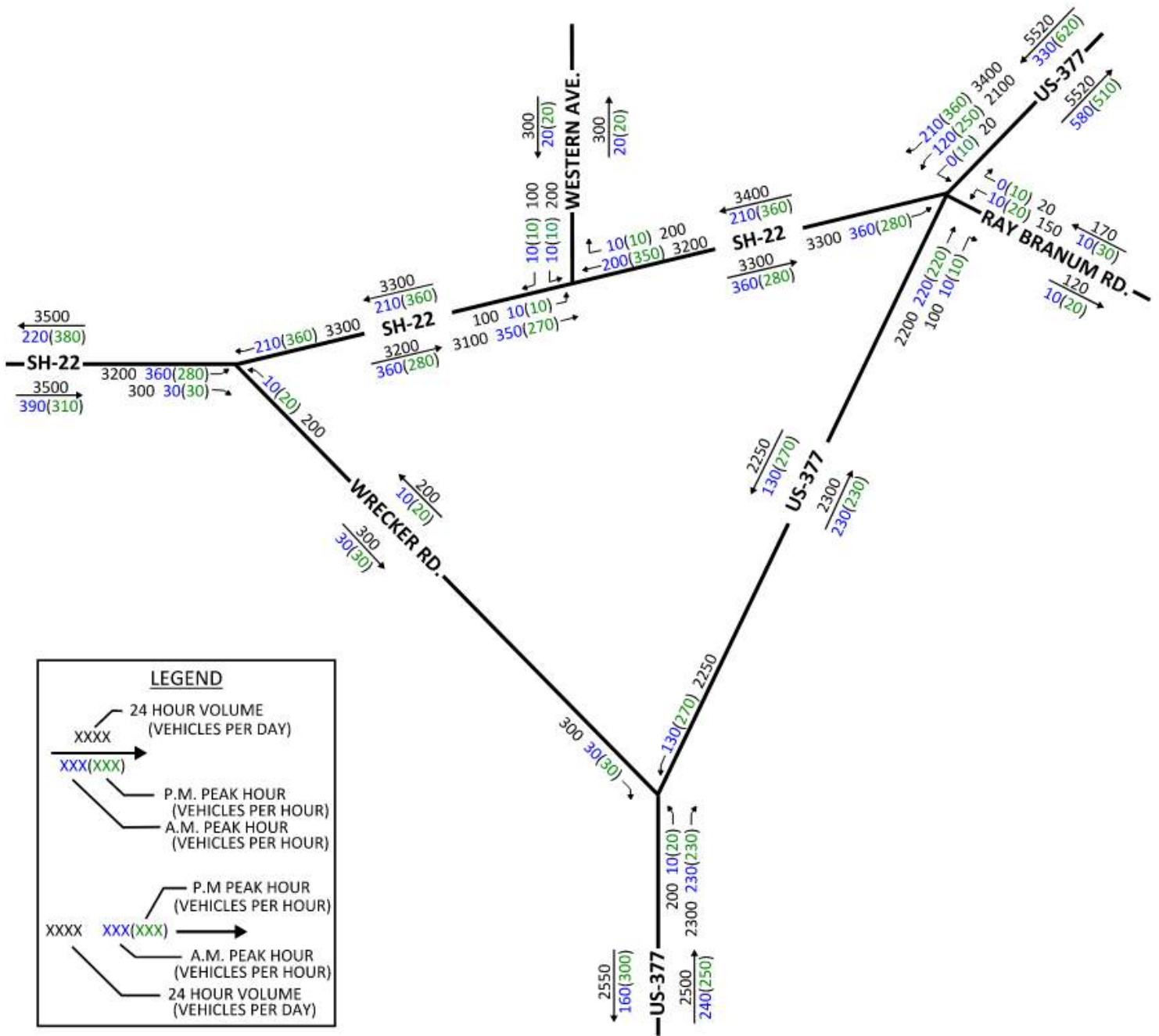


Figure 6 - 2046 Directional Traffic Volumes – No-Build

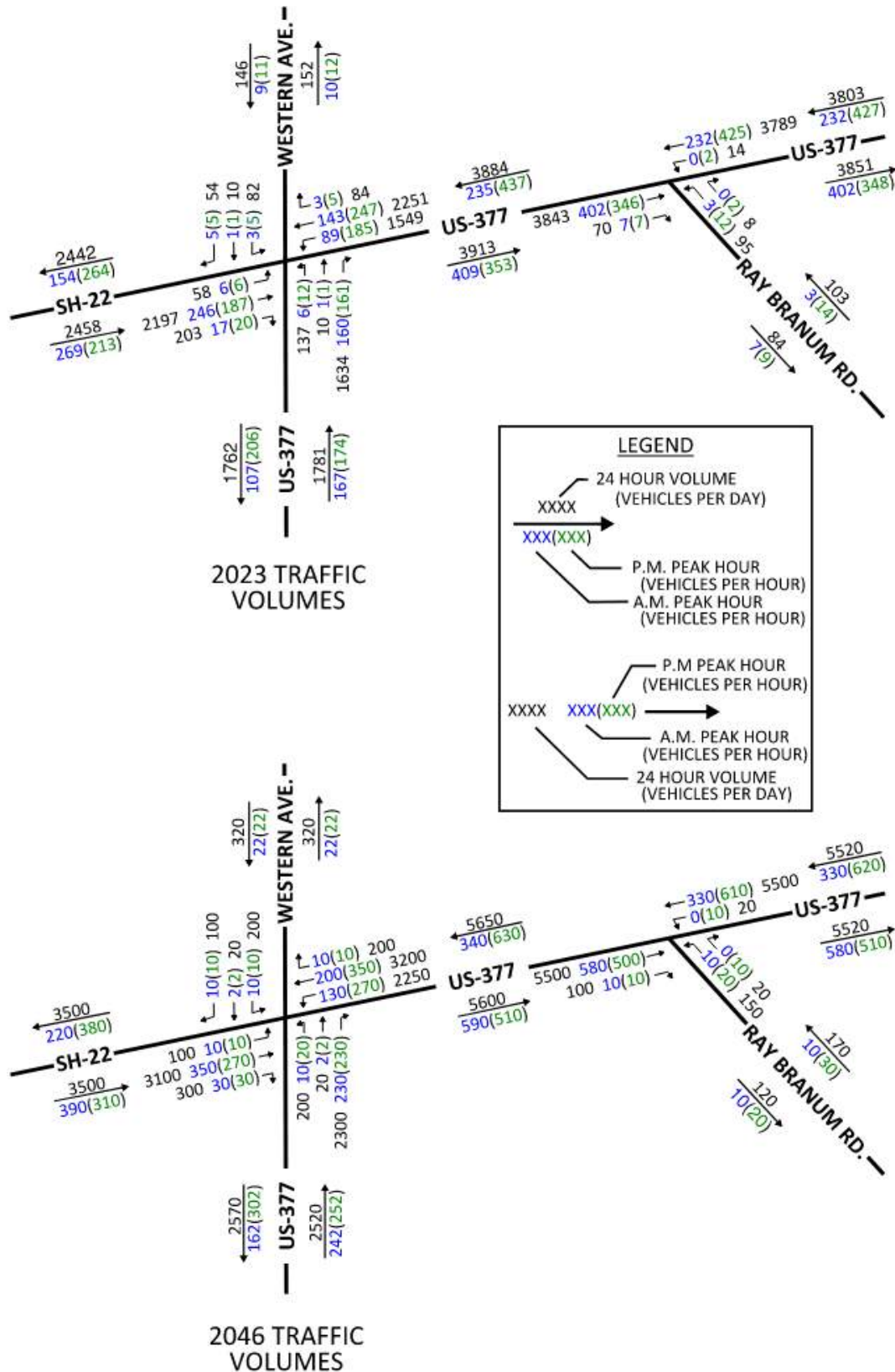


Figure 7 - 2023 & 2046 Directional Traffic Volumes – Alternative 1

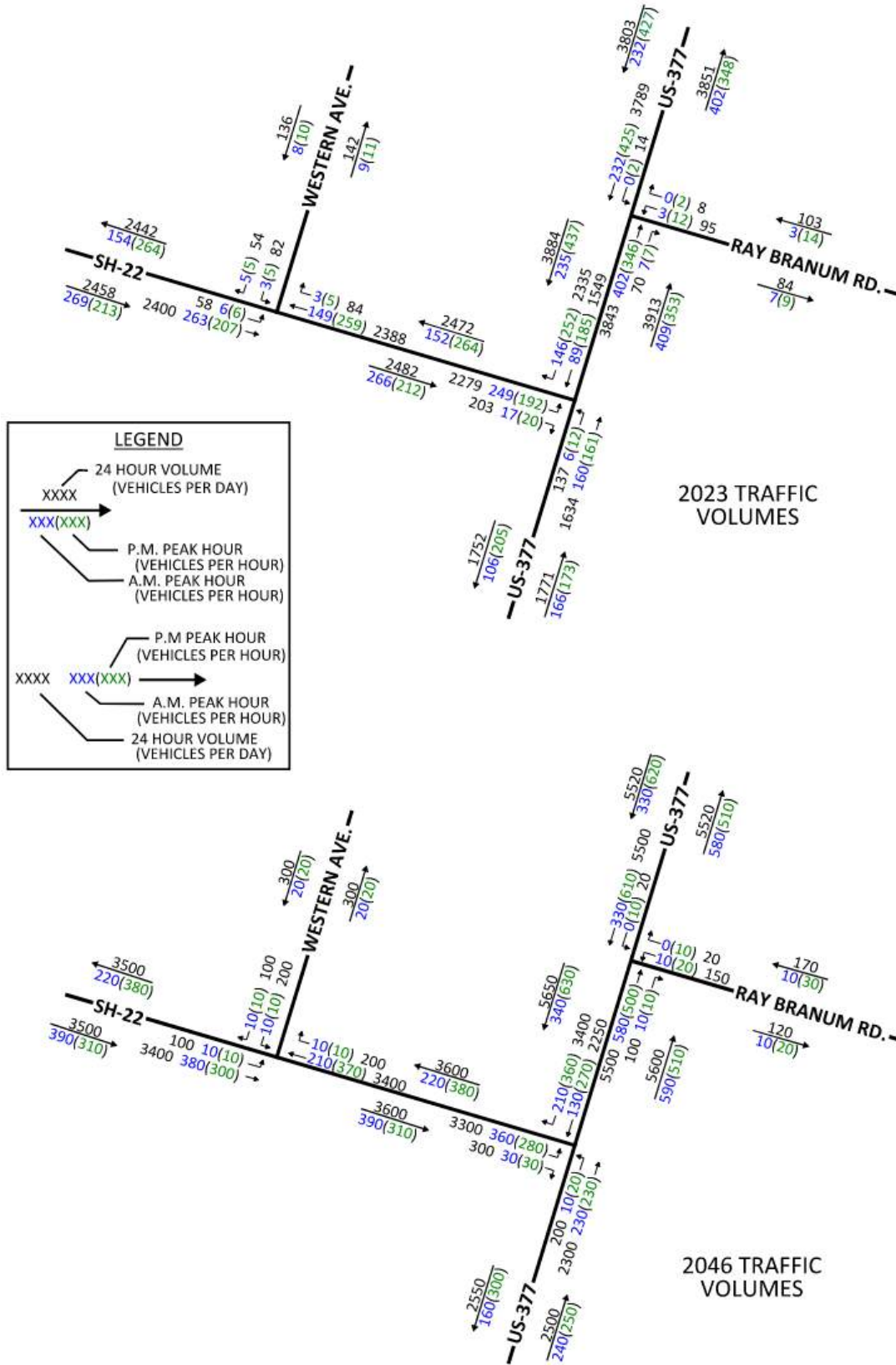


Figure 8 – 2023 & 2046 Directional Traffic Volumes - Alternatives 2 & 3

2.1.2 Traffic Analysis Methodology

The intersection analysis zone for the initial traffic operations comparison of the alternatives is shown in **Figure 9**. The analysis zone encompasses the limits along each of the five legs of the existing intersection that were included in the traffic operations analysis for each of the alternatives. The influence area includes length along each leg to capture the maximum queue lengths and the impacts on network delay in the traffic simulation models.



Figure 9 – Traffic Analysis Zone

The primary measure of effectiveness for initial comparison of the alternatives was the total hours of delay incurred by vehicles at each of the nodes of the alternatives within the analysis zone. Thus, the delay includes the cumulative delays of all nodes within the analysis zone: four nodes for the no-build, two nodes for Alternative 1 and three nodes for Alternatives 2 and 3. The assessment of delay values utilized the *Highway Capacity Manual (HCM) 6th Edition* methodology. Additional detailed review of level of service (LOS) and delay at each intersection was considered and those performance measures are discussed in Section 2.1.3.

A secondary measure of effectiveness for comparison of the alternatives was the identification of specific directional movements through the analysis zone that experience excessive delays or queues. These observations were used to refine the alternative configurations.

2.1.3 Performance Measures

Signalized Intersections

The *HCM 6th Edition* Chapter 19: Signalized Intersections describes the methodologies for estimating delay and defines the LOS criteria shown in **Table 1** for the average vehicle delay at signalized intersections.

Table 1 - Level of Service Criteria for Signalized Intersections

Performance Grade	Control Delay, seconds per vehicle
LOS A	0-10
LOS B	10-20
LOS C	20-35
LOS D	35-55
LOS E	55-80
LOS F	>80

Source: *HCM 6th Edition*, Exhibit 19-8

For signalized intersections, control delay can be computed for each directional movement, approach and the intersection as a whole using HCM equations to assess critical elements of the signalized intersection that need enhancement or reconfiguration. The methodologies of *HCM 6th Edition* are incorporated in the traffic modeling software, Synchro developed by Trafficware, which is used in the analyses for this effort.

Two-Way Stop-Controlled and All-Way Stop-Controlled Intersections

The *HCM 6th Edition* Chapter 20: Two-Way Stop-Controlled (TWSC) Intersections and Chapter 21: All-Way Stop-Controlled (AWSC) Intersections describe the methodologies for estimating delay and defines the LOS criteria shown in **Table 2** for the average vehicle delay at TWSC and AWSC intersections.

Table 2 - Level of Service Criteria for TWSC and AWSC Intersections

Performance Grade	Control Delay, seconds per vehicle
LOS A	0-10
LOS B	10-15
LOS C	15-25
LOS D	25-35
LOS E	35-50
LOS F	>50

Source: HCM 6th Edition, Exhibit 20-2 and Exhibit 21-8

For TWSC intersections, control delay can be computed for each minor-street movement (or shared movement), as well as the major-street left turns. LOS is not defined for the intersection as a whole because the major-street through vehicles are assumed to have zero delay and there is typically a disproportionately high volume of major-street vehicles skewing the weighted average. The methodologies of HCM 6th Edition are incorporated in Synchro which is used in the analyses for this effort.

Roundabouts

In a similar manner, HCM 6th Edition Chapter 22: Roundabouts describes the methodologies for estimating delay and defines the LOS criteria shown in **Table 3** for the average vehicle delay at roundabouts. Notably, the control delay ranges are different for roundabouts than for signalized intersections, with LOS degradation occurring at lower delay change intervals for roundabouts similar to other unsignalized intersections.

Table 3 - Level of Service Criteria for Roundabouts

Performance Grade	Control Delay, seconds per vehicle
LOS A	0-10
LOS B	10-15
LOS C	15-25
LOS D	25-35
LOS E	35-50
LOS F	>50 s/veh or v/c>1.0

Source: HCM 6th Edition, Exhibit 22-8

For roundabouts, control delay can be computed for each critical lane, approach and the intersection as a whole using HCM equations similar to TWSC and All-Way Stop-Controlled (AWSC) formulas with adjustments to account for yield control to assess critical elements of the roundabout that need enhancement or reconfiguration.

2.1.4 Traffic Performance Results

This section provides a summary of the traffic analysis results for each alternative discussing LOS and delay. Detailed Synchro Reports are included in **Appendix F**.

No-Build

The analysis of the no-build alternative was conducted using the existing lane configuration and intersection control. Wrecker Road is currently signed as a yield condition, but to analyze this intersection based on *HCM 6th Edition* it was analyzed as a stop control.

The analysis shows that if no intersection capacity improvements are made to the existing geometry, in the year 2046, the majority of the intersections would operate with LOS B and C on minor road approaches. It should be noted that for TWSC intersections, there is no overall intersection LOS as the major free-flowing leg is assumed to have zero delay for through traffic. One notable concern in both the AM and PM peak hours is the eastbound leg of the northeast intersection of SH-22 and US-377 would operate at a LOS F with approach delays of 55.8 and 227.3 sec/veh in AM and PM peak hours, respectively. This would be a high demand movement restricted by the free-flowing traffic along US-377. The individual approach, as well as the overall intersection delay and LOS for the no-build alternative, are presented in **Figure 10** and Synchro results are included in **Appendix F**.

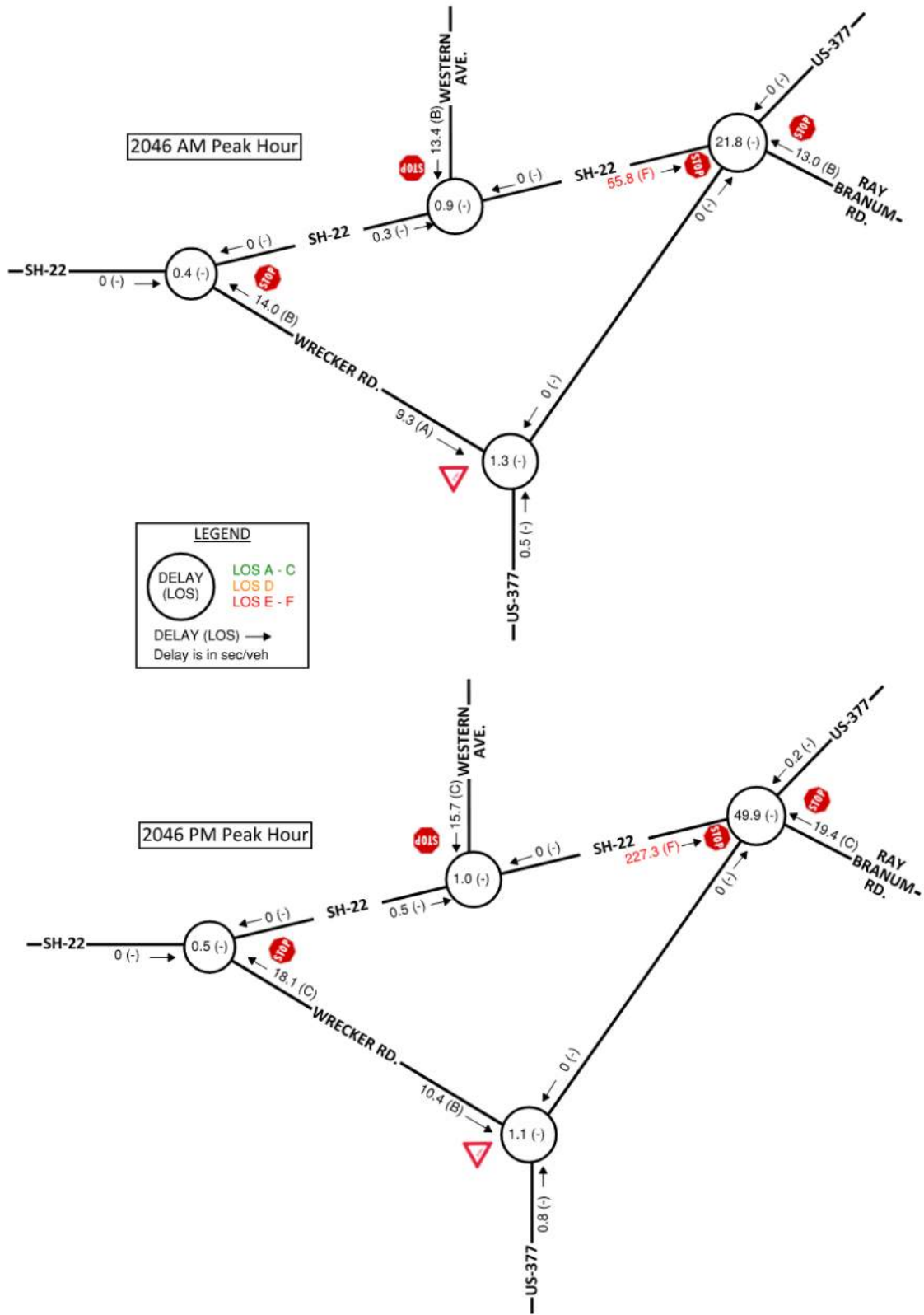


Figure 10 – Year 2046 Traffic Analysis Results - No-Build Alternative

Alternative 1 – Four-Legged Intersection

In 2046 with an optimized signal design, the intersection of SH-22, US-377 and Western Avenue would operate at a LOS A or B on all approaches with an overall intersection LOS A for both the AM and PM peak hours. Queue lengths would not be excessive. The intersection of US-377 and Ray Branum Road, being a TWSC intersection, would have no overall intersection LOS, but the overall intersection delay would be low due to the low volume of traffic on the side street. Average delay and LOS for each intersection in the 2046 AM and PM peak hours are shown below in **Figure 11** and Synchro results for 2023 and 2046 are included in **Appendix F**.

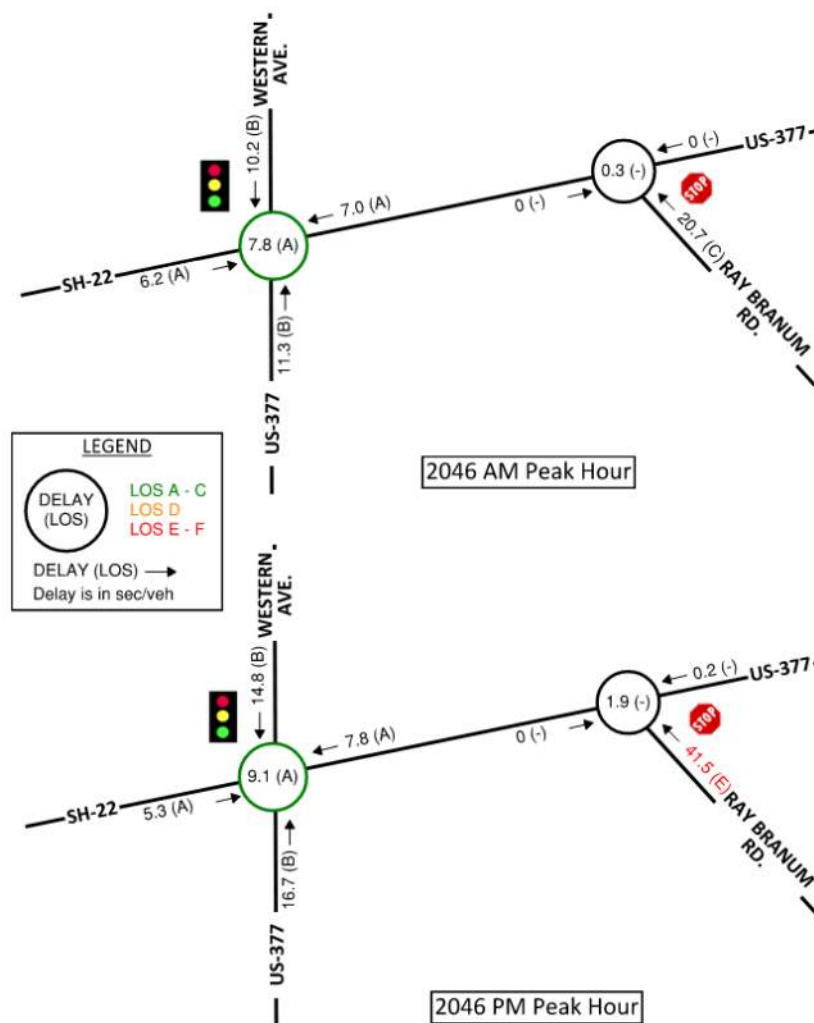


Figure 11 - Year 2046 Traffic Analysis Results - Alternative 1

In evaluating the most effective intersection configuration for Alternative 1, multiple scenarios were considered. **Figure 12** shows the average delay and LOS for the main intersection of SH-22, US-377 and

Western Avenue (Alternative 1A) if it were to be an unsignalized AWSC intersection. As shown, the approaches vary in operation from LOS B to LOS F with overall intersection LOS C and F for the 2046 AM and PM peak hours, with demand exceeding capacity in the 2046 PM peak hour traffic conditions.

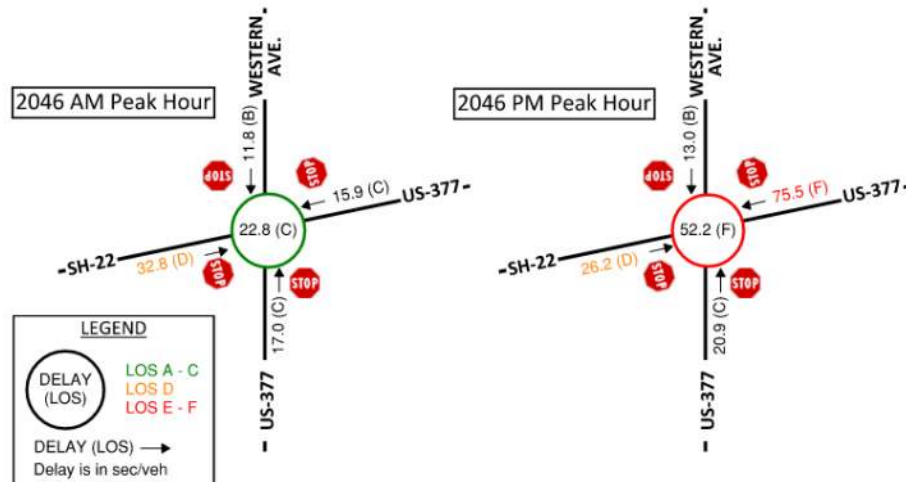


Figure 12 - Year 2046 Traffic Analysis Results - Alternative 1A

Alternative 2 – Tee Intersection

In 2046 with an optimized signalized design, the intersection of SH-22 and US-377 would operate at a LOS A or B on all approaches with an overall intersection LOS A for both the AM and PM peak hours. Queue lengths would not be excessive. With the intersection of US-377 and Ray Branum Road being a TWSC intersection, there would be no overall intersection LOS, but the approach for Ray Branum Road would operate at a LOS C and E in the AM and PM peak hours, respectively. Similarly, the intersection of SH-22 and Western Avenue would have no overall intersection LOS, but the approach for Western Avenue would operate at a LOS B and C in the AM and PM peak hours, respectively. Average delay and LOS for each intersection in the 2046 AM and PM peak hours are shown in **Figure 13** and Synchro results for 2023 and 2046 are included in **Appendix F**.

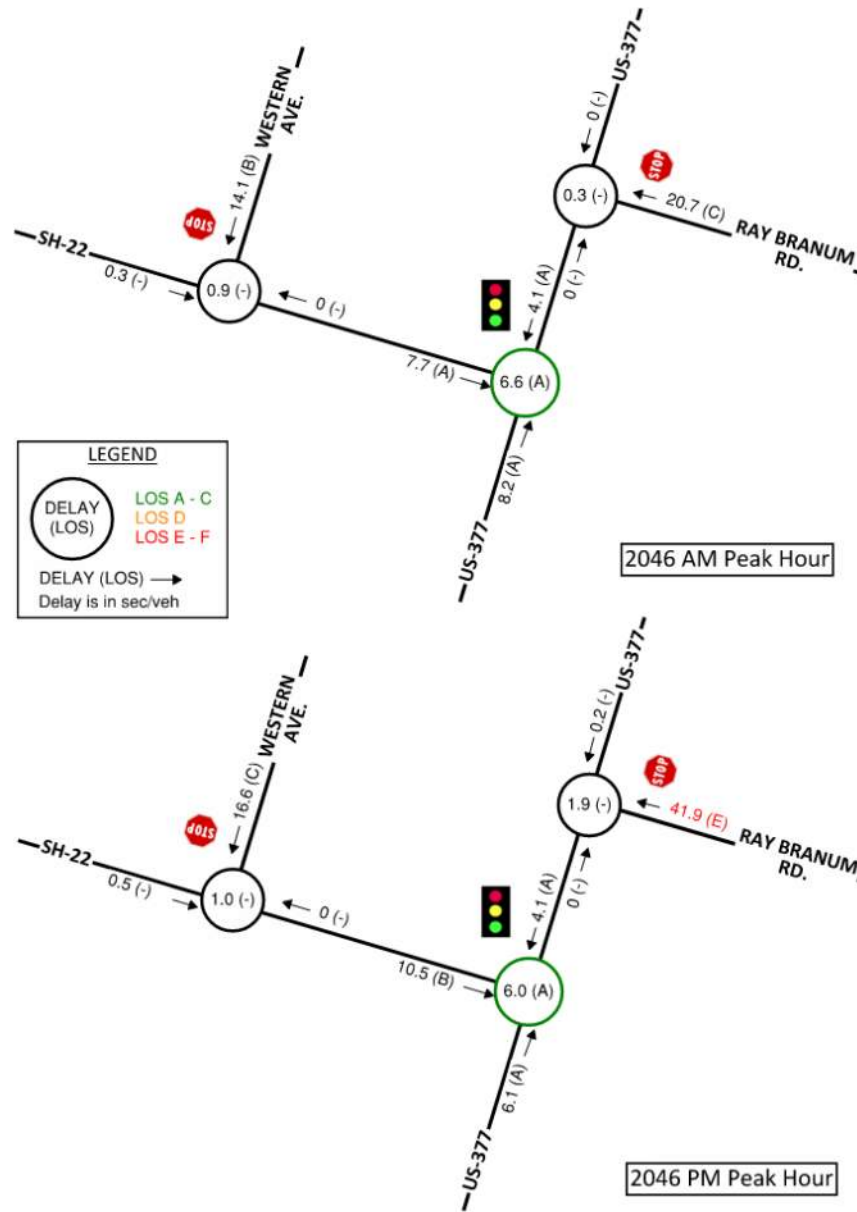


Figure 13 - Year 2046 Traffic Analysis Results - Alternative 2

Similar to Alternative 1, in evaluating the most effective intersection configuration for Alternative 2, multiple scenarios were considered. **Figure 14** shows the average delay and LOS for the main intersection of SH-22 and US-377 if it were an unsignalized AWSC intersection (Alternative 2A). As shown, the approaches would vary in operation from LOS B to E with overall intersection LOS C and D for the 2046 AM and PM peak hours, respectively. While Alternative 2A would operate better than Alternative 1A, there would be long delays for the stop-controlled approach and the signalized option (Alternative 2) would reduce overall delay.

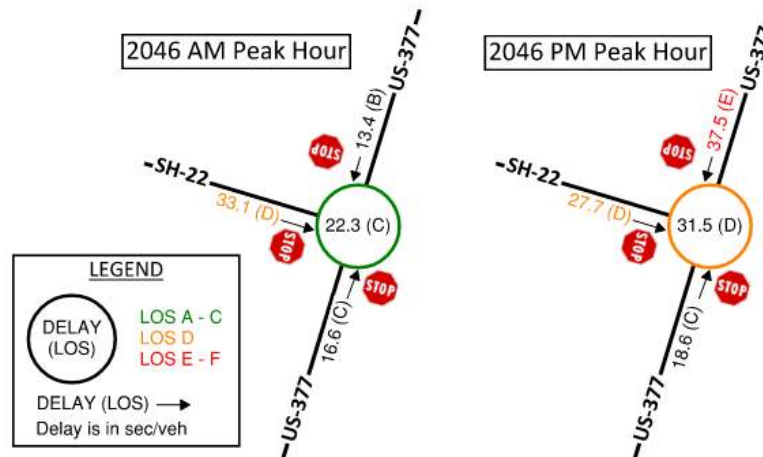


Figure 14 - Year 2046 Traffic Analysis Results - Alternative 2A

Alternative 3 - Roundabout

In 2046, the three-legged, single-lane roundabout with bypass lanes would operate at LOS A for all approaches and the overall intersection for both the AM and PM peak hours. With the intersection of US-377 and Ray Branum Road being a TWSC intersection, there would be no overall intersection LOS, but the approach for Ray Branum Road would operate at a LOS C and E in the AM and PM peak hours, respectively. Similarly, the intersection of SH-22 and Western Avenue would have no overall intersection LOS, but the approach for Western Avenue would operate at a LOS B and C in the AM and PM peak hours, respectively. Average delay and LOS for each intersection in the 2046 AM and PM peak hours are shown in **Figure 15** and Synchro results for 2023 and 2046 are included in **Appendix F**.

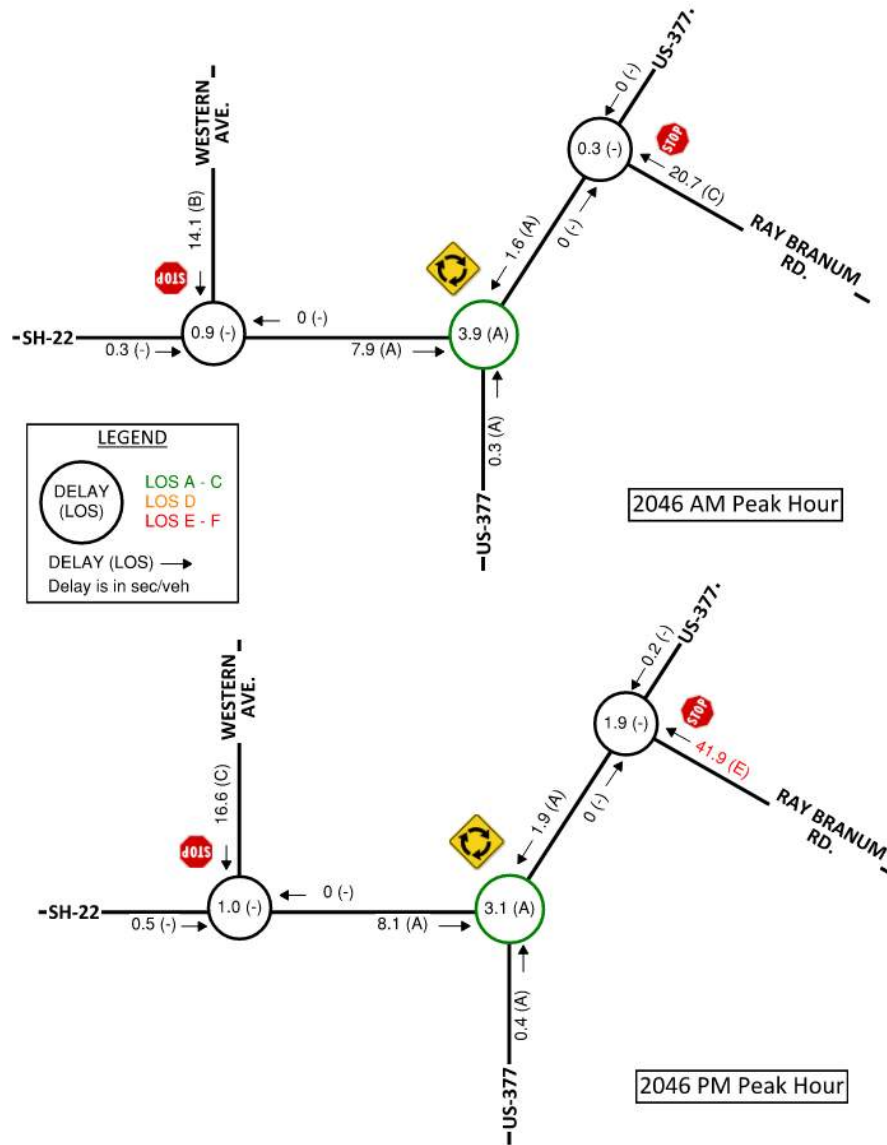


Figure 15 - Year 2046 Traffic Analysis Results - Alternative 3

When evaluating Alternative 3 for the most effective configuration, multiple roundabout options were considered. A single-lane, three-legged roundabout without bypass lanes (Alternative 3A), as well as a single-lane, four-legged roundabout (Alternative 3B) including Western Avenue as the northern fourth leg, were analyzed. Average delay and LOS for both Alternatives 3A and 3B in the 2046 AM and PM peak hours are shown in **Figure 16** and **Figure 17**, respectively. Both of these alternatives would operate at LOS B in the 2046 PM peak hour increasing the overall delay by 7 to 8 sec/veh. However, there are other advantages Alternative 3 would provide that Alternatives 3A and 3B would lack. The addition of bypass

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lanes would allow for two of the three heaviest movements to be fully removed from the circulating path, providing more gaps for the other movements to enter and traverse the roundabout. Allowing users to bypass the roundabout when traveling south to north or north to west would continue to provide free-flowing access for these movements that the traveling public has become accustomed to with the existing intersection configuration.

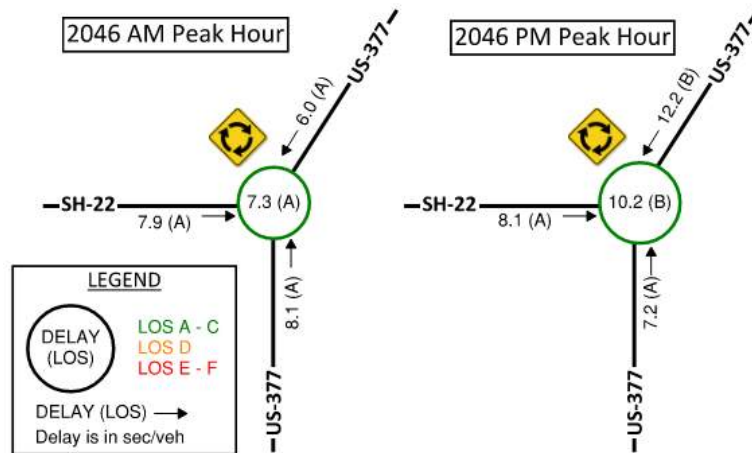


Figure 16 - Year 2046 Traffic Analysis Results - Alternative 3A

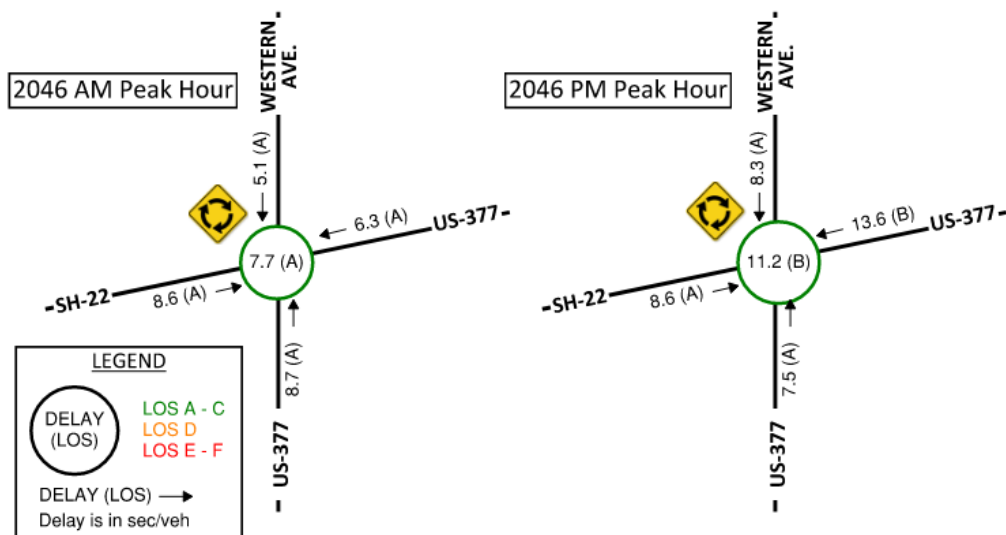


Figure 17 - Year 2046 Traffic Analysis Results - Alternative 3B

2.1.5 Summary of Overall Intersection Delay

In summary, all alternatives would be able to meet a LOS A in the 2046 peak hours in their most effective configuration with Alternative 3 offering the lowest overall intersection delay. **Table 4** below shows the delay in seconds per vehicle by intersection for each scenario.

Table 4 – Summary of Overall Intersection Delay in Peak Hour

Summary of Overall Intersection Delay in Peak Hour (sec/veh)				
Intersection	2023 AM	2023 PM	2046 AM	2046 PM
No-Build				
SH-22 and Wrecker Road	0.3	0.3	0.4	0.5
SH-22 and Western Avenue	0.5	0.6	0.9	1.0
US-377, SH-22 and Ray Branum Road	6.7	5.8	21.8	49.9
US-377 and Wrecker Road	1.1	1.0	1.3	1.1
Alternative 1 - Four-Legged Signalized				
SH-22, Western Avenue and US-377	6.3	6.5	7.8	9.1
US-377 and Ray Branum Road	0.1	0.7	0.3	1.9
Alternative 1A - Four-Legged AWSC				
SH-22, Western Avenue and US-377	12.1	15.6	22.8	52.2
US-377 and Ray Branum Road	0.1	0.7	0.3	1.9
Alternative 2 - Tee Signalized				
SH-22 and Western Avenue	0.5	0.6	0.9	1.0
SH-22 and US-377	5.9	5.5	6.6	6.0
US-377 and Ray Branum Road	0.1	0.7	0.3	1.9
Alternative 2A - Tee AWSC				
SH-22 and Western Avenue	0.5	0.6	0.9	1.0
SH-22 and US-377	12.4	12.9	22.3	31.5
US-377 and Ray Branum Road	0.1	0.7	0.3	1.9
Alternative 3 - Roundabout Three-Legged w/Bypass				
SH-22 and Western Avenue	0.5	0.6	0.9	1.0
SH-22 and US-377	2.7	2.3	3.9	3.1
US-377 and Ray Branum Road	0.1	0.7	0.3	1.9
Alternative 3A - Roundabout Three-Legged				
SH-22 and Western Avenue	0.5	0.6	0.9	1.0
SH-22 and US-377	5.4	6.6	7.3	10.2
US-377 and Ray Branum Road	0.1	0.7	0.3	1.9
Alternative 3B - Roundabout Four-Legged				
SH-22, Western Avenue and US-377	5.5	7.0	7.7	11.2
US-377 and Ray Branum Road	0.1	0.7	0.3	1.9

2.1.6 Total Delay Comparison

The total hours of delay incurred by vehicles at each of the nodes of the alternatives within the analysis zone were compared. The delay value includes the cumulative delays of all nodes within the analysis zone: four nodes for the no-build, two nodes for Alternative 1 and three nodes for Alternatives 2 and 3.

A comparison of total vehicle-hours of delay during peak hours for each alternative configuration is provided in **Table 5**, and graphically presented in **Figure 18**. Alternative 1 would experience the highest delay among the alternatives in the year 2023 as well as 2046. The overall delay for Alternative 3 single-lane roundabout with bypass lanes would be the lowest overall with very minor delay in the current year and 2046 peak hours. While all the optimized alternatives would experience minor overall peak hour delay, Alternative 3 would provide the best off-peak performance when compared to the other alternatives since vehicles would not be required to stop but instead yield, which would reduce delay for all approaches.

Table 5 – Summary of Total Peak Hour Delay

Alternative	Total Peak Hour Delay (veh-hr)			
	2023 AM	2023 PM	2046 AM	2046 PM
No-Build	1.33	1.56	5.87	18.19
Alternative 1	1.24	1.61	2.21	3.46
Alternative 2	1.15	1.41	1.94	2.56
Alternative 3	0.55	0.69	1.20	1.58

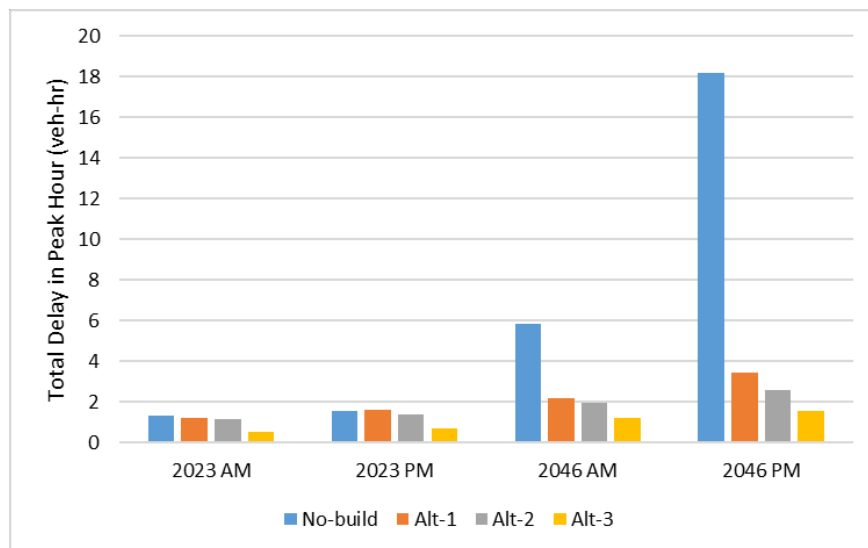


Figure 18 – Summary of Total Peak Hour Delay

2.1.7 Traffic Signal Warrants

FNI examined the need for traffic signals for Alternatives 1 and 2. The following sections examine each intersection and whether it meets the criteria contained in the *Manual on Uniform Traffic Control Devices (MUTCD) 2009 Edition* to warrant the installation of a traffic control signal.

Alternative 1 – Four-legged Intersection

The results of the signal warrant analysis for Alternative 1 are summarized in **Table 6**. See **Figure 2** for the lane configuration of this alternative.

The *MUTCD* states in Section 4C.01 that “the satisfaction of a warrant or warrants shall not in itself require the installation of a traffic control signal” and recommends that engineering judgment be used in the evaluation of the warrants to determine if a traffic signal will improve the overall traffic safety and/or operation of the intersection in question.

Table 6 – Traffic Signal Warrant Analysis for Alternative 1

Warrant	Traffic Signal Warrant Met
Warrant 1 - Eight-Hour Vehicular Volume	NO
Warrant 2 - Four-Hour Vehicular Volume	NO
Warrant 3 - Peak Hour	YES
Warrant 4 - Pedestrian Volume	N/A
Warrant 5 - School Crossing	N/A
Warrant 6 - Coordinated Signal System	N/A
Warrant 7 - Crash Experience	NO
Warrant 8 - Roadway Network	NO
Warrant 9 – Intersection near a Grade Crossing	N/A

The following are some observations regarding the traffic signal warrant analysis results for Alternative 1:

- Warrant 1 (Eight-Hour Vehicular Volume) was not met since there is not enough sustained traffic activity from the minor street approach on US-377.
- Warrant 2 (Four-Hour Vehicular Volume) was not met since there is not enough sustained traffic activity from the combined minor and major streets.
- Warrant 3 (Peak Hour Volume) was met under the evaluated traffic data for September 2023.
- Warrant 4 is not applicable for the intersection, since no existing crosswalk exists.

- Warrant 5 is not applicable for the intersection as school children would not typically cross at this location.
- Warrant 6 is not applicable for the intersection location because there are no adjacent traffic signal locations that would create a platooning conflict.
- Warrant 7 was not met since there was a maximum of four crashes in a 12-month period from 2017-2021 in the crash data that was provided.
- Warrant 8 was not met since the total volume through the intersection does not exceed 1,000 vehicles per day for any given hour.
- Warrant 9 is not applicable for the intersection location because there is no grade crossing and Warrant 3 was met.

Based on the traffic data collected in September 2023, Warrant 3 for traffic signal control at the proposed intersection of SH-22 and US-377/Western Avenue in Alternative 1 was met as described in the *MUTCD*, thus warranting traffic signal control at this location. In addition to meeting the criteria set for Peak Hour Volumes, a signalized intersection would help facilitate turning movements for each approach in this alternative.

Alternative 2 – Tee Intersection

The results of the warrant analysis for Alternative 2 are summarized in **Table 7**. See **Figure 3** for the layout of this alternative.

Table 7 – Traffic Signal Warrant Analysis Alternative 2

Warrant	Traffic Signal Warrant Met
Warrant 1 - Eight-Hour Vehicular Volume	NO
Warrant 2 - Four-Hour Vehicular Volume	NO
Warrant 3 - Peak Hour	YES
Warrant 4 - Pedestrian Volume	N/A
Warrant 5 - School Crossing	N/A
Warrant 6 - Coordinated Signal System	N/A
Warrant 7 - Crash Experience	NO
Warrant 8 - Roadway Network	NO
Warrant 9 – Intersection near a Grade Crossing	N/A

The following are some observations regarding the traffic signal warrant analysis results:

- Warrant 1 (Eight-Hour Vehicular Volume) was not met since there is not enough sustained traffic activity from the combined major street approaches on US-377.
- Warrant 2 (Four-Hour Vehicular Volume) was not met since there is not enough sustained traffic activity from the combined minor and major streets.
- Warrant 3 (Peak Hour Volume) was met under the evaluated traffic data for September 2023.
- Warrant 4 is not applicable for the intersection since no existing crosswalk exists.
- Warrant 5 is not applicable for the intersection as school children would not typically cross at this location.
- Warrant 6 is not applicable for the intersection location because there are no adjacent traffic signal locations that would create a platooning conflict.
- Warrant 7 was not met since there was a maximum of four crashes in a 12-month period from 2017-2021 in the crash data that was provided.
- Warrant 8 was not met since the total volume through the intersection does not exceed 1,000 vehicles per day for any given hour.
- Warrant 9 is not applicable for the intersection location because there is no grade crossing and Warrant 3 was met.

Based on the traffic data collected in September 2023, Warrant 3 for traffic signal control at the proposed intersection of SH-22 and US-377 for Alternative 2 was met as described in the *MUTCD*, thus warranting traffic signal control at this location. While safety remains the key concern for this proposed intersection, an analysis of the projected traffic volumes shows that Warrants 1 and 2 would be met in the years 2037 and 2030, respectively.

3.0 SAFETY CONSIDERATIONS

While traffic operations are a key measure of effectiveness of any intersection, given the lower traffic volumes of the area, all three build alternatives would provide adequate capacity. However, the alternatives differ when considering the safety aspects of each. This section provides a summary of the analysis in regard to collision data, conflict points, crash modification factors and qualitative safety measures.

3.1.1 Collision Data

Based on the most recent collision data from 2017 to 2021, there were seven total crashes at this intersection. Of these crashes, all were in daylight or dusk lighting conditions. There were two angle-turning, two rear-end, two right-angle and one with a culvert. Four of the seven crashes were caused by failure to yield, with the other three being due to inattention, unsafe speeds or following too closely. The full collision data report can be found in **Appendix H**.

While not included in the recent collision data from 2017 to 2021, there was a fatal accident at the intersection of US-377 and SH-22 in March 2022 where six teenagers were tragically lost. The car carrying the six teens was turning left from a stop control on SH-22 onto the free-flowing leg of US-377 when it collided with a tractor-trailer traveling southbound.

3.1.2 Conflict Points

To compare the various alternatives in regard to safety, conflict points were assessed for each alternative. Figures depicting the locations and type of conflict points can be seen in **Appendix C. Table 8** summarizes the conflict points for the existing configuration of the intersection and the three build alternatives. The No-Build and Alternative 2 options would have the lowest total number of conflict points. Alternative 3 would have the lowest number of crossing conflict points.

Table 8 – Summary of Conflict Points

Alternative	Intersection	Merge	Diverge	Cross	Total
No-Build	SH-22 and Wrecker Rd.	1	1	1	3
	Main St. and Western Ave.	3	3	3	9
	US-377 and Wrecker Rd.	1	1	1	3
	US-377 and Main St.	1	1	1	3
	Ray Branum Rd.	3	3	3	9
	Total for No-Build	9	9	9	27
Alternative 1	4 Leg Intersection	8	7	12	27
	Ray Branum Rd.	4	3	4	11
	Total for Alternative 1	12	10	16	38
Alternative 2	3 Leg Intersection	3	3	3	9
	Western Ave. Access Road	3	3	3	9
	Ray Branum Rd.	3	3	3	9
	Total for Alternative 2	9	9	9	27
Alternative 3	3 Leg Roundabout	5	5	0	10
	Western Ave. Access Road	3	3	3	9
	Ray Branum Rd.	3	3	3	9
	Total for Alternative 3	11	11	6	28

3.1.3 Crash Modification Factors

To further assess the safety of the various alternatives, crash mitigation strategies were considered from studies conducted on similar intersections. The crash modification factors (CMF) used as part of this analysis are based on information from the FHWA CMF Clearinghouse database. To be included in this assessment, CMFs had two-way stop-controlled existing conditions, similar AADT, and final intersection leg totals. While no specific CMFs were found for conversion from a multiple wye intersection to a signalized intersection or roundabout, the *FHWA Impact of Intersection Angle on Highway Safety* states that three-legged wye intersections have crash rates approximately 50% higher than tees. Given this data point, the safety impact any of these three alternatives will have is likely higher than the CMF and crash reduction factors shown below in **Table 9**.

Table 9 – Crash Modification Factors

Values	Alternative 1	Alternative 2	Alternative 3
Quality Rating Points*	120	112	85
Crash Modification Factor**	0.57	0.54	0.29
Crash Reduction Factor (%)***	43.1	45.9	71.0

* Defined by the FHWA Clearinghouse as the rating that indicates the quality or confidence in the results of the study producing the CMF. Factors that go into this rating are study design, sample size, statistical methodology, statistical significance, and other various items. Scores are decided using a rating system out of 150 total possible points.

** Defined by the FHWA Clearinghouse as the multiplicative factor used to compute the expected number of crashes after implementing a given countermeasure.

*** Defined by the FHWA Clearinghouse as the estimate of the percentage reduction in crashes due to a particular countermeasure.

3.1.4 Qualitative Safety Measures

Although no intersection configuration can eliminate collisions due to driver behavior, roundabouts have a proven safety record, especially in the rural setting. They have been shown to significantly reduce the severity and frequency of crashes, with most crashes being side-swipe and low impact as opposed to high-speed, broadside collisions. The largest concern with both stop-controlled and signal-controlled intersections is that they depend on passive compliance and are not designed to encourage reduced speeds through the intersection like the geometry a roundabout offers. The roundabout configuration of Alternative 3 would provide speed control geometrically through the deflected entries and center raised islands. The driver's focus on the roadway beyond would be interrupted by the roundabout, which would result in a traffic calming effect for through traffic on US-377.

Each alternative shows a curb and gutter section on the upstream side of all intersection legs which could promote traffic calming by giving the appearance of a more constrained roadway section. This design could increase driver awareness to a change in the corridor, even though there would be nothing physically requiring drivers to slow down. It could be beneficial to use transverse rumble strips and advanced warning signage with any alternative. Consideration of advanced signage options with LED lights to increase driver response or driver feedback signs displaying current speed of vehicles when exceeding the posted speed limit should be made. Enhanced roadway lighting at the intersection and upstream of each approach could bring further awareness to the intersection. Additionally, though the traffic volumes would be relatively low, left turn lanes could be added at the intersections of Ray Branum Road and Western Avenue for any alternative to move turning vehicles out of the main through travel lanes, which could reduce delay and minimize potential of rear-end collisions.

4.0 ACCESS MANAGEMENT

Access management is an important and defining element of each of the alternatives. As shown in **Appendix A**, a commonality in every alternative would be the removal of the various access roads in the center of the wye to reduce driver confusion and unnecessary conflict points. Each alternative would include the removal of Wrecker Road and its isolated single driveway entrance to Aggie Flats, a student housing complex for Murray State College. Aggie Flats would retain one access driveway location on SH-22. Below is a summary of the additional access management considerations for each alternative as shown in the alternative layouts in **Appendix A**.

Alternative 1 – Four-Legged Intersection

As depicted in **Figure 2**, directly adjacent to the proposed US-377 and SH-22 intersection location, a driveway access road would be provided just north of SH-22 to keep access points outside of the intersection area of influence. The use of the access road would reduce the number of conflict points at the intersection, decreasing the number of drives connecting to the mainline SH-22 from five to one. To accommodate the proposed access road and the realignment of Western Avenue, additional right-of-way would need to be acquired.

Similarly, along US-377, the Church of Christ would be losing its direct connection to US-377 and all traffic leaving and entering would need to use Ray Branum Road. With the connection to Ray Branum Road being close to the main intersection of US-377 and SH-22, it could be converted to a right-in, right-out to further enhance safety. Additionally, driveways to the west along SH-22 would be slightly shifted to align with one another.

Alternative 2 – Tee Intersection

As was depicted in **Figure 3**, Alternative 2 would provide condensed driveway access to SH-22 but differs from Alternative 1 in that it would incorporate the existing pavement from Main Street to maintain access to the driveways north of the wye and Western Avenue. The pavement east of Western Avenue up to US-377 would be removed to avoid driver confusion and reduce access points. If it is desired to provide an additional access point to Western Avenue, the intersection of US-377 at Ray Branum Road could be designed as a four-legged intersection, rather than a tee intersection, which would extent Ray Branum Road to connect with Western Avenue. One drive would be removed just west of the Western Avenue access point due to access to surrounding drives on both sides.

With this alternative, the Church of Christ would keep both driveways, but the access onto US-377 could be limited to right turns only to avoid crossing conflicts with southbound traffic entering the intersection.

Alternative 3 – Roundabout

As depicted in **Figure 4**, similar to Alternative 2, the roundabout layout would use portions of the existing pavement on Main Street to maintain access for drives to the north of SH-22. Since the west leg of the roundabout would carry a bypass lane for over 400 feet, SH-22 would need to be realigned to avoid the limits of the merging taper and connect to SH-22 at a 90° angle. No additional right-of-way would be anticipated for this connection and the existing pavement east of Western Avenue would be removed up to US-377 as well. If it is desired to provide an additional access point to Western Avenue, the intersection of US-377 at Ray Branum Road could be designed as a four-legged intersection, rather than a tee intersection, which would extent Ray Branum Road to connect with Western Avenue.

Along US-377, the Church of Christ would no longer have a direct connection to US-377 and all traffic leaving and entering would need to use Ray Branum Road. The private drive just south of the church would be realigned to connect to the south leg of the roundabout to avoid connecting to the eastbound bypass lane.

5.0 UTILITY IMPACTS

As shown in **Appendix B**, Alternatives 1 and 2 would be expected to require utility relocation along the east side of US-377 toward the south side of the project. Based on the impacts shown by preliminary design, effected utilities in this region would include underground telephone, fiber optic, overhead power, and water. The open area to the west side of the proposed alignments would allow for optimal relocation through coordination with franchise utility owners and the City of Tishomingo. Relocation to this side of the alignment would not require additional right-of-way on the east, minimizing the cost for ODOT.

If the utilities were to remain on the eastern side after relocation, approximately 35 feet of right-of-way would need to be purchased, assuming utility owners would not be willing to combine trenches. Other measures could be taken to reduce the limits of construction such as slightly realigning US-377 toward the center of the wye or lowering the profile with curb and gutter to maintain the existing ditch along the east side.

Alternative 3 would have the lowest impact on existing utilities because of the roundabout's use of the center wye. The most impacted utilities for this alternative would be the overhead powerlines running through the center of the project area. However, options for relocation of the overhead powerlines within the existing right-of-way would be likely.

All alternatives would cross the sanitary sewer line located in the center of the wye. However, the existing line is shown to be an 8-inch main with a depth of 7 to 8 feet. Given this depth, vertical profiles of all alternatives could be optimized to avoid conflict as much as possible. The waterlines surrounding the project limits on the north and west side do not appear to be impacted by the preliminary limits of construction.

6.0 LAND USE IMPACTS

Land use impacts were evaluated to gather a perspective on the proposed right-of-way needs and environmental considerations for each alternative.

6.1.1 Right-of-Way Needs

Based on study level conceptual layouts, Alternative 1 would require some permanent right-of-way to accommodate the Western Avenue adjustments on the north leg. Additionally, depending upon utility relocation negotiations as discussed in Section 5.0, permanent right-of-way could be required along the east side of US-377 for utility relocation although agreements could be made to relocate to the west side of US-377 to avoid right-of-way needs. In addition to some permanent right-of-way acquisition for Alternative 1, it could be necessary to obtain temporary construction easements and/or grading easements for Alternatives 2 and 3 for driveway access. The annotations located on the figures presented in this memo are conceptual in nature and upon initiation of design, the right-of-way needs will be assessed based on the preferred alternative. The alternatives, with existing and proposed right-of-way, are shown in **Appendix A**.

6.1.2 Environmental Considerations

Environmentally, the preliminary analysis indicates that there are no known significant adverse impacts within the footprint of the conceptual alternatives. During the regulatory report review for the hazardous materials study, three mapped sites were noted. One leaking petroleum storage tank record from the Oklahoma Corporation Commission (OCC) for The Station located 0.01 miles southeast of the study corridor. The record was closed on 8/20/2013 and appears to be of low concern. Two records listed underground storage tanks (UST) for The Station and the ODOT facility located 0.01 miles north of the study corridor. Three USTs listed for The Station are permanently out of use. Two USTs for the ODOT facility are listed as permanently out of use and two USTs are listed as currently in use. These records appear to be of low concern. The approximate locations of the storage tanks are shown in **Appendix E**.

7.0 DRAINAGE IMPACTS

Each alternative was analyzed based on its overall change in impervious area as that would affect runoff. The removal of Wrecker Road, in addition to the various roads in the center of the wye, would lead to significant reductions in impervious areas for all three proposed alternatives as summarized in **Table 10** below.

Table 10 – Summary of Impervious Area Changes

Alternative	Impervious Area % Change
Alternative 1	- 22.3
Alternative 2	- 29.8
Alternative 3	- 25.0

Since the existing alignments were closely followed while laying out these alternatives, it is expected that the existing roadside ditches will carry the remaining runoff for SH-22 and US-377 on Alternatives 1 and 2, respectively. The widening of the roadways to accommodate the proposed turn bays would require additional grading to maintain positive drainage. Alternative 3 would require additional grading of the center wye and ditches to serve the roundabout. Storm drain infrastructure or occasional curb cuts would be expected to be used to channel drainage within the curbed sections of each alternative.

A Waters of the U.S. Jurisdictional Stream (blue line stream) is located on the northeast corner of the wye, crossing near the existing intersection of SH-22 and US-377, north of Ray Branum Road. The impacts to this stream would be expected to be relatively minor since all alternatives could be designed to match the grade and width of the existing roadway at this location.

8.0 COST COMPARISON

Opinion of Probable Construction Costs (OPCC) were generated for each alternative and are included in **Appendix D**. The costs included general items, paving improvements, signalization and drainage improvements. All alternatives assumed the crossing roadways within the existing wye configuration would be removed and replaced with sod. It was also conservatively assumed that all paving would be removed and replaced for each alternative within the limits shown in the figures in **Appendix A**. Through detailed design, it may be possible to save some of the existing paving, but to account for the curb and gutter section, it was assumed that all would be fully replaced. The comparative costs also include a conservative 30% contingency and are summarized in **Table 11** below.

Table 11 – Cost Comparison Summary

Alternative	Construction Cost
Alternative 1 – Four-Legged Intersection	\$6,050,000
Alternative 2 – Tee Intersection	\$5,600,000
Alternative 3 - Roundabout	\$5,850,000

9.0 SUMMARY

Each of the alternatives would provide similar traffic operational benefits with minimal differences in respect to access management, drainage, environmental and right-of-way impacts. While any of the three alternatives would enhance safety, Alternative 3, with a single-lane roundabout, would not rely on passive compliance. As should be by the Crash Reduction Factors, Alternative 3 would be more beneficial as roundabouts have been shown to significantly reduce fatality and severe injury crashes versus tee and four-legged intersections by eliminating crossing conflict points. Alternative 3 also would have the lowest total delay per vehicle-hour and would have the best off-peak performance. Alternative 2 would reduce the impervious area slightly more than the other alternatives and has the lowest estimated construction cost. **Table 12** provides a summary comparison of each of the alternatives.

Table 12 – Summary of Alternatives

Alternative	Total 2046 Peak Hour Delay (veh-hr)		Crash Reduction Factor	Impervious Area	Estimated Construction Cost
	AM	PM		% Change	
Alternative 1 – Four-Legged Intersection	2.21	3.46	43.1%	-22.3%	\$6,050,000
Alternative 2 – Tee Intersection	1.94	2.56	45.9%	-29.8%	\$5,600,000
Alternative 3 - Roundabout	1.20	1.58	71.0%	-25.0%	\$5,850,000

**APPENDIX A
CONCEPTUAL LAYOUTS**



DESIGN	
DRAWN	
CHECKED	
APPROVED	
SQUAD	

OKLAHOMA DEPARTMENT OF TRANSPORTATION
 ROADWAY DESIGN DIVISION

**NO BUILD
 EXISTING LAYOUT**



LEGEND

- PRELIMINARY PROP. R/W AREA
- PAVEMENT REMOVAL/SODDING AREA
- PRELIMINARY TOC/TOS

DESIGN	
DRAWN	
CHECKED	
APPROVED	
SQUAD	

OKLAHOMA DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION

**ALTERNATIVE 1
FOUR-LEGGED INTERSECTION**



LEGEND

- PRELIMINARY PROP. R/W AREA
- PAVEMENT REMOVAL/SODDING AREA
- PRELIMINARY TOC/TOS

DESIGN	
DRAWN	
CHECKED	
APPROVED	
SQUAD	FREESE NICHOLS

OKLAHOMA DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION

**ALTERNATIVE 2
TEE INTERSECTION**



LEGEND

- PRELIMINARY PROP. R/W AREA
- PAVEMENT REMOVAL/SODDING AREA
- PRELIMINARY TOC/TOS

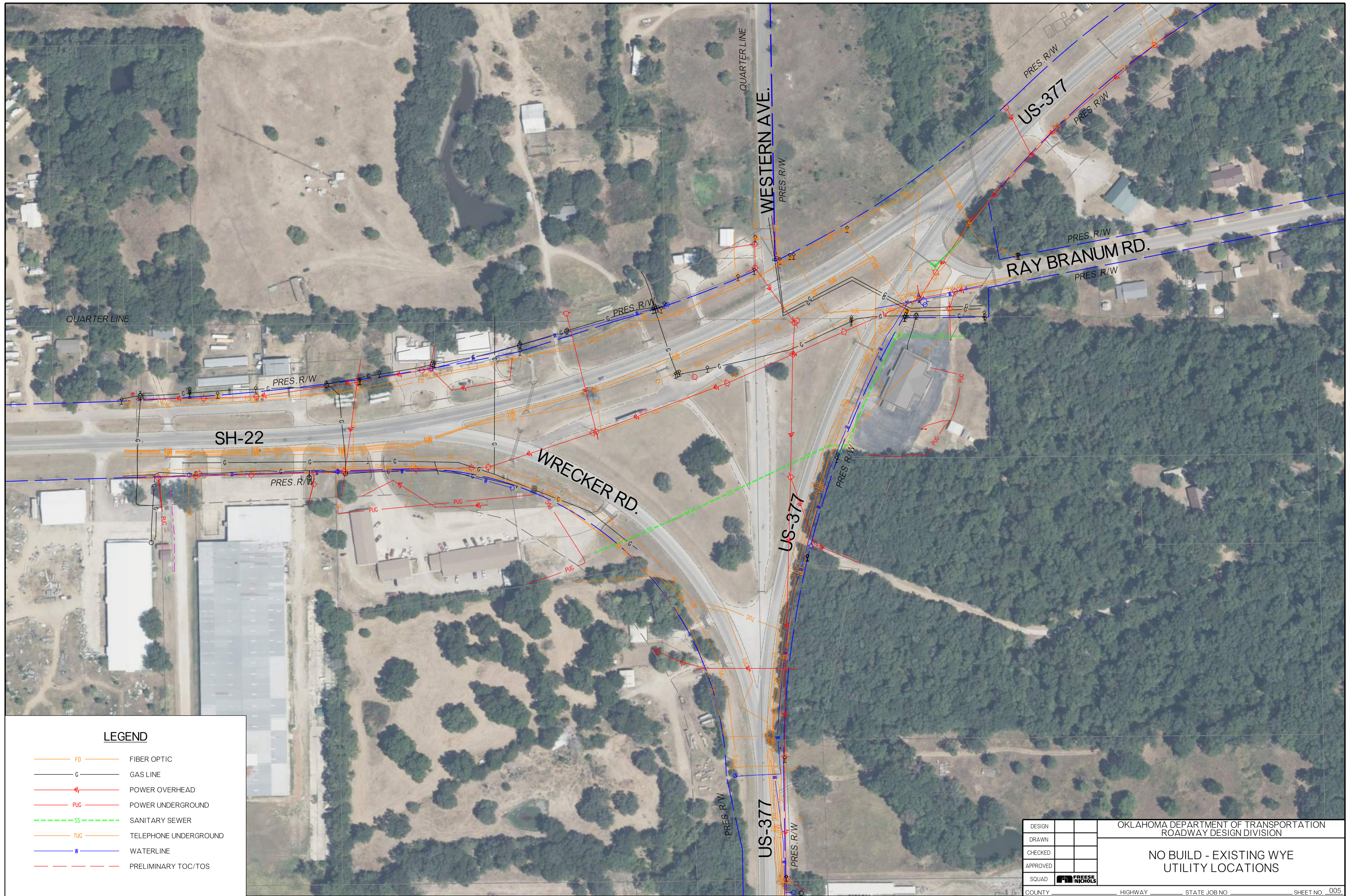
DESIGN	
DRAWN	
CHECKED	
APPROVED	
SQUAD	

OKLAHOMA DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION

**ALTERNATIVE 3
ROUNDABOUT**

COUNTY _____ HIGHWAY _____ STATE JOB NO. _____ SHEET NO. 004

APPENDIX B
UTILITY LAYOUTS



LEGEND

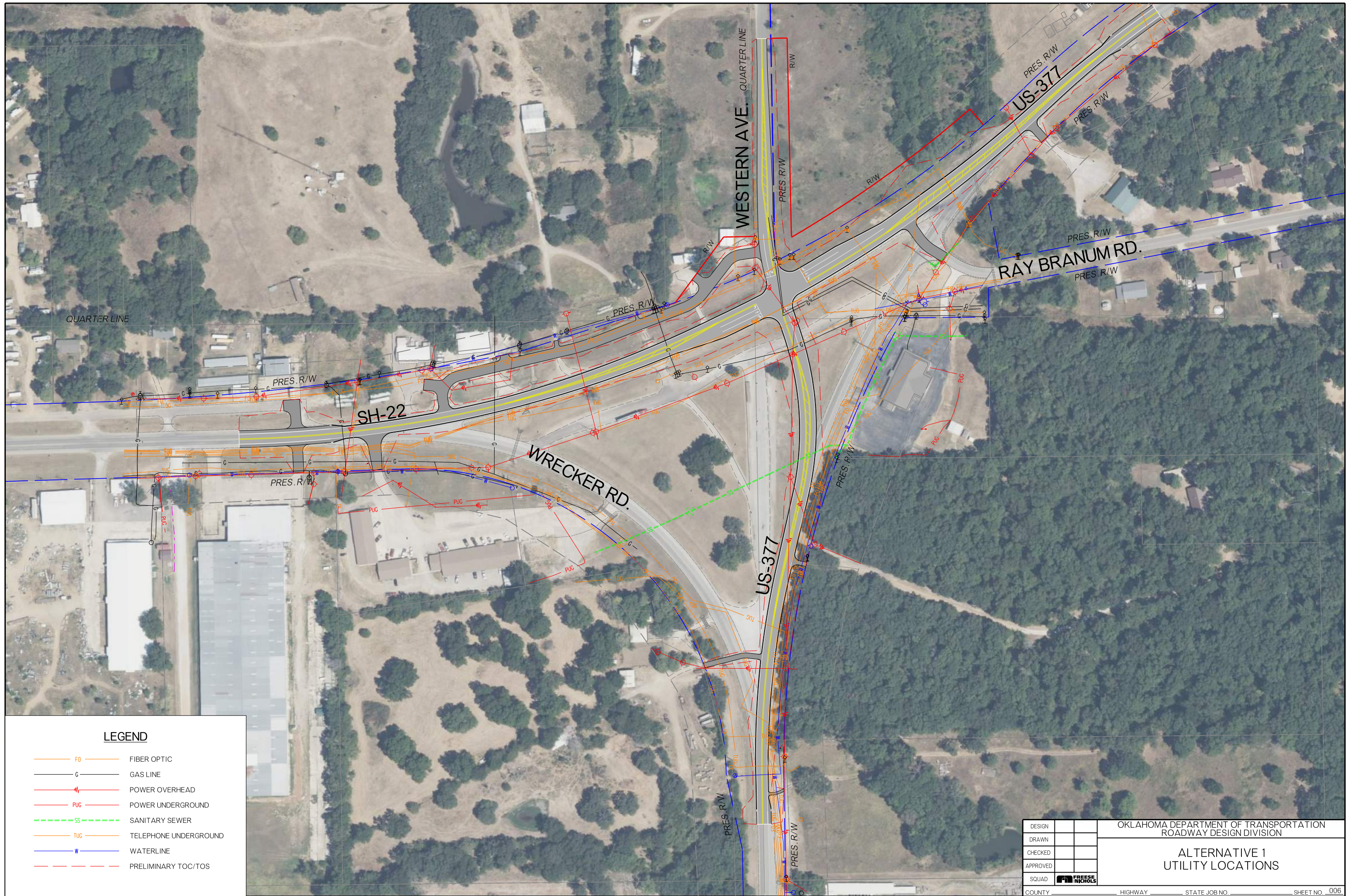
- FO FIBER OPTIC
- G GAS LINE
- PO POWER OVERHEAD
- PUG POWER UNDERGROUND
- - - SS SANITARY SEWER
- TUG TELEPHONE UNDERGROUND
- WATERLINE
- - - PRELIMINARY TOC/TOS

DESIGN	
DRAWN	
CHECKED	
APPROVED	
SQUAD	FREESE NICHOLS
COUNTY	

OKLAHOMA DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION

**NO BUILD - EXISTING WYE
UTILITY LOCATIONS**

COUNTY _____ HIGHWAY _____ STATE JOB NO. _____ SHEET NO. 005



LEGEND

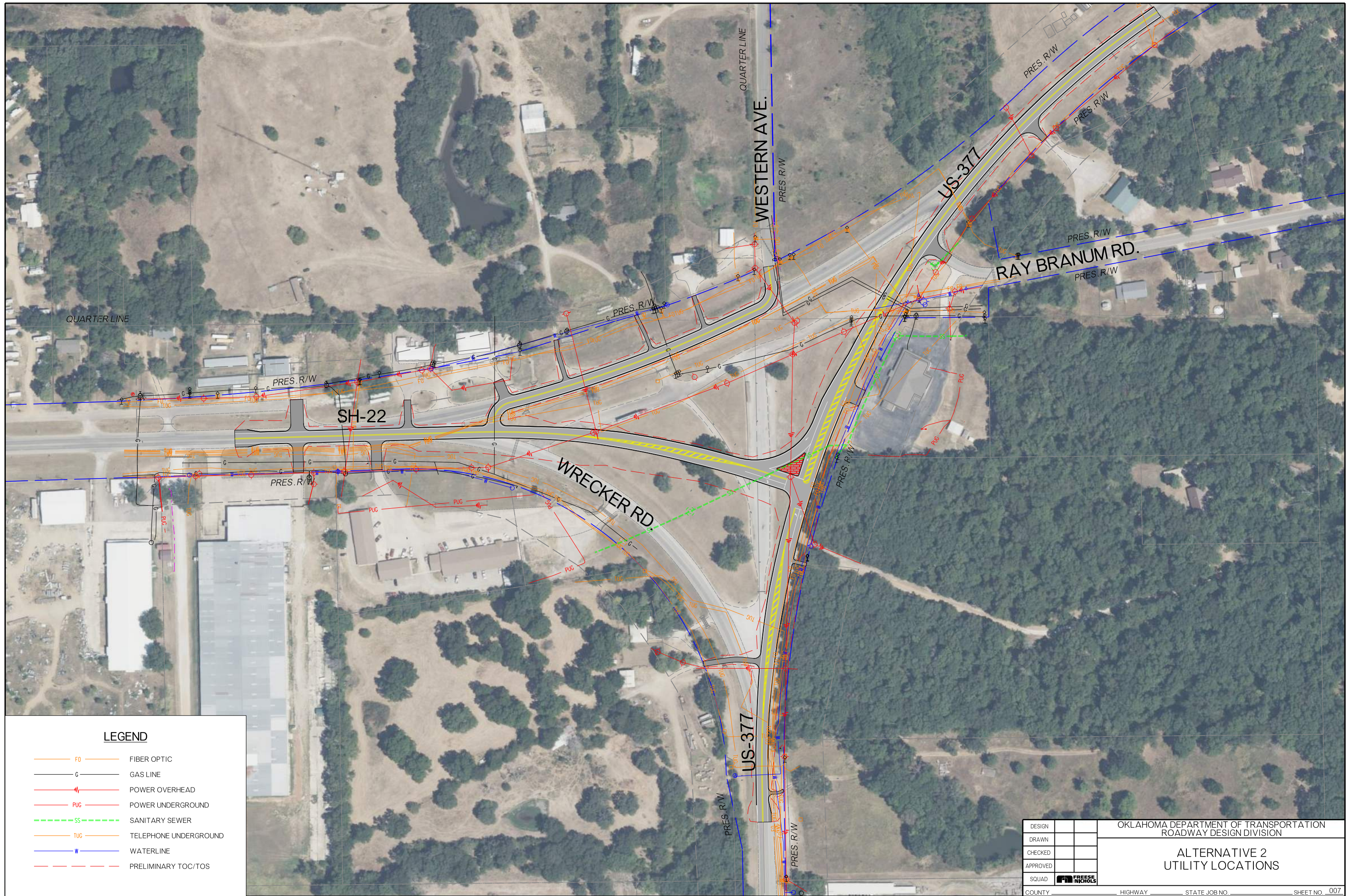
- FO FIBER OPTIC
- G GAS LINE
- P O POWER OVERHEAD
- P U G POWER UNDERGROUND
- - - S S SANITARY SEWER
- T U C TELEPHONE UNDERGROUND
- W WATERLINE
- - - PRELIMINARY TOC/TOS

DESIGN	
DRAWN	
CHECKED	
APPROVED	
SQUAD	FREESE NICHOLS
COUNTY	

OKLAHOMA DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION

**ALTERNATIVE 1
UTILITY LOCATIONS**

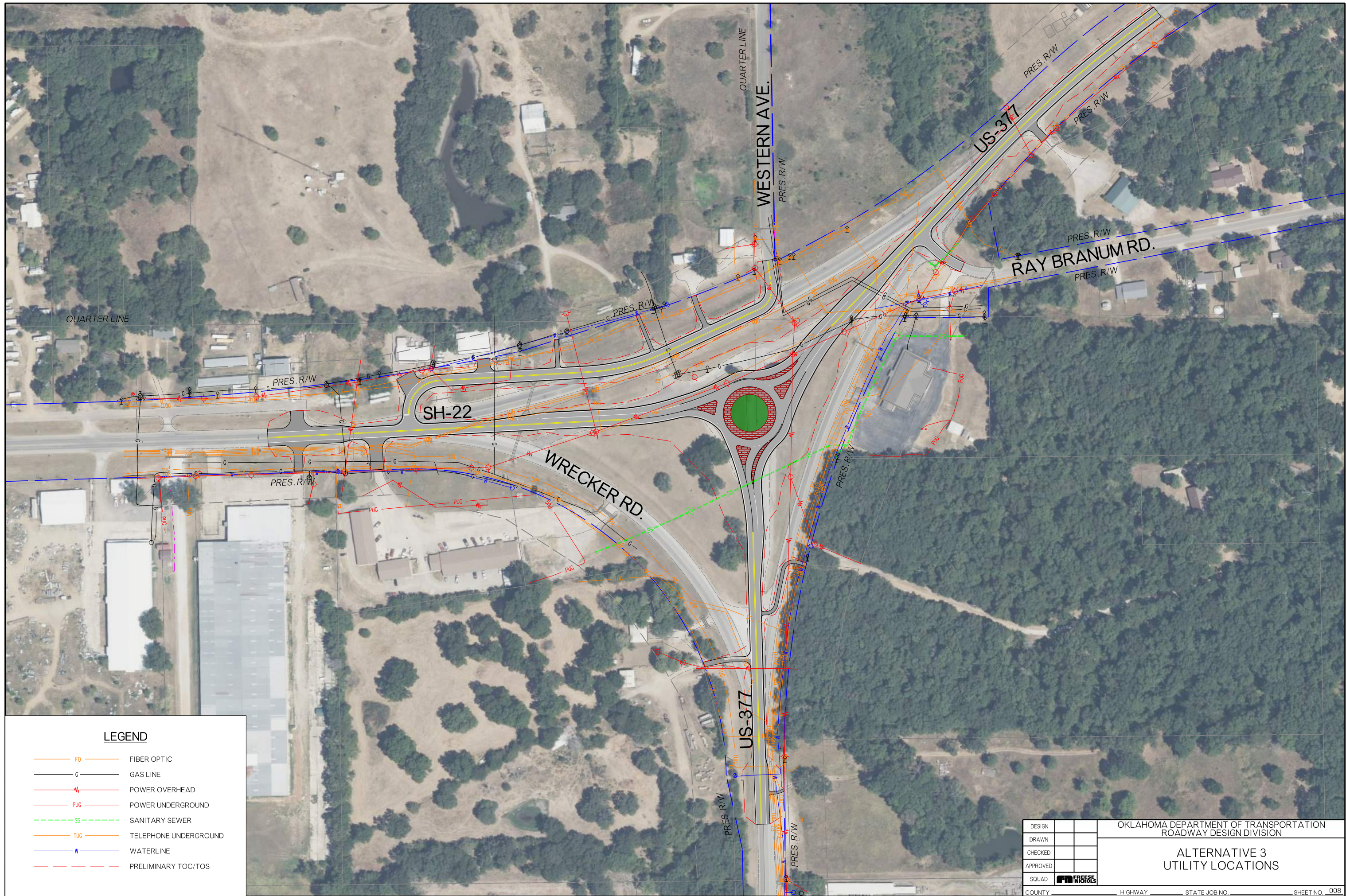
COUNTY _____ HIGHWAY _____ STATE JOB NO. _____ SHEET NO. 006



LEGEND

- FO FIBER OPTIC
- G GAS LINE
- Power Overhead
- PUG POWER UNDERGROUND
- SS SANITARY SEWER
- TUG TELEPHONE UNDERGROUND
- WL WATERLINE
- PRELIMINARY TOC/TOS

DESIGN		OKLAHOMA DEPARTMENT OF TRANSPORTATION ROADWAY DESIGN DIVISION	
DRAWN		ALTERNATIVE 2 UTILITY LOCATIONS	
CHECKED			
APPROVED			
SQUAD	FREESE NICHOLS		
COUNTY	HIGHWAY	STATE JOB NO.	SHEET NO. 007



LEGEND

- FO FIBER OPTIC
- G GAS LINE
- P O POWER OVERHEAD
- PUG POWER UNDERGROUND
- - - SS SANITARY SEWER
- TUG TELEPHONE UNDERGROUND
- W WATERLINE
- - - PRELIMINARY TOC/TOS

DESIGN	
DRAWN	
CHECKED	
APPROVED	
SQUAD	
COUNTY	

OKLAHOMA DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION

**ALTERNATIVE 3
UTILITY LOCATIONS**

_____ HIGHWAY _____ STATE JOB NO. _____ SHEET NO. 008

**APPENDIX C
CONFLICT POINTS**



LEGEND

- CONFLICT POINT - MERGE
- CONFLICT POINT - DIVERGE
- CONFLICT POINT - CROSS

NO BUILD	
TYPE	TOTAL CONFLICTS
MERGE	9
DIVERGE	9
CROSS	9
TOTAL	27

DESIGN	
DRAWN	
CHECKED	
APPROVED	
SQUAD	FREESE NICHOLS

OKLAHOMA DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION

**NO BUILD - EXISTING WYE
CONFLICT POINTS**



LEGEND

- CONFLICT POINT - MERGE
- CONFLICT POINT - DIVERGE
- CONFLICT POINT - CROSS

ALTERNATIVE 1	
TYPE	TOTAL CONFLICTS
MERGE	12
DIVERGE	10
CROSS	16
TOTAL	38

DESIGN	
DRAWN	
CHECKED	
APPROVED	
SQUAD	FREESE NICHOLS

OKLAHOMA DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION

**ALTERNATIVE 1
CONFLICT POINTS**



LEGEND

- CONFLICT POINT - MERGE
- CONFLICT POINT - DIVERGE
- CONFLICT POINT - CROSS

ALTERNATIVE 2	
TYPE	TOTAL CONFLICTS
MERGE	9
DIVERGE	9
CROSS	9
TOTAL	27

DESIGN	
DRAWN	
CHECKED	
APPROVED	
SQUAD	FRESE NICHOLS

OKLAHOMA DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION

**ALTERNATIVE 2
CONFLICT POINTS**

COUNTY _____ HIGHWAY _____ STATE JOB NO. _____ SHEET NO. 011



LEGEND

- CONFLICT POINT - MERGE
- CONFLICT POINT - DIVERGE
- CONFLICT POINT - CROSS

ALTERNATIVE 3	
TYPE	TOTAL CONFLICTS
MERGE	11
DIVERGE	11
CROSS	6
TOTAL	28

DESIGN	
DRAWN	
CHECKED	
APPROVED	
SQUAD	FREESE NICHOLS

OKLAHOMA DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION

**ALTERNATIVE 3
CONFLICT POINTS**

**APPENDIX D
OPINION OF PROBABLE CONSTRUCTION COST**

Project Location:	US-377 and SH-22 (Tishomingo Wye)	 <small>Innovative approaches Practical results Outstanding service</small>
Project JP NO.:	36178(07)	
Intersection Modification:	Alternative 1 - Four-Legged Signalized Intersection	
Project Milestone:	Preliminary Conceptual Cost Estimate	
Date Performed:	12/22/2023	

Project Summary	Realignment of US-377 and Western Ave. to intersect SH-22 at a 10 degree skew. Curb and gutter will be installed leading up to and through the intersection. This estimate includes the installation of traffic signals and dedicated turn bays on each approach.
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	Assumptions	Quantity	Unit
Proposed Pavement Reconstruction	Area	14,918	SY
	Thickness (Base + Surface Course)	11	IN
	Asphalt Weight	112	LB/SY-IN

Item No.	Item Description	Quantity	Unit	Unit Cost	Total Cost
GENERAL ITEMS					
1	CLEARING AND GRUBBING	1	LSUM	\$50,000.00	\$50,000
2	UNCLASSIFIED EXCAVATION	12,432	CY	\$13.00	\$161,610
3	UNCLASSIFIED BORROW	6,216	CY	\$15.00	\$93,237
4	SWPPP DOCUMENTATION AND MANAGEMENT	1	LSUM	\$25,000.00	\$25,000
5	REMOVAL OF PAVEMENT	30,355	SY	\$10.00	\$303,551
6	MOBILIZATION (PER ODOT 641)	1	LSUM	\$215,820.00	\$215,820
7	CONSTRUCTION STAKING LEVEL II	1	LSUM	\$8,100.00	\$8,100
8	LIGHTING	1	LSUM	\$200,000.00	\$200,000
9	TRAFFIC CONTROL	1	LSUM	\$200,000.00	\$200,000
10	DRAINAGE	1	LSUM	\$400,000.00	\$400,000
General Items Subtotal:					\$1,657,318

PAVING ITEMS					
11	SOLID SLAB SODDING	80,192	SY	\$6.00	\$481,150
12	STABILIZED SUBGRADE (OR AGG BASE)	15,896	SY	\$30.00	\$476,870
13	SUPERPAVE, TYPE S3(PG 64-22 OK)	6,683	TON	\$120.00	\$801,986
14	SUPERPAVE, TYPE S4(PG 64-22 OK)	2,506	TON	\$130.00	\$325,807
15	2'-8" COMB.CRB.& GUT.(6" BARRIER)	6,610	LF	\$30.00	\$198,300
16	DRIVEWAY	4,766	SY	\$90.00	\$428,983
Paving Items Subtotal:					\$2,713,095

SIGNAL ITEMS					
17	TRAFFIC SIGNAL	1	LSUM	\$270,000.00	\$270,000
Signal Items Subtotal:					\$270,000

	Subtotal Construction Cost Estimate		\$4,640,500
	Contingency	30%	\$1,392,200
	Total Construction Cost Estimate		\$6,032,700

**This estimate does not include Legal, Administration, Financial, R/W or Utility Cost*

Project Location:	US-377 and SH-22 (Tishomingo Wye)	 <small>Innovative approaches Practical results Outstanding service</small>
Project JP NO.:	36178(07)	
Intersection Modification:	Alternative 2 - Signalized Tee Intersection	
Project Milestone:	Preliminary Conceptual Cost Estimate	
Date Performed:	12/22/2023	

Project Summary	Realignment of SH-22 to intereseect with US-377 forming a T-intersection. Curb and gutter would be installed leading up to and throughout the interesection. Proposed traffic signals and turn bays for each approach will be accounted for in this estimate.
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	Assumptions	Quantity	Unit
Proposed Pavement Reconstruction	Area	14,241	SY
	Thickness (Base + Surface Course)	11	IN
	Asphalt Weight	112	LB/SY-IN


Item No.	Item Description	Quantity	Unit	Unit Cost	Total Cost
GENERAL ITEMS					
1	CLEARING AND GRUBBING	1	LSUM	\$50,000.00	\$50,000
2	UNCLASSIFIED EXCAVATION	11,867	CY	\$13.00	\$154,275
3	UNCLASSIFIED BORROW	5,934	CY	\$15.00	\$89,005
4	SWPPP DOCUMENTATION AND MANAGEMENT	1	LSUM	\$25,000.00	\$25,000
5	REMOVAL OF PAVEMENT	28,931	SY	\$10.00	\$289,312
6	MOBILIZATION (PER ODOT 641)	1	LSUM	\$201,380.00	\$201,380
7	CONSTRUCTION STAKING LEVEL II	1	LSUM	\$7,900.00	\$7,900
8	LIGHTING	1	LSUM	\$175,000.00	\$175,000
9	TRAFFIC CONTROL	1	LSUM	\$200,000.00	\$200,000
10	DRAINAGE	1	LSUM	\$400,000.00	\$400,000
General Items Subtotal:					\$1,591,872

PAVING ITEMS					
11	SOLID SLAB SODDING	74,476	SY	\$6.00	\$446,854
12	STABILIZED SUBGRADE (OR AGG BASE)	14,996	SY	\$30.00	\$449,890
13	SUPERPAVE, TYPE S3(PG 64-22 OK)	6,380	TON	\$120.00	\$765,584
14	SUPERPAVE, TYPE S4(PG 64-22 OK)	2,392	TON	\$130.00	\$311,019
15	2'-8" COMB.CRB.& GUT.(6" BARRIER)	11,122	LF	\$30.00	\$333,660
16	DRIVEWAY	1,977	SY	\$90.00	\$177,913
Paving Items Subtotal:					\$2,484,919

SIGNAL ITEMS					
17	TRAFFIC SIGNAL	1	LSUM	\$235,000.00	\$235,000
Signal Items Subtotal:					\$235,000

	Subtotal Construction Cost Estimate		\$4,311,800
	Contingency	30%	\$1,293,600
	Total Construction Cost Estimate		\$5,605,400

**This estimate does not include Legal, Administration, Financial, R/W or Utility Cost*

Project Location:	US-377 and SH-22 (Tishomingo Wye)	 <small>Innovative approaches Practical results Outstanding service</small>
Project JP NO.:	36178(07)	
Intersection Modification:	Alternative 3 - Roundabout	
Project Milestone:	Preliminary Conceptual Cost Estimate	
Date Performed:	12/22/2023	

Project Summary	Removal existing pavement and roadway reconstruction with proposed roundabout footprint. Truck apron, splitter islands, curb and gutter and lighting to be included.
------------------------	--

	Assumptions	Quantity	Unit
Proposed Pavement Reconstruction	Area	15,855	SY
	Thickness (Base + Surface Course)	11	IN
	Asphalt Weight	112	LB/SY-IN
Turck Apron	Area	637	SY
	Depth	8	IN
Splitter Island	Area	423	SY
	Depth	8	IN

Item No.	Item Description	Quantity	Unit	Unit Cost	Total Cost
GENERAL ITEMS					
1	CLEARING AND GRUBBING	1	LSUM	\$50,000.00	\$50,000
2	UNCLASSIFIED EXCAVATION	14,097	CY	\$13.00	\$183,257
3	UNCLASSIFIED BORROW	7,048	CY	\$15.00	\$105,725
4	SWPPP DOCUMENTATION AND MANAGEMENT	1	LSUM	\$25,000.00	\$25,000
5	REMOVAL OF PAVEMENT	28,617	SY	\$10.00	\$286,171
6	MOBILIZATION (PER ODOT 641)	1	LSUM	\$217,890.00	\$217,890
7	CONSTRUCTION STAKING LEVEL II	1	LSUM	\$8,300.00	\$8,300
8	LIGHTING	1	LSUM	\$200,000.00	\$200,000
9	TRAFFIC CONTROL	1	LSUM	\$200,000.00	\$200,000
10	DRAINAGE	1	LSUM	\$400,000.00	\$400,000
General Items Subtotal:					\$1,676,343

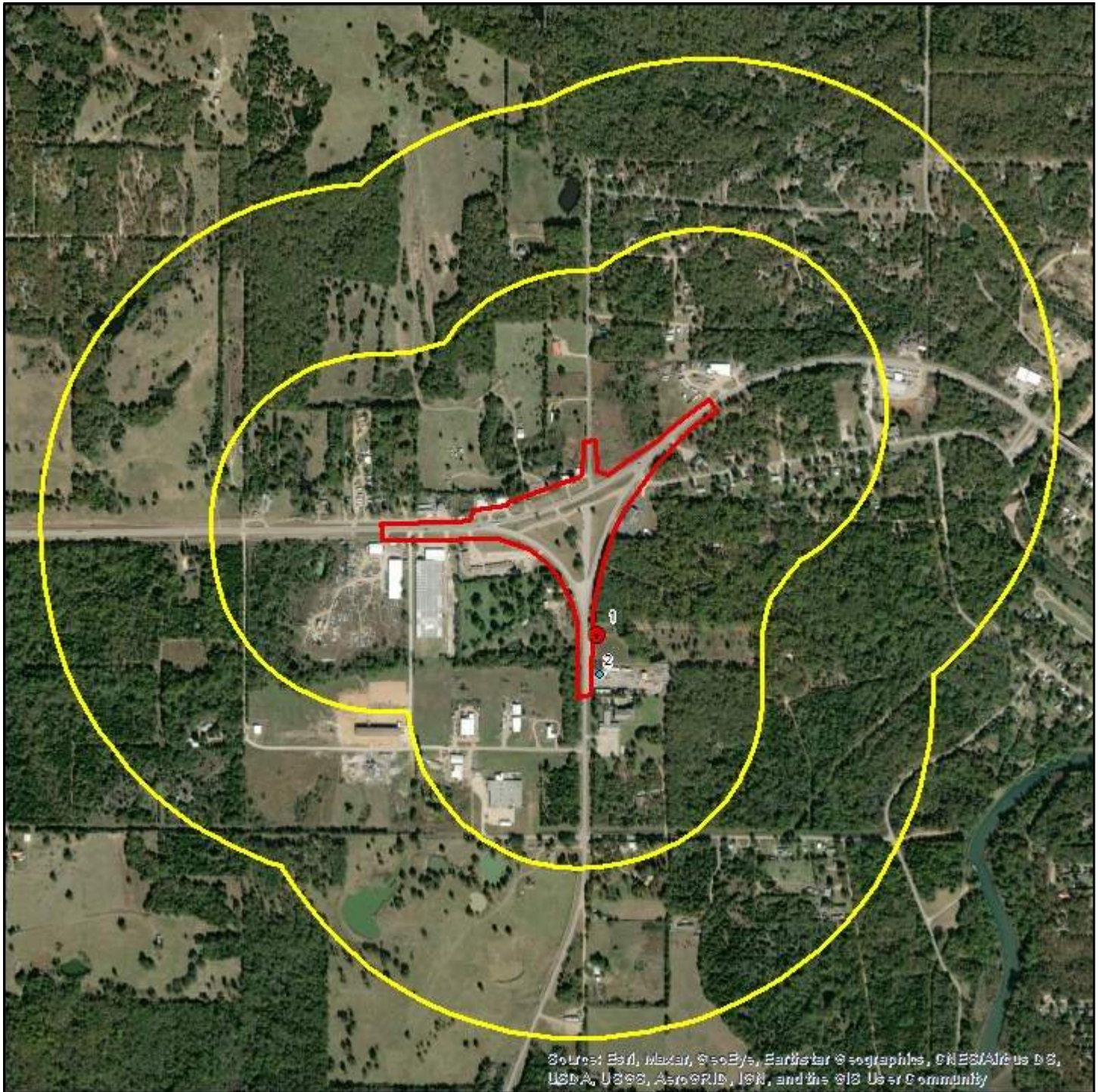
PAVING ITEMS					
11	SOLID SLAB SODDING	71,111	SY	\$6.00	\$426,667
12	STABILIZED SUBGRADE (OR AGG BASE)	17,760	SY	\$30.00	\$532,813
13	CONCRETE PAVEMENT (SPLITTER ISLAND & TRUCK APRON)	1,061	SY	\$20.00	\$21,211
14	P.C. CONCRETE PAVEMENT (8")	236	CY	\$165.00	\$38,887
15	SUPERPAVE, TYPE S3(PG 64-22 OK)	7,103	TON	\$120.00	\$852,389
16	SUPERPAVE, TYPE S4(PG 64-22 OK)	2,664	TON	\$130.00	\$346,283
17	2'-8" COMB.CRB.& GUT.(6" BARRIER)	9,951	LF	\$30.00	\$298,530
18	2'-8" COMB.CRB.& GUT.(4" MOUNTABLE)	2,470	LF	\$50.00	\$123,500
19	DRIVEWAY	1,860	SY	\$90.00	\$167,428
Paving Items Subtotal:					\$2,807,708

Subtotal Construction Cost Estimate				\$4,484,100
Contingency			30%	\$1,345,300
Total Construction Cost Estimate				\$5,829,400

**This estimate does not include Legal, Administration, Financial, R/W or Utility Cost*

**APPENDIX E
ENVIRONMENTAL CONSIDERATIONS**

Current Imagery Overlay Map - 0.5 Mile Buffer



Sources: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

CI-2434: TO1 - TISHOMINGO WYE

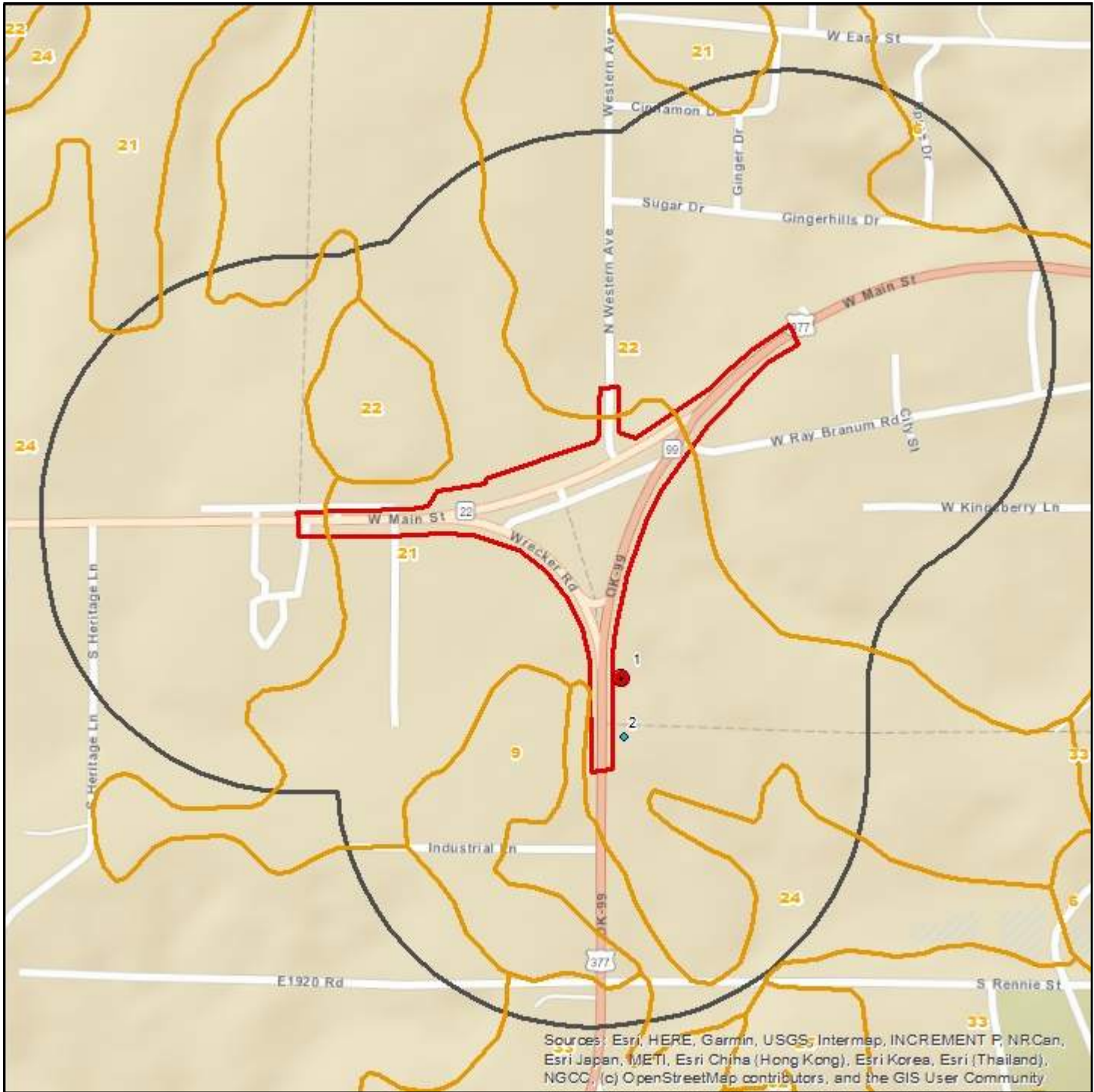
- | | | | | |
|--|---|--|--|---|
| ● Single Site | ● Cluster Site | ■ Large Tract | ■ Cluster Site with Large Tract | Target Property |
| ● Single Site | ● Cluster Site | ■ Large Tract | ■ Cluster Site with Large Tract | Search Buffer |
| ● Single Site | ● Cluster Site | ■ Large Tract | ■ Cluster Site with Large Tract | |
- RCRA COR, RCRA TSD, CER, LPST, NPL, ST NPL, SWLF*
RCRA GEN, ST & FED BWN, ST & FED EC, ST & FED IC, DNPL, CER NFRAP, PST, VCP, ST CER
ERNS, HW, RCRA, DRYC

1 : 13,500
 1 inch = 0.213 miles
 1 inch = 1125 feet
 1 centimeter = 0.135 kilometers
 1 centimeter = 135 meters



Lambert Conformal Conic Projection
 1983 North American Datum
 First Standard Parallel: 33° 0' 00" North
 Second Standard Parallel: 45° 0' 00" North
 Central Meridian: 96° 0' 00" West
 Latitude of Origin: 39° 0' 00" North

Soil Survey Map - 0.25 Mile Buffer



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

CI-2434: TO1 - TISHOMINGO WYE

- | | | | | |
|--|---|--|--|--|
| ● Single Site | ● Cluster Site | ■ Large Tract | ■ Cluster Site with Large Tract | Target Property |
| ● Single Site | ● Cluster Site | ■ Large Tract | ■ Cluster Site with Large Tract | Search Buffer |
| ● Single Site | ● Cluster Site | ■ Large Tract | ■ Cluster Site with Large Tract | Soils Boundary |

1 : 9,000
 1 inch = 0.142 miles
 1 inch = 750 feet
 1 centimeter = 0.090 kilometers
 1 centimeter = 90 meters

Lambert Conformal Conic Projection
 1983 North American Datum
 First Standard Parallel: 33° 00' 00" North
 Second Standard Parallel: 45° 00' 00" North
 Central Meridian: 96° 00' 00" West
 Latitude of Origin: 39° 00' 00" North



**APPENDIX F
SYNCHRO RESULTS**

Intersection

Int Delay, s/veh 0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↑	↔	
Traffic Vol, veh/h	252	17	0	148	6	0
Future Vol, veh/h	252	17	0	148	6	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	47	92	94	50	92
Heavy Vehicles, %	2	6	0	3	1	1
Mvmt Flow	293	36	0	157	12	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	- 468
Stage 1	-	-	- 311
Stage 2	-	-	- 157
Critical Hdwy	-	-	- 6.41
Critical Hdwy Stg 1	-	-	- 5.41
Critical Hdwy Stg 2	-	-	- 5.41
Follow-up Hdwy	-	-	- 3.509
Pot Cap-1 Maneuver	-	0	- 555
Stage 1	-	0	- 745
Stage 2	-	0	- 874
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- 555
Mov Cap-2 Maneuver	-	-	- 555
Stage 1	-	-	- 745
Stage 2	-	-	- 874

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	555	-	-	-
HCM Lane V/C Ratio	0.022	-	-	-
HCM Control Delay (s)	11.6	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	6	246	143	3	3	5
Future Vol, veh/h	6	246	143	3	3	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	82	83	38	38	63
Heavy Vehicles, %	1	2	3	1	1	20
Mvmt Flow	12	300	172	8	8	8

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	180	0	-	0	500 176
Stage 1	-	-	-	-	176 -
Stage 2	-	-	-	-	324 -
Critical Hdwy	4.11	-	-	-	6.41 6.4
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.48
Pot Cap-1 Maneuver	1402	-	-	-	532 823
Stage 1	-	-	-	-	857 -
Stage 2	-	-	-	-	735 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1402	-	-	-	527 823
Mov Cap-2 Maneuver	-	-	-	-	527 -
Stage 1	-	-	-	-	848 -
Stage 2	-	-	-	-	735 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1402	-	-	-	643
HCM Lane V/C Ratio	0.009	-	-	-	0.025
HCM Control Delay (s)	7.6	0	-	-	10.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection												
Int Delay, s/veh	6.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	249	0	0	3	0	0	0	153	7	0	86	146
Future Vol, veh/h	249	0	0	3	0	0	0	153	7	0	86	146
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	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	50	50	75	92	92	92	89	58	50	86	81
Heavy Vehicles, %	2	1	1	1	0	0	1	4	14	0	23	2
Mvmt Flow	296	0	0	4	0	0	0	172	12	0	100	180

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	368	-	-	368	458	178	-	0	0	184	0	0
Stage 1	190	-	-	178	178	-	-	-	-	-	-	-
Stage 2	178	-	-	190	280	-	-	-	-	-	-	-
Critical Hdwy	7.12	-	-	7.11	6.5	6.2	-	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	-	-	6.11	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	6.11	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	-	-	3.509	4	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	588	0	0	590	502	870	0	-	-	1403	-	-
Stage 1	812	0	0	826	756	-	0	-	-	-	-	-
Stage 2	824	0	0	814	683	-	0	-	-	-	-	-
Platoon blocked, %	-											
Mov Cap-1 Maneuver	588	-	-	590	502	870	-	-	-	1403	-	-
Mov Cap-2 Maneuver	588	-	-	590	502	-	-	-	-	-	-	-
Stage 1	812	-	-	826	756	-	-	-	-	-	-	-
Stage 2	824	-	-	814	683	-	-	-	-	-	-	-

Approach	EB		WB		NB			SB		
HCM Control Delay, s	17.2		11.1		0			0		
HCM LOS	C		B							

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	588	590	1403	-	-
HCM Lane V/C Ratio	-	-	0.504	0.007	-	-	-
HCM Control Delay (s)	-	-	17.2	11.1	0	-	-
HCM Lane LOS	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	-	-	2.8	0	0	-	-

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↖	↑	
Traffic Vol, veh/h	0	17	6	160	89	0
Future Vol, veh/h	0	17	6	160	89	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	55	50	86	85	92
Heavy Vehicles, %	0	1	1	4	22	0
Mvmt Flow	0	31	12	186	105	0

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	105	105	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.21	4.11	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.309	2.209	-	-
Pot Cap-1 Maneuver	0	952	1493	-	-
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	952	1493	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT
Capacity (veh/h)	1493	-	952	-
HCM Lane V/C Ratio	0.008	-	0.032	-
HCM Control Delay (s)	7.4	0	8.9	-
HCM Lane LOS	A	A	A	-
HCM 95th %tile Q(veh)	0	-	0.1	-

Intersection

Int Delay, s/veh 0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↑	↔	
Traffic Vol, veh/h	193	20	0	252	12	0
Future Vol, veh/h	193	20	0	252	12	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	71	92	67	75	92
Heavy Vehicles, %	2	0	0	3	8	0
Mvmt Flow	235	28	0	376	16	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	- - 625 -
Stage 1	-	-	- - 249 -
Stage 2	-	-	- - 376 -
Critical Hdwy	-	-	- - 6.48 -
Critical Hdwy Stg 1	-	-	- - 5.48 -
Critical Hdwy Stg 2	-	-	- - 5.48 -
Follow-up Hdwy	-	-	- - 3.572 -
Pot Cap-1 Maneuver	-	- 0	- 439 0
Stage 1	-	- 0	- 779 0
Stage 2	-	- 0	- 681 0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- 439 -
Mov Cap-2 Maneuver	-	-	- 439 -
Stage 1	-	-	- 779 -
Stage 2	-	-	- 681 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	439	-	-	-
HCM Lane V/C Ratio	0.036	-	-	-
HCM Control Delay (s)	13.5	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	6	187	247	5	5	5
Future Vol, veh/h	6	187	247	5	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	86	64	63	42	42
Heavy Vehicles, %	1	1	4	1	1	1
Mvmt Flow	12	217	386	8	12	12

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	394	0	-	0	631 390
Stage 1	-	-	-	-	390 -
Stage 2	-	-	-	-	241 -
Critical Hdwy	4.11	-	-	-	6.41 6.21
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.309
Pot Cap-1 Maneuver	1170	-	-	-	447 661
Stage 1	-	-	-	-	686 -
Stage 2	-	-	-	-	801 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1170	-	-	-	442 661
Mov Cap-2 Maneuver	-	-	-	-	442 -
Stage 1	-	-	-	-	678 -
Stage 2	-	-	-	-	801 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1170	-	-	-	530
HCM Lane V/C Ratio	0.01	-	-	-	0.045
HCM Control Delay (s)	8.1	0	-	-	12.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection												
Int Delay, s/veh	5.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	192	0	0	12	0	2	0	154	7	2	173	252
Future Vol, veh/h	192	0	0	12	0	2	0	154	7	2	173	252
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	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	92	92	43	92	50	92	92	35	50	80	64
Heavy Vehicles, %	2	0	0	8	0	1	2	1	1	1	1	3
Mvmt Flow	231	0	0	28	0	4	0	167	20	4	216	394

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	600	-	-	598	795	177	-	0	0	187	0	0
Stage 1	421	-	-	177	177	-	-	-	-	-	-	-
Stage 2	179	-	-	421	618	-	-	-	-	-	-	-
Critical Hdwy	7.12	-	-	7.18	6.5	6.21	-	-	-	4.11	-	-
Critical Hdwy Stg 1	6.12	-	-	6.18	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	6.18	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	-	-	3.572	4	3.309	-	-	-	2.209	-	-
Pot Cap-1 Maneuver	413	0	0	405	323	869	0	-	-	1393	-	-
Stage 1	610	0	0	811	756	-	0	-	-	-	-	-
Stage 2	823	0	0	599	484	-	0	-	-	-	-	-
Platoon blocked, %	-											
Mov Cap-1 Maneuver	410	-	-	403	321	869	-	-	-	1393	-	-
Mov Cap-2 Maneuver	410	-	-	403	321	-	-	-	-	-	-	-
Stage 1	610	-	-	811	756	-	-	-	-	-	-	-
Stage 2	819	-	-	596	482	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	24.6		14		0		0	
HCM LOS	C		B					

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	410	432	1393	-	-
HCM Lane V/C Ratio	-	-	0.564	0.074	0.003	-	-
HCM Control Delay (s)	-	-	24.6	14	7.6	0	-
HCM Lane LOS	-	-	C	B	A	A	-
HCM 95th %tile Q(veh)	-	-	3.4	0.2	0	-	-

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↖	↗	
Traffic Vol, veh/h	0	20	12	161	185	0
Future Vol, veh/h	0	20	12	161	185	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	64	50	86	81	92
Heavy Vehicles, %	0	1	8	2	1	0
Mvmt Flow	0	31	24	187	228	0

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	228	228	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.21	4.18	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.309	2.272	-	-
Pot Cap-1 Maneuver	0	814	1306	-	-
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	814	1306	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT
Capacity (veh/h)	1306	-	814	-
HCM Lane V/C Ratio	0.018	-	0.038	-
HCM Control Delay (s)	7.8	0	9.6	-
HCM Lane LOS	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-

Intersection

Int Delay, s/veh 0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↑	↔	
Traffic Vol, veh/h	360	30	0	210	10	0
Future Vol, veh/h	360	30	0	210	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	47	92	94	50	92
Heavy Vehicles, %	2	6	0	3	1	0
Mvmt Flow	419	64	0	223	20	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	- - 674 -
Stage 1	-	-	- - 451 -
Stage 2	-	-	- - 223 -
Critical Hdwy	-	-	- - 6.41 -
Critical Hdwy Stg 1	-	-	- - 5.41 -
Critical Hdwy Stg 2	-	-	- - 5.41 -
Follow-up Hdwy	-	-	- - 3.509 -
Pot Cap-1 Maneuver	-	-	0 - 422 0
Stage 1	-	-	0 - 644 0
Stage 2	-	-	0 - 816 0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- - 422 -
Mov Cap-2 Maneuver	-	-	- - 422 -
Stage 1	-	-	- - 644 -
Stage 2	-	-	- - 816 -

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	422	-	-	-
HCM Lane V/C Ratio	0.047	-	-	-
HCM Control Delay (s)	14	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	10	350	200	10	10	10
Future Vol, veh/h	10	350	200	10	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	82	83	38	38	63
Heavy Vehicles, %	1	2	3	1	1	20
Mvmt Flow	20	427	241	26	26	16

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	267	0	-	0	721
Stage 1	-	-	-	-	254
Stage 2	-	-	-	-	467
Critical Hdwy	4.11	-	-	-	6.41
Critical Hdwy Stg 1	-	-	-	-	5.41
Critical Hdwy Stg 2	-	-	-	-	5.41
Follow-up Hdwy	2.209	-	-	-	3.509
Pot Cap-1 Maneuver	1303	-	-	-	396
Stage 1	-	-	-	-	791
Stage 2	-	-	-	-	633
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1303	-	-	-	388
Mov Cap-2 Maneuver	-	-	-	-	388
Stage 1	-	-	-	-	775
Stage 2	-	-	-	-	633

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	13.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1303	-	-	-	473
HCM Lane V/C Ratio	0.015	-	-	-	0.089
HCM Control Delay (s)	7.8	0	-	-	13.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection												
Int Delay, s/veh	21.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	360	0	0	10	0	0	0	220	10	0	120	210
Future Vol, veh/h	360	0	0	10	0	0	0	220	10	0	120	210
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	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	92	92	75	92	92	92	89	58	92	86	81
Heavy Vehicles, %	2	0	0	0	0	0	0	4	14	0	23	2
Mvmt Flow	429	0	0	13	0	0	0	247	17	0	140	259

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	526	-	-	526	655	256	-	0	0	264	0	0
Stage 1	270	-	-	256	256	-	-	-	-	-	-	-
Stage 2	256	-	-	270	399	-	-	-	-	-	-	-
Critical Hdwy	7.12	-	-	7.1	6.5	6.2	-	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	-	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	-	-	3.5	4	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver	462	0	0	466	388	788	0	-	-	1312	-	-
Stage 1	736	0	0	753	699	-	0	-	-	-	-	-
Stage 2	749	0	0	740	606	-	0	-	-	-	-	-
Platoon blocked, %	-											
Mov Cap-1 Maneuver	462	-	-	466	388	788	-	-	-	1312	-	-
Mov Cap-2 Maneuver	462	-	-	466	388	-	-	-	-	-	-	-
Stage 1	736	-	-	753	699	-	-	-	-	-	-	-
Stage 2	749	-	-	740	606	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	55.8		13		0		0	
HCM LOS	F		B					

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	462	466	1312	-	-
HCM Lane V/C Ratio	-	-	0.928	0.029	-	-	-
HCM Control Delay (s)	-	-	55.8	13	0	-	-
HCM Lane LOS	-	-	F	B	A	-	-
HCM 95th %tile Q(veh)	-	-	10.8	0.1	0	-	-

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↖	↗	
Traffic Vol, veh/h	0	30	10	230	130	0
Future Vol, veh/h	0	30	10	230	130	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	55	50	86	85	92
Heavy Vehicles, %	0	1	1	4	22	0
Mvmt Flow	0	55	20	267	153	0

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	-	153	153	0	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	6.21	4.11	-	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	3.309	2.209	-	-
Pot Cap-1 Maneuver	0	896	1434	-	-
Stage 1	0	-	-	-	-
Stage 2	0	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	-	896	1434	-	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT
Capacity (veh/h)	1434	-	896	-
HCM Lane V/C Ratio	0.014	-	0.061	-
HCM Control Delay (s)	7.5	0	9.3	-
HCM Lane LOS	A	A	A	-
HCM 95th %tile Q(veh)	0	-	0.2	-

Intersection

Int Delay, s/veh	0.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↑	↔	
Traffic Vol, veh/h	280	30	0	360	20	0
Future Vol, veh/h	280	30	0	360	20	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	71	92	67	75	92
Heavy Vehicles, %	2	1	0	3	8	0
Mvmt Flow	341	42	0	537	27	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	-	-	899
Stage 1	-	-	-	-	362
Stage 2	-	-	-	-	537
Critical Hdwy	-	-	-	-	6.48
Critical Hdwy Stg 1	-	-	-	-	5.48
Critical Hdwy Stg 2	-	-	-	-	5.48
Follow-up Hdwy	-	-	-	-	3.572
Pot Cap-1 Maneuver	-	-	0	-	302
Stage 1	-	-	0	-	691
Stage 2	-	-	0	-	574
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	302
Mov Cap-2 Maneuver	-	-	-	-	302
Stage 1	-	-	-	-	691
Stage 2	-	-	-	-	574

Approach	EB	WB	NB
HCM Control Delay, s	0	0	18.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	302	-	-	-
HCM Lane V/C Ratio	0.088	-	-	-
HCM Control Delay (s)	18.1	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.3	-	-	-

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	10	270	350	10	10	10
Future Vol, veh/h	10	270	350	10	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	86	64	63	42	42
Heavy Vehicles, %	1	1	4	1	1	1
Mvmt Flow	20	314	547	16	24	24

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	563	0	-	0	909 555
Stage 1	-	-	-	-	555 -
Stage 2	-	-	-	-	354 -
Critical Hdwy	4.11	-	-	-	6.41 6.21
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.309
Pot Cap-1 Maneuver	1013	-	-	-	307 533
Stage 1	-	-	-	-	577 -
Stage 2	-	-	-	-	713 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1013	-	-	-	300 533
Mov Cap-2 Maneuver	-	-	-	-	300 -
Stage 1	-	-	-	-	563 -
Stage 2	-	-	-	-	713 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1013	-	-	-	384
HCM Lane V/C Ratio	0.02	-	-	-	0.124
HCM Control Delay (s)	8.6	0	-	-	15.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection												
Int Delay, s/veh	49.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	280	0	0	20	0	10	0	220	10	10	250	360
Future Vol, veh/h	280	0	0	20	0	10	0	220	10	10	250	360
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	0	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	92	92	43	92	50	92	92	35	50	80	64
Heavy Vehicles, %	2	0	0	8	0	1	0	2	1	1	1	3
Mvmt Flow	337	0	0	47	0	20	0	239	29	20	313	563

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	899	-	-	889	1170	254	-	0	0	268	0	0
Stage 1	635	-	-	254	254	-	-	-	-	-	-	-
Stage 2	264	-	-	635	916	-	-	-	-	-	-	-
Critical Hdwy	7.12	-	-	7.18	6.5	6.21	-	-	-	4.11	-	-
Critical Hdwy Stg 1	6.12	-	-	6.18	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	-	-	6.18	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	-	-	3.572	4	3.309	-	-	-	2.209	-	-
Pot Cap-1 Maneuver	~ 260	0	0	258	195	787	0	-	-	1302	-	-
Stage 1	467	0	0	737	701	-	0	-	-	-	-	-
Stage 2	741	0	0	457	354	-	0	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	~ 247	-	-	251	188	787	-	-	-	1302	-	-
Mov Cap-2 Maneuver	~ 247	-	-	251	188	-	-	-	-	-	-	-
Stage 1	467	-	-	737	701	-	-	-	-	-	-	-
Stage 2	722	-	-	441	342	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	227.3		19.4		0		0.2	
HCM LOS	F		C					

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	-	-	247	316	1302	-	-
HCM Lane V/C Ratio	-	-	1.366	0.21	0.015	-	-
HCM Control Delay (s)	-	-	227.3	19.4	7.8	0	-
HCM Lane LOS	-	-	F	C	A	A	-
HCM 95th %tile Q(veh)	-	-	18.2	0.8	0	-	-

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

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↖	↗	
Traffic Vol, veh/h	0	30	20	230	270	0
Future Vol, veh/h	0	30	20	230	270	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	64	69	84	81	92
Heavy Vehicles, %	0	0	8	2	1	0
Mvmt Flow	0	47	29	274	333	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	333	333	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	4.18	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.272	-	-	-
Pot Cap-1 Maneuver	0	713	1193	-	-	0
Stage 1	0	-	-	-	-	0
Stage 2	0	-	-	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	713	1193	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	0.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT
Capacity (veh/h)	1193	-	713	-
HCM Lane V/C Ratio	0.024	-	0.066	-
HCM Control Delay (s)	8.1	0	10.4	-
HCM Lane LOS	A	A	B	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-

HCM 6th Signalized Intersection Summary
 SH-22, US-377 and Western Ave

12/21/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗		↖	↗	
Traffic Volume (veh/h)	6	246	17	89	143	3	6	1	160	3	1	5
Future Volume (veh/h)	6	246	17	89	143	3	6	1	160	3	1	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1870	1811	1574	1856	1885	1885	1885	1841	1885	1885	1530
Adj Flow Rate, veh/h	12	300	36	103	172	8	10	2	186	8	2	8
Peak Hour Factor	0.50	0.82	0.47	0.86	0.83	0.38	0.60	0.50	0.86	0.38	0.50	0.63
Percent Heavy Veh, %	1	2	6	22	3	1	1	1	4	1	1	25
Cap, veh/h	738	715	587	583	709	611	597	3	283	435	59	236
Arrive On Green	0.38	0.38	0.38	0.38	0.38	0.38	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1214	1870	1535	879	1856	1598	1416	17	1583	1205	330	1318
Grp Volume(v), veh/h	12	300	36	103	172	8	10	0	188	8	0	10
Grp Sat Flow(s),veh/h/ln	1214	1870	1535	879	1856	1598	1416	0	1600	1205	0	1648
Q Serve(g_s), s	0.1	2.4	0.3	2.0	1.3	0.1	0.1	0.0	2.2	0.1	0.0	0.1
Cycle Q Clear(g_c), s	1.4	2.4	0.3	4.4	1.3	0.1	0.2	0.0	2.2	2.4	0.0	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.80
Lane Grp Cap(c), veh/h	738	715	587	583	709	611	597	0	286	435	0	295
V/C Ratio(X)	0.02	0.42	0.06	0.18	0.24	0.01	0.02	0.00	0.66	0.02	0.00	0.03
Avail Cap(c_a), veh/h	1962	2600	2134	1469	2580	2221	1898	0	1756	1542	0	1809
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	4.8	4.7	4.0	6.3	4.3	3.9	7.0	0.0	7.8	8.9	0.0	7.0
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.1	0.2	0.0	0.0	0.0	2.6	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.8	5.1	4.0	6.4	4.5	3.9	7.1	0.0	10.4	9.0	0.0	7.0
LnGrp LOS	A	A	A	A	A	A	A	A	B	A	A	A
Approach Vol, veh/h		348			283			198				18
Approach Delay, s/veh		4.9			5.2			10.2				7.9
Approach LOS		A			A			B				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		12.3		8.2		12.3		8.2				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		28.5		22.5		28.5		22.5				
Max Q Clear Time (g_c+I1), s		4.4		4.2		6.4		4.4				
Green Ext Time (p_c), s		1.7		0.9		1.4		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				6.3								
HCM 6th LOS				A								

Intersection						
Int Delay, s/veh	0.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	402	7	0	232	3	0
Future Vol, veh/h	402	7	0	232	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	58	50	83	75	50
Heavy Vehicles, %	3	14	1	10	1	1
Mvmt Flow	467	12	0	280	4	0























Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	479	0	753
Stage 1	-	-	-	-	473
Stage 2	-	-	-	-	280
Critical Hdwy	-	-	4.11	-	6.41
Critical Hdwy Stg 1	-	-	-	-	5.41
Critical Hdwy Stg 2	-	-	-	-	5.41
Follow-up Hdwy	-	-	2.209	-	3.509
Pot Cap-1 Maneuver	-	-	1089	-	379
Stage 1	-	-	-	-	629
Stage 2	-	-	-	-	770
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1089	-	379
Mov Cap-2 Maneuver	-	-	-	-	379
Stage 1	-	-	-	-	629
Stage 2	-	-	-	-	770

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	379	-	-	1089	-
HCM Lane V/C Ratio	0.011	-	-	-	-
HCM Control Delay (s)	14.6	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

HCM 6th Signalized Intersection Summary
 SH-22, US-377 and Western Ave

12/21/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	187	20	185	247	5	12	1	161	5	1	5
Future Volume (veh/h)	6	187	20	185	247	5	12	1	161	5	1	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1841	1885	1752	1885	1856	1885	1885	1885
Adj Flow Rate, veh/h	12	217	28	243	386	8	24	2	187	12	2	12
Peak Hour Factor	0.50	0.86	0.71	0.76	0.64	0.63	0.50	0.50	0.86	0.42	0.50	0.42
Percent Heavy Veh, %	1	1	1	2	4	1	10	1	3	1	1	1
Cap, veh/h	595	846	717	721	826	717	526	3	292	384	43	259
Arrive On Green	0.45	0.45	0.45	0.45	0.45	0.45	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	998	1885	1598	1135	1841	1598	1311	17	1583	1204	233	1400
Grp Volume(v), veh/h	12	217	28	243	386	8	24	0	189	12	0	14
Grp Sat Flow(s),veh/h/ln	998	1885	1598	1135	1841	1598	1311	0	1600	1204	0	1633
Q Serve(g_s), s	0.2	1.8	0.2	4.2	3.6	0.1	0.4	0.0	2.7	0.2	0.0	0.2
Cycle Q Clear(g_c), s	3.8	1.8	0.2	5.9	3.6	0.1	0.5	0.0	2.7	2.9	0.0	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.86
Lane Grp Cap(c), veh/h	595	846	717	721	826	717	526	0	296	384	0	302
V/C Ratio(X)	0.02	0.26	0.04	0.34	0.47	0.01	0.05	0.00	0.64	0.03	0.00	0.05
Avail Cap(c_a), veh/h	1346	2265	1920	1576	2212	1920	1432	0	1401	1216	0	1430
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	6.0	4.2	3.8	6.1	4.7	3.7	8.5	0.0	9.3	10.6	0.0	8.2
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.3	0.4	0.0	0.0	0.0	2.3	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.3	0.2	0.0	0.1	0.0	0.6	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.1	4.4	3.8	6.3	5.1	3.8	8.5	0.0	11.6	10.6	0.0	8.3
LnGrp LOS	A	A	A	A	A	A	A	A	B	B	A	A
Approach Vol, veh/h		257			637			213				26
Approach Delay, s/veh		4.4			5.6			11.2				9.4
Approach LOS		A			A			B				A
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		15.5		9.0		15.5		9.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+I1), s		5.8		4.7		7.9		4.9				
Green Ext Time (p_c), s		1.2		1.0		3.1		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				6.5								
HCM 6th LOS				A								

Intersection						
Int Delay, s/veh	0.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	346	7	2	425	12	2
Future Vol, veh/h	346	7	2	425	12	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	35	50	70	43	50
Heavy Vehicles, %	2	1	1	2	8	1
Mvmt Flow	398	20	4	607	28	4

























Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	418	0	1023
Stage 1	-	-	-	-	408
Stage 2	-	-	-	-	615
Critical Hdwy	-	-	4.11	-	6.48
Critical Hdwy Stg 1	-	-	-	-	5.48
Critical Hdwy Stg 2	-	-	-	-	5.48
Follow-up Hdwy	-	-	2.209	-	3.572
Pot Cap-1 Maneuver	-	-	1146	-	254
Stage 1	-	-	-	-	659
Stage 2	-	-	-	-	528
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1146	-	253
Mov Cap-2 Maneuver	-	-	-	-	253
Stage 1	-	-	-	-	659
Stage 2	-	-	-	-	525

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	19.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	274	-	-	1146	-
HCM Lane V/C Ratio	0.116	-	-	0.003	-
HCM Control Delay (s)	19.9	-	-	8.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

HCM 6th Signalized Intersection Summary
 SH-22, US-377 and Western Ave

12/21/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	350	30	130	200	10	10	2	230	10	2	10
Future Volume (veh/h)	10	350	30	130	200	10	10	2	230	10	2	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1870	1811	1574	1856	1885	1885	1885	1841	1885	1885	1530
Adj Flow Rate, veh/h	20	427	64	151	241	26	20	4	267	26	4	16
Peak Hour Factor	0.50	0.82	0.47	0.86	0.83	0.38	0.50	0.50	0.86	0.38	0.50	0.63
Percent Heavy Veh, %	1	2	6	22	3	1	1	1	4	1	1	25
Cap, veh/h	665	872	716	466	865	745	561	6	386	333	81	322
Arrive On Green	0.47	0.47	0.47	0.47	0.47	0.47	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1121	1870	1535	762	1856	1598	1403	24	1578	1117	330	1318
Grp Volume(v), veh/h	20	427	64	151	241	26	20	0	271	26	0	20
Grp Sat Flow(s),veh/h/ln	1121	1870	1535	762	1856	1598	1403	0	1601	1117	0	1648
Q Serve(g_s), s	0.3	4.9	0.7	5.3	2.5	0.3	0.3	0.0	4.8	0.7	0.0	0.3
Cycle Q Clear(g_c), s	2.8	4.9	0.7	10.2	2.5	0.3	0.6	0.0	4.8	5.5	0.0	0.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.80
Lane Grp Cap(c), veh/h	665	872	716	466	865	745	561	0	392	333	0	403
V/C Ratio(X)	0.03	0.49	0.09	0.32	0.28	0.03	0.04	0.00	0.69	0.08	0.00	0.05
Avail Cap(c_a), veh/h	1276	1892	1553	882	1877	1616	1097	0	1003	759	0	1032
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	6.0	5.7	4.6	9.3	5.1	4.5	9.2	0.0	10.7	13.2	0.0	9.0
Incr Delay (d2), s/veh	0.0	0.4	0.1	0.4	0.2	0.0	0.0	0.0	2.2	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.7	0.1	0.5	0.3	0.0	0.1	0.0	1.2	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.0	6.2	4.7	9.7	5.3	4.5	9.3	0.0	12.9	13.3	0.0	9.0
LnGrp LOS	A	A	A	A	A	A	A	A	B	B	A	A
Approach Vol, veh/h		511			418			291				46
Approach Delay, s/veh		6.0			6.8			12.6				11.4
Approach LOS		A			A			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		19.0		12.1		19.0		12.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		19.5		31.5		19.5				
Max Q Clear Time (g_c+I1), s		6.9		6.8		12.2		7.5				
Green Ext Time (p_c), s		2.7		1.3		2.3		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				8.0								
HCM 6th LOS				A								

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	580	10	0	330	10	0
Future Vol, veh/h	580	10	0	330	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	58	50	83	75	50
Heavy Vehicles, %	3	14	1	10	1	1
Mvmt Flow	674	17	0	398	13	0

























Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	691	0	1081
Stage 1	-	-	-	-	683
Stage 2	-	-	-	-	398
Critical Hdwy	-	-	4.11	-	6.41
Critical Hdwy Stg 1	-	-	-	-	5.41
Critical Hdwy Stg 2	-	-	-	-	5.41
Follow-up Hdwy	-	-	2.209	-	3.509
Pot Cap-1 Maneuver	-	-	908	-	242
Stage 1	-	-	-	-	503
Stage 2	-	-	-	-	681
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	908	-	242
Mov Cap-2 Maneuver	-	-	-	-	242
Stage 1	-	-	-	-	503
Stage 2	-	-	-	-	681

Approach	EB	WB	NB
HCM Control Delay, s	0	0	20.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	242	-	-	908	-
HCM Lane V/C Ratio	0.055	-	-	-	-
HCM Control Delay (s)	20.7	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

HCM 6th Signalized Intersection Summary
 SH-22, US-377 and Western Ave

12/21/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	270	30	270	350	10	20	2	230	10	2	10
Future Volume (veh/h)	10	270	30	270	350	10	20	2	230	10	2	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1841	1885	1752	1885	1856	1885	1885	1885
Adj Flow Rate, veh/h	20	314	42	355	547	16	29	4	274	24	4	24
Peak Hour Factor	0.50	0.86	0.71	0.76	0.64	0.63	0.69	0.50	0.84	0.42	0.50	0.42
Percent Heavy Veh, %	1	1	1	2	4	1	10	1	3	1	1	1
Cap, veh/h	476	1023	867	641	999	867	465	5	371	260	55	329
Arrive On Green	0.54	0.54	0.54	0.54	0.54	0.54	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	854	1885	1598	1025	1841	1598	1295	23	1578	1110	233	1400
Grp Volume(v), veh/h	20	314	42	355	547	16	29	0	278	24	0	28
Grp Sat Flow(s),veh/h/ln	854	1885	1598	1025	1841	1598	1295	0	1601	1110	0	1633
Q Serve(g_s), s	0.6	3.7	0.5	11.8	7.8	0.2	0.7	0.0	6.5	0.8	0.0	0.5
Cycle Q Clear(g_c), s	8.4	3.7	0.5	15.4	7.8	0.2	1.3	0.0	6.5	7.3	0.0	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.86
Lane Grp Cap(c), veh/h	476	1023	867	641	999	867	465	0	376	260	0	384
V/C Ratio(X)	0.04	0.31	0.05	0.55	0.55	0.02	0.06	0.00	0.74	0.09	0.00	0.07
Avail Cap(c_a), veh/h	700	1516	1285	909	1480	1285	753	0	733	508	0	748
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.8	5.1	4.3	9.3	6.0	4.3	12.5	0.0	14.3	17.7	0.0	12.0
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.8	0.5	0.0	0.1	0.0	2.9	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.6	0.1	1.5	1.3	0.0	0.2	0.0	2.0	0.2	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.8	5.2	4.4	10.1	6.5	4.3	12.6	0.0	17.2	17.9	0.0	12.1
LnGrp LOS	A	A	A	B	A	A	B	A	B	B	A	B
Approach Vol, veh/h		376			918			307				52
Approach Delay, s/veh		5.3			7.8			16.7				14.8
Approach LOS		A			A			B				B
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		26.4		14.0		26.4		14.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		32.5		18.5		32.5		18.5				
Max Q Clear Time (g_c+I1), s		10.4		8.5		17.4		9.3				
Green Ext Time (p_c), s		1.9		1.2		4.5		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				9.1								
HCM 6th LOS				A								

Intersection						
Int Delay, s/veh	1.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	500	10	10	610	20	10
Future Vol, veh/h	500	10	10	610	20	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	58	50	70	43	50
Heavy Vehicles, %	2	1	1	2	8	1
Mvmt Flow	575	17	20	871	47	20

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	592	0	1495
Stage 1	-	-	-	-	584
Stage 2	-	-	-	-	911
Critical Hdwy	-	-	4.11	-	6.48
Critical Hdwy Stg 1	-	-	-	-	5.48
Critical Hdwy Stg 2	-	-	-	-	5.48
Follow-up Hdwy	-	-	2.209	-	3.572
Pot Cap-1 Maneuver	-	-	989	-	131
Stage 1	-	-	-	-	546
Stage 2	-	-	-	-	383
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	989	-	126
Mov Cap-2 Maneuver	-	-	-	-	126
Stage 1	-	-	-	-	546
Stage 2	-	-	-	-	368

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	41.5
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	163	-	-	989	-
HCM Lane V/C Ratio	0.408	-	-	0.02	-
HCM Control Delay (s)	41.5	-	-	8.7	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	1.8	-	-	0.1	-

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	6	263	149	3	3	5
Future Vol, veh/h	6	263	149	3	3	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	79	81	38	38	63
Heavy Vehicles, %	1	3	3	1	1	20
Mvmt Flow	12	333	184	8	8	8

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	192	0	-	0	545 188
Stage 1	-	-	-	-	188 -
Stage 2	-	-	-	-	357 -
Critical Hdwy	4.11	-	-	-	6.41 6.4
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.48
Pot Cap-1 Maneuver	1388	-	-	-	501 810
Stage 1	-	-	-	-	846 -
Stage 2	-	-	-	-	710 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1388	-	-	-	495 810
Mov Cap-2 Maneuver	-	-	-	-	495 -
Stage 1	-	-	-	-	837 -
Stage 2	-	-	-	-	710 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1388	-	-	-	615
HCM Lane V/C Ratio	0.009	-	-	-	0.026
HCM Control Delay (s)	7.6	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	249	17	6	160	89	146
Future Volume (veh/h)	249	17	6	160	89	146
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1885	1885	1841	1574	1870
Adj Flow Rate, veh/h	296	36	12	186	103	180
Peak Hour Factor	0.84	0.47	0.50	0.86	0.86	0.81
Percent Heavy Veh, %	2	1	1	4	22	2
Cap, veh/h	447	401	667	493	421	822
Arrive On Green	0.25	0.25	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1781	1598	1302	1841	1574	1585
Grp Volume(v), veh/h	296	36	12	186	103	180
Grp Sat Flow(s),veh/h/ln	1781	1598	1302	1841	1574	1585
Q Serve(g_s), s	2.8	0.3	0.1	1.5	1.0	1.2
Cycle Q Clear(g_c), s	2.8	0.3	1.1	1.5	1.0	1.2
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	447	401	667	493	421	822
V/C Ratio(X)	0.66	0.09	0.02	0.38	0.24	0.22
Avail Cap(c_a), veh/h	2526	2266	2025	2414	2064	2476
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.3	5.4	5.8	5.6	5.4	2.4
Incr Delay (d2), s/veh	1.7	0.1	0.0	0.5	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	0.1	0.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.0	5.5	5.8	6.1	5.7	2.6
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	332			198	283	
Approach Delay, s/veh	7.7			6.0	3.7	
Approach LOS	A			A	A	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		9.5		9.2		9.5
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		24.5		26.5		24.5
Max Q Clear Time (g_c+I1), s		3.5		4.8		3.2
Green Ext Time (p_c), s		0.9		0.9		1.0
Intersection Summary						
HCM 6th Ctrl Delay			5.9			
HCM 6th LOS			A			

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	0	402	7	0	232
Future Vol, veh/h	3	0	402	7	0	232
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	92	86	58	92	83
Heavy Vehicles, %	1	0	3	14	0	10
Mvmt Flow	4	0	467	12	0	280

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	753	473	0	0	479
Stage 1	473	-	-	-	-
Stage 2	280	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1
Critical Hdwy Stg 1	5.41	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2
Pot Cap-1 Maneuver	379	595	-	-	1094
Stage 1	629	-	-	-	-
Stage 2	770	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	379	595	-	-	1094
Mov Cap-2 Maneuver	379	-	-	-	-
Stage 1	629	-	-	-	-
Stage 2	770	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	379	1094
HCM Lane V/C Ratio	-	-	0.011	-
HCM Control Delay (s)	-	-	14.6	0
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	6	207	259	5	5	5
Future Vol, veh/h	6	207	259	5	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	84	65	63	42	42
Heavy Vehicles, %	1	1	4	1	1	1
Mvmt Flow	12	246	398	8	12	12

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	406	0	-	0	672 402
Stage 1	-	-	-	-	402 -
Stage 2	-	-	-	-	270 -
Critical Hdwy	4.11	-	-	-	6.41 6.21
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.309
Pot Cap-1 Maneuver	1158	-	-	-	423 650
Stage 1	-	-	-	-	678 -
Stage 2	-	-	-	-	778 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1158	-	-	-	418 650
Mov Cap-2 Maneuver	-	-	-	-	418 -
Stage 1	-	-	-	-	670 -
Stage 2	-	-	-	-	778 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	12.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1158	-	-	-	509
HCM Lane V/C Ratio	0.01	-	-	-	0.047
HCM Control Delay (s)	8.1	0	-	-	12.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	192	20	12	161	185	252
Future Volume (veh/h)	192	20	12	161	185	252
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1885	1781	1856	1870	1856
Adj Flow Rate, veh/h	229	43	17	192	289	315
Peak Hour Factor	0.84	0.47	0.69	0.84	0.64	0.80
Percent Heavy Veh, %	1	1	8	3	2	3
Cap, veh/h	354	315	602	648	653	859
Arrive On Green	0.20	0.20	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1795	1598	1038	1856	1870	1572
Grp Volume(v), veh/h	229	43	17	192	289	315
Grp Sat Flow(s),veh/h/ln	1795	1598	1038	1856	1870	1572
Q Serve(g_s), s	2.3	0.4	0.3	1.5	2.4	2.3
Cycle Q Clear(g_c), s	2.3	0.4	2.6	1.5	2.4	2.3
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	354	315	602	648	653	859
V/C Ratio(X)	0.65	0.14	0.03	0.30	0.44	0.37
Avail Cap(c_a), veh/h	2217	1972	1626	2478	2498	2410
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.3	6.6	6.0	4.7	5.0	2.6
Incr Delay (d2), s/veh	2.0	0.2	0.0	0.3	0.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.1	0.0	0.1	0.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.3	6.8	6.0	4.9	5.4	2.8
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	272			209	604	
Approach Delay, s/veh	8.9			5.0	4.1	
Approach LOS	A			A	A	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		11.4		8.4		11.4
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		26.5		24.5		26.5
Max Q Clear Time (g_c+I1), s		4.6		4.3		4.4
Green Ext Time (p_c), s		1.0		0.7		2.6
Intersection Summary						
HCM 6th Ctrl Delay			5.5			
HCM 6th LOS			A			

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	2	346	7	2	425
Future Vol, veh/h	12	2	346	7	2	425
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	43	50	87	35	50	70
Heavy Vehicles, %	8	1	2	1	1	2
Mvmt Flow	28	4	398	20	4	607

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1023	408	0	0	418
Stage 1	408	-	-	-	-
Stage 2	615	-	-	-	-
Critical Hdwy	6.48	6.21	-	-	4.11
Critical Hdwy Stg 1	5.48	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-
Follow-up Hdwy	3.572	3.309	-	-	2.209
Pot Cap-1 Maneuver	254	645	-	-	1146
Stage 1	659	-	-	-	-
Stage 2	528	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	253	645	-	-	1146
Mov Cap-2 Maneuver	253	-	-	-	-
Stage 1	659	-	-	-	-
Stage 2	525	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.9	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	274	1146
HCM Lane V/C Ratio	-	-	0.116	0.003
HCM Control Delay (s)	-	-	19.9	8.2
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.4	0

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	10	380	210	10	10	10
Future Vol, veh/h	10	380	210	10	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	79	81	38	38	63
Heavy Vehicles, %	1	3	3	1	1	20
Mvmt Flow	20	481	259	26	26	16

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	285	0	-	0	793 272
Stage 1	-	-	-	-	272 -
Stage 2	-	-	-	-	521 -
Critical Hdwy	4.11	-	-	-	6.41 6.4
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.48
Pot Cap-1 Maneuver	1283	-	-	-	359 725
Stage 1	-	-	-	-	776 -
Stage 2	-	-	-	-	598 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1283	-	-	-	351 725
Mov Cap-2 Maneuver	-	-	-	-	351 -
Stage 1	-	-	-	-	760 -
Stage 2	-	-	-	-	598 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	14.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1283	-	-	-	436
HCM Lane V/C Ratio	0.016	-	-	-	0.097
HCM Control Delay (s)	7.8	0	-	-	14.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	360	30	10	230	130	210
Future Volume (veh/h)	360	30	10	230	130	210
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1885	1885	1841	1574	1870
Adj Flow Rate, veh/h	429	64	20	267	151	259
Peak Hour Factor	0.84	0.47	0.50	0.86	0.86	0.81
Percent Heavy Veh, %	2	1	1	4	22	2
Cap, veh/h	611	548	548	491	420	967
Arrive On Green	0.34	0.34	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1781	1598	1246	1841	1574	1585
Grp Volume(v), veh/h	429	64	20	267	151	259
Grp Sat Flow(s),veh/h/ln	1781	1598	1246	1841	1574	1585
Q Serve(g_s), s	4.8	0.6	0.3	2.9	1.8	1.8
Cycle Q Clear(g_c), s	4.8	0.6	2.1	2.9	1.8	1.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	611	548	548	491	420	967
V/C Ratio(X)	0.70	0.12	0.04	0.54	0.36	0.27
Avail Cap(c_a), veh/h	2201	1974	1431	1796	1535	2090
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.6	5.2	7.7	7.3	6.9	2.1
Incr Delay (d2), s/veh	1.5	0.1	0.0	0.9	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.1	0.0	0.5	0.2	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.0	5.3	7.7	8.2	7.4	2.2
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	493			287	410	
Approach Delay, s/veh	7.7			8.2	4.1	
Approach LOS	A			A	A	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		10.7		12.4		10.7
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		22.5		28.5		22.5
Max Q Clear Time (g_c+I1), s		4.9		6.8		3.8
Green Ext Time (p_c), s		1.3		1.5		1.5
Intersection Summary						
HCM 6th Ctrl Delay			6.6			
HCM 6th LOS			A			

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	10	0	580	10	0	330
Future Vol, veh/h	10	0	580	10	0	330
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	92	86	58	92	83
Heavy Vehicles, %	1	0	3	14	0	10
Mvmt Flow	13	0	674	17	0	398

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1081	683	0	0	691	0
Stage 1	683	-	-	-	-	-
Stage 2	398	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	242	453	-	-	913	-
Stage 1	503	-	-	-	-	-
Stage 2	681	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	242	453	-	-	913	-
Mov Cap-2 Maneuver	242	-	-	-	-	-
Stage 1	503	-	-	-	-	-
Stage 2	681	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	242	913
HCM Lane V/C Ratio	-	-	0.055	-
HCM Control Delay (s)	-	-	20.7	0
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	10	300	370	10	10	10
Future Vol, veh/h	10	300	370	10	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	84	65	63	42	42
Heavy Vehicles, %	1	1	4	1	1	1
Mvmt Flow	20	357	569	16	24	24

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	585	0	-	0	974 577
Stage 1	-	-	-	-	577 -
Stage 2	-	-	-	-	397 -
Critical Hdwy	4.11	-	-	-	6.41 6.21
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.309
Pot Cap-1 Maneuver	995	-	-	-	280 518
Stage 1	-	-	-	-	564 -
Stage 2	-	-	-	-	681 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	995	-	-	-	273 518
Mov Cap-2 Maneuver	-	-	-	-	273 -
Stage 1	-	-	-	-	550 -
Stage 2	-	-	-	-	681 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	16.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	995	-	-	-	358
HCM Lane V/C Ratio	0.02	-	-	-	0.133
HCM Control Delay (s)	8.7	0	-	-	16.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

HCM 6th Signalized Intersection Summary

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	280	30	20	230	270	360
Future Volume (veh/h)	280	30	20	230	270	360
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1885	1781	1856	1870	1856
Adj Flow Rate, veh/h	337	42	29	274	338	562
Peak Hour Factor	0.83	0.71	0.69	0.84	0.80	0.64
Percent Heavy Veh, %	1	1	8	3	2	3
Cap, veh/h	477	424	534	744	750	1048
Arrive On Green	0.27	0.27	0.40	0.40	0.40	0.40
Sat Flow, veh/h	1795	1598	993	1856	1870	1572
Grp Volume(v), veh/h	337	42	29	274	338	562
Grp Sat Flow(s),veh/h/ln	1795	1598	993	1856	1870	1572
Q Serve(g_s), s	4.6	0.5	0.6	2.8	3.6	5.0
Cycle Q Clear(g_c), s	4.6	0.5	4.2	2.8	3.6	5.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	477	424	534	744	750	1048
V/C Ratio(X)	0.71	0.10	0.05	0.37	0.45	0.54
Avail Cap(c_a), veh/h	1695	1508	1073	1752	1766	1902
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.0	7.5	7.4	5.7	5.9	2.3
Incr Delay (d2), s/veh	1.9	0.1	0.0	0.3	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.1	0.1	0.4	0.5	0.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	10.9	7.6	7.5	6.0	6.3	2.8
LnGrp LOS	B	A	A	A	A	A
Approach Vol, veh/h				303	900	
Approach Delay, s/veh				6.1	4.1	
Approach LOS				A	A	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		15.3		11.7		15.3
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		25.5		25.5		25.5
Max Q Clear Time (g_c+I1), s		6.2		6.6		7.0
Green Ext Time (p_c), s		1.4		1.0		3.8
Intersection Summary						
HCM 6th Ctrl Delay			6.0			
HCM 6th LOS			A			

Intersection						
Int Delay, s/veh	1.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	10	500	10	10	610
Future Vol, veh/h	20	10	500	10	10	610
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	43	50	87	35	50	70
Heavy Vehicles, %	8	1	2	1	1	2
Mvmt Flow	47	20	575	29	20	871

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1501	590	0	0	604
Stage 1	590	-	-	-	-
Stage 2	911	-	-	-	-
Critical Hdwy	6.48	6.21	-	-	4.11
Critical Hdwy Stg 1	5.48	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-
Follow-up Hdwy	3.572	3.309	-	-	2.209
Pot Cap-1 Maneuver	130	509	-	-	979
Stage 1	542	-	-	-	-
Stage 2	383	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	125	509	-	-	979
Mov Cap-2 Maneuver	125	-	-	-	-
Stage 1	542	-	-	-	-
Stage 2	368	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	41.9	0	0.2
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	162	979
HCM Lane V/C Ratio	-	-	0.411	0.02
HCM Control Delay (s)	-	-	41.9	8.8
HCM Lane LOS	-	-	E	A
HCM 95th %tile Q(veh)	-	-	1.8	0.1

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	6	263	149	3	3	5
Future Vol, veh/h	6	263	149	3	3	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	79	81	38	38	63
Heavy Vehicles, %	1	3	3	1	1	20
Mvmt Flow	12	333	184	8	8	8

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	192	0	-	0	545 188
Stage 1	-	-	-	-	188 -
Stage 2	-	-	-	-	357 -
Critical Hdwy	4.11	-	-	-	6.41 6.4
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.48
Pot Cap-1 Maneuver	1388	-	-	-	501 810
Stage 1	-	-	-	-	846 -
Stage 2	-	-	-	-	710 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1388	-	-	-	495 810
Mov Cap-2 Maneuver	-	-	-	-	495 -
Stage 1	-	-	-	-	837 -
Stage 2	-	-	-	-	710 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1388	-	-	-	615
HCM Lane V/C Ratio	0.009	-	-	-	0.026
HCM Control Delay (s)	7.6	0	-	-	11
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection					
Intersection Delay, s/veh	2.7				
Intersection LOS	A				
Approach	EB	NB	SB		
Entry Lanes	1	1	1		
Conflicting Circle Lanes	1	1	1		
Adj Approach Flow, veh/h	332	198	283		
Demand Flow Rate, veh/h	338	205	325		
Vehicles Circulating, veh/h	105	302	12		
Vehicles Exiting, veh/h	12	141	302		
Ped Vol Crossing Leg, #/h	0	0	0		
Ped Cap Adj	1.000	1.000	1.000		
Approach Delay, s/veh	5.4	0.2	1.2		
Approach LOS	A	A	A		
Lane	Left	Left	Bypass	Left	Bypass
Designated Moves	LR	L	R	T	R
Assumed Moves	LR	L	R	T	R
RT Channelized			Free		Free
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	193	4.976	220
Entry Flow, veh/h	338	12	1976	105	2318
Cap Entry Lane, veh/h	1240	1014	0.962	1363	0.820
Entry HV Adj Factor	0.982	1.000	186	0.980	180
Flow Entry, veh/h	332	12	1900	103	1900
Cap Entry, veh/h	1218	1014	0.098	1336	0.095
V/C Ratio	0.273	0.012	0.0	0.077	0.0
Control Delay, s/veh	5.4	3.7	A	3.3	A
LOS	A	A	0	A	0
95th %tile Queue, veh	1	0		0	

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	3	0	402	7	0	232
Future Vol, veh/h	3	0	402	7	0	232
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	92	86	58	92	83
Heavy Vehicles, %	0	0	3	14	0	10
Mvmt Flow	4	0	467	12	0	280

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	753	473	0	0	479
Stage 1	473	-	-	-	-
Stage 2	280	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	380	595	-	-	1094
Stage 1	631	-	-	-	-
Stage 2	772	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	380	595	-	-	1094
Mov Cap-2 Maneuver	380	-	-	-	-
Stage 1	631	-	-	-	-
Stage 2	772	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	380	1094
HCM Lane V/C Ratio	-	-	0.011	-
HCM Control Delay (s)	-	-	14.6	0
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	6	207	259	5	5	5
Future Vol, veh/h	6	207	259	5	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	84	65	63	42	42
Heavy Vehicles, %	1	1	4	1	1	1
Mvmt Flow	12	246	398	8	12	12

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	406	0	-	0	672 402
Stage 1	-	-	-	-	402 -
Stage 2	-	-	-	-	270 -
Critical Hdwy	4.11	-	-	-	6.41 6.21
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.309
Pot Cap-1 Maneuver	1158	-	-	-	423 650
Stage 1	-	-	-	-	678 -
Stage 2	-	-	-	-	778 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1158	-	-	-	418 650
Mov Cap-2 Maneuver	-	-	-	-	418 -
Stage 1	-	-	-	-	670 -
Stage 2	-	-	-	-	778 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	12.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1158	-	-	-	509
HCM Lane V/C Ratio	0.01	-	-	-	0.047
HCM Control Delay (s)	8.1	0	-	-	12.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

HCM 6th Roundabout
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Intersection					
Intersection Delay, s/veh	2.3				
Intersection LOS	A				
Approach	EB	NB	SB		
Entry Lanes	1	1	1		
Conflicting Circle Lanes	1	1	1		
Adj Approach Flow, veh/h	259	209	625		
Demand Flow Rate, veh/h	261	216	640		
Vehicles Circulating, veh/h	238	233	18		
Vehicles Exiting, veh/h	18	266	233		
Ped Vol Crossing Leg, #/h	0	0	0		
Ped Cap Adj	1.000	1.000	1.000		
Approach Delay, s/veh	5.6	0.3	1.6		
Approach LOS	A	A	A		
Lane	Left	Left	Bypass	Left	Bypass
Designated Moves	LR	L	R	T	R
Assumed Moves	LR	L	R	T	R
RT Channelized			Free		Free
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	198	4.976	402
Entry Flow, veh/h	261	18	1957	238	1938
Cap Entry Lane, veh/h	1082	1088	0.971	1355	0.980
Entry HV Adj Factor	0.992	0.944	192	0.971	394
Flow Entry, veh/h	259	17	1900	231	1900
Cap Entry, veh/h	1074	1028	0.101	1315	0.207
V/C Ratio	0.241	0.017	0.0	0.176	0.0
Control Delay, s/veh	5.6	3.6	A	4.2	A
LOS	A	A	0	A	1
95th %tile Queue, veh	1	0		1	

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	2	346	7	2	425
Future Vol, veh/h	12	2	346	7	2	425
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	43	50	87	35	50	70
Heavy Vehicles, %	8	1	2	1	1	2
Mvmt Flow	28	4	398	20	4	607

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1023	408	0	0	418
Stage 1	408	-	-	-	-
Stage 2	615	-	-	-	-
Critical Hdwy	6.48	6.21	-	-	4.11
Critical Hdwy Stg 1	5.48	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-
Follow-up Hdwy	3.572	3.309	-	-	2.209
Pot Cap-1 Maneuver	254	645	-	-	1146
Stage 1	659	-	-	-	-
Stage 2	528	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	253	645	-	-	1146
Mov Cap-2 Maneuver	253	-	-	-	-
Stage 1	659	-	-	-	-
Stage 2	525	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.9	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	274	1146
HCM Lane V/C Ratio	-	-	0.116	0.003
HCM Control Delay (s)	-	-	19.9	8.2
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.4	0

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	10	380	210	10	10	10
Future Vol, veh/h	10	380	210	10	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	79	81	38	38	63
Heavy Vehicles, %	1	3	3	1	1	20
Mvmt Flow	20	481	259	26	26	16

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	285	0	-	0	793 272
Stage 1	-	-	-	-	272 -
Stage 2	-	-	-	-	521 -
Critical Hdwy	4.11	-	-	-	6.41 6.4
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.48
Pot Cap-1 Maneuver	1283	-	-	-	359 725
Stage 1	-	-	-	-	776 -
Stage 2	-	-	-	-	598 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1283	-	-	-	351 725
Mov Cap-2 Maneuver	-	-	-	-	351 -
Stage 1	-	-	-	-	760 -
Stage 2	-	-	-	-	598 -

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	14.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1283	-	-	-	436
HCM Lane V/C Ratio	0.016	-	-	-	0.097
HCM Control Delay (s)	7.8	0	-	-	14.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection					
Intersection Delay, s/veh	3.9				
Intersection LOS	A				
Approach	EB	NB	SB		
Entry Lanes	1	1	1		
Conflicting Circle Lanes	1	1	1		
Adj Approach Flow, veh/h	493	287	410		
Demand Flow Rate, veh/h	503	298	448		
Vehicles Circulating, veh/h	184	438	20		
Vehicles Exiting, veh/h	20	249	438		
Ped Vol Crossing Leg, #/h	0	0	0		
Ped Cap Adj	1.000	1.000	1.000		
Approach Delay, s/veh	7.9	0.3	1.6		
Approach LOS	A	A	A		
Lane	Left	Left	Bypass	Left	Bypass
Designated Moves	LR	L	R	T	R
Assumed Moves	LR	L	R	T	R
RT Channelized			Free		Free
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	278	4.976	264
Entry Flow, veh/h	503	20	1976	184	1938
Cap Entry Lane, veh/h	1144	883	0.962	1352	0.980
Entry HV Adj Factor	0.980	1.000	267	0.820	259
Flow Entry, veh/h	493	20	1900	151	1900
Cap Entry, veh/h	1121	883	0.141	1108	0.136
V/C Ratio	0.440	0.023	0.0	0.136	0.0
Control Delay, s/veh	7.9	4.3	A	4.4	A
LOS	A	A	0	A	0
95th %tile Queue, veh	2	0		0	

HCM 6th TWSC
7: US-377 & Ray Branum Rd

12/19/2023

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	10	0	580	10	0	330
Future Vol, veh/h	10	0	580	10	0	330
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	92	86	58	92	83
Heavy Vehicles, %	1	1	3	14	0	10
Mvmt Flow	13	0	674	17	0	398

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1081	683	0	0	691	0
Stage 1	683	-	-	-	-	-
Stage 2	398	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.2	-
Pot Cap-1 Maneuver	242	451	-	-	913	-
Stage 1	503	-	-	-	-	-
Stage 2	681	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	242	451	-	-	913	-
Mov Cap-2 Maneuver	242	-	-	-	-	-
Stage 1	503	-	-	-	-	-
Stage 2	681	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.7	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	242	913
HCM Lane V/C Ratio	-	-	0.055	-
HCM Control Delay (s)	-	-	20.7	0
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	10	300	370	10	10	10
Future Vol, veh/h	10	300	370	10	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	84	65	63	42	42
Heavy Vehicles, %	1	1	4	1	1	1
Mvmt Flow	20	357	569	16	24	24

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	585	0	-	0	974 577
Stage 1	-	-	-	-	577 -
Stage 2	-	-	-	-	397 -
Critical Hdwy	4.11	-	-	-	6.41 6.21
Critical Hdwy Stg 1	-	-	-	-	5.41 -
Critical Hdwy Stg 2	-	-	-	-	5.41 -
Follow-up Hdwy	2.209	-	-	-	3.509 3.309
Pot Cap-1 Maneuver	995	-	-	-	280 518
Stage 1	-	-	-	-	564 -
Stage 2	-	-	-	-	681 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	995	-	-	-	273 518
Mov Cap-2 Maneuver	-	-	-	-	273 -
Stage 1	-	-	-	-	550 -
Stage 2	-	-	-	-	681 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	16.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	995	-	-	-	358
HCM Lane V/C Ratio	0.02	-	-	-	0.133
HCM Control Delay (s)	8.7	0	-	-	16.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Intersection					
Intersection Delay, s/veh	3.1				
Intersection LOS	A				
Approach	EB	NB	SB		
Entry Lanes	1	1	1		
Conflicting Circle Lanes	1	1	1		
Adj Approach Flow, veh/h	379	303	900		
Demand Flow Rate, veh/h	382	313	924		
Vehicles Circulating, veh/h	345	340	31		
Vehicles Exiting, veh/h	31	387	340		
Ped Vol Crossing Leg, #/h	0	0	0		
Ped Cap Adj	1.000	1.000	1.000		
Approach Delay, s/veh	8.1	0.4	1.9		
Approach LOS	A	A	A		
Lane	Left	Left	Bypass	Left	Bypass
Designated Moves	LR	L	R	T	R
Assumed Moves	LR	L	R	T	R
RT Channelized			Free		Free
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	282	4.976	579
Entry Flow, veh/h	382	31	1957	345	1957
Cap Entry Lane, veh/h	971	976	0.971	1337	0.971
Entry HV Adj Factor	0.992	0.935	274	0.980	562
Flow Entry, veh/h	379	29	1900	338	1900
Cap Entry, veh/h	963	913	0.144	1311	0.296
V/C Ratio	0.394	0.032	0.0	0.258	0.0
Control Delay, s/veh	8.1	4.2	A	5.0	A
LOS	A	A	1	A	1
95th %tile Queue, veh	2	0		1	

Intersection						
Int Delay, s/veh	1.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T			T
Traffic Vol, veh/h	20	10	500	10	10	610
Future Vol, veh/h	20	10	500	10	10	610
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	43	50	87	35	50	70
Heavy Vehicles, %	8	1	2	1	1	2
Mvmt Flow	47	20	575	29	20	871

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1501	590	0	0	604
Stage 1	590	-	-	-	-
Stage 2	911	-	-	-	-
Critical Hdwy	6.48	6.21	-	-	4.11
Critical Hdwy Stg 1	5.48	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-
Follow-up Hdwy	3.572	3.309	-	-	2.209
Pot Cap-1 Maneuver	130	509	-	-	979
Stage 1	542	-	-	-	-
Stage 2	383	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	125	509	-	-	979
Mov Cap-2 Maneuver	125	-	-	-	-
Stage 1	542	-	-	-	-
Stage 2	368	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	41.9	0	0.2
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	162	979
HCM Lane V/C Ratio	-	-	0.411	0.02
HCM Control Delay (s)	-	-	41.9	8.8
HCM Lane LOS	-	-	E	A
HCM 95th %tile Q(veh)	-	-	1.8	0.1

APPENDIX G
TURNING MOVEMENT COUNTS



TDS LLC
11525 Hartwell Lane

Fort Worth, Texas, United States 76244
(405) 762-3924 support@tdstraffic.com

Count Name: Western Ave & Main St TMC
Site Code: 02
Start Date: 09/20/2023
Page No: 1

Turning Movement Data

Start Time	Western Ave Southbound				Main St Westbound				Main St Eastbound				Int. Total
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	
12:00 AM	0	0	0	0	0	5	0	5	3	0	0	3	8
12:15 AM	0	0	0	0	0	1	0	1	2	0	0	2	3
12:30 AM	0	0	0	0	0	0	0	0	8	0	0	8	8
12:45 AM	0	0	0	0	0	4	0	4	2	0	0	2	6
Hourly Total	0	0	0	0	0	10	0	10	15	0	0	15	25
1:00 AM	0	0	0	0	0	3	0	3	2	0	0	2	5
1:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
1:30 AM	0	0	0	0	0	1	0	1	1	0	0	1	2
1:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	5	0	5	3	0	0	3	8
2:00 AM	0	0	0	0	0	1	0	1	1	0	0	1	2
2:15 AM	0	0	0	0	0	1	0	1	1	0	0	1	2
2:30 AM	0	0	0	0	0	1	0	1	1	0	0	1	2
2:45 AM	1	0	0	1	0	1	0	1	0	0	0	0	2
Hourly Total	1	0	0	1	0	4	0	4	3	0	0	3	8
3:00 AM	0	0	0	0	0	5	0	5	2	0	0	2	7
3:15 AM	0	0	0	0	0	1	0	1	2	0	0	2	3
3:30 AM	0	0	0	0	0	2	0	2	1	0	0	1	3
3:45 AM	1	0	0	1	0	2	0	2	3	0	0	3	6
Hourly Total	1	0	0	1	0	10	0	10	8	0	0	8	19
4:00 AM	1	0	0	1	0	5	0	5	3	0	0	3	9
4:15 AM	0	0	0	0	0	6	0	6	2	0	0	2	8
4:30 AM	0	0	0	0	0	4	0	4	7	0	0	7	11
4:45 AM	0	0	0	0	0	4	0	4	4	0	0	4	8
Hourly Total	1	0	0	1	0	19	0	19	16	0	0	16	36
5:00 AM	0	0	0	0	0	13	0	13	5	0	0	5	18
5:15 AM	2	0	0	2	0	7	0	7	7	0	0	7	16
5:30 AM	0	1	0	1	0	16	0	16	6	0	0	6	23
5:45 AM	0	0	0	0	0	11	0	11	17	0	0	17	28
Hourly Total	2	1	0	3	0	47	0	47	35	0	0	35	85
6:00 AM	1	0	0	1	0	8	0	8	17	0	0	17	26
6:15 AM	2	0	0	2	0	7	0	7	23	0	0	23	32
6:30 AM	1	2	0	3	0	15	0	15	14	0	0	14	32
6:45 AM	1	0	0	1	0	20	0	20	28	1	0	29	50
Hourly Total	5	2	0	7	0	50	0	50	82	1	0	83	140
7:00 AM	0	1	0	1	0	25	0	25	38	1	0	39	65

7:15 AM	0	0	0	0	0	34	0	34	59	0	0	59	93
7:30 AM	2	2	0	4	1	33	0	34	74	2	0	76	114
7:45 AM	1	1	0	2	2	43	0	45	54	1	0	55	102
Hourly Total	3	4	0	7	3	135	0	138	225	4	0	229	374
8:00 AM	2	0	0	2	0	33	0	33	57	3	0	60	95
8:15 AM	1	0	0	1	1	17	0	18	45	0	0	45	64
8:30 AM	0	3	0	3	2	15	0	17	35	0	0	35	55
8:45 AM	0	1	0	1	1	30	0	31	40	1	0	41	73
Hourly Total	3	4	0	7	4	95	0	99	177	4	0	181	287
9:00 AM	1	1	0	2	2	30	0	32	31	1	0	32	66
9:15 AM	0	4	0	4	3	34	0	37	26	0	0	26	67
9:30 AM	2	0	0	2	1	27	0	28	58	0	0	58	88
9:45 AM	0	1	0	1	2	31	0	33	41	0	0	41	75
Hourly Total	3	6	0	9	8	122	0	130	156	1	0	157	296
10:00 AM	2	2	0	4	4	30	0	34	17	0	0	17	55
10:15 AM	1	0	0	1	3	22	0	25	31	1	0	32	58
10:30 AM	1	0	0	1	1	31	0	32	33	0	0	33	66
10:45 AM	3	0	0	3	0	24	0	24	33	0	0	33	60
Hourly Total	7	2	0	9	8	107	0	115	114	1	0	115	239
11:00 AM	1	4	0	5	0	38	0	38	44	2	0	46	89
11:15 AM	1	4	0	5	1	33	0	34	43	0	0	43	82
11:30 AM	1	1	0	2	2	38	0	40	29	1	0	30	72
11:45 AM	0	1	0	1	4	42	0	46	37	1	0	38	85
Hourly Total	3	10	0	13	7	151	0	158	153	4	0	157	328
12:00 PM	0	1	0	1	2	50	0	52	37	1	0	38	91
12:15 PM	1	1	0	2	1	37	0	38	30	2	0	32	72
12:30 PM	2	3	0	5	1	35	0	36	33	0	0	33	74
12:45 PM	1	1	0	2	5	35	0	40	52	1	0	53	95
Hourly Total	4	6	0	10	9	157	0	166	152	4	0	156	332
1:00 PM	0	2	0	2	2	43	0	45	32	1	0	33	80
1:15 PM	0	0	0	0	1	35	0	36	28	1	0	29	65
1:30 PM	0	0	0	0	2	36	0	38	46	2	0	48	86
1:45 PM	1	1	0	2	1	35	0	36	25	0	0	25	63
Hourly Total	1	3	0	4	6	149	0	155	131	4	0	135	294
2:00 PM	0	1	0	1	0	32	0	32	28	1	0	29	62
2:15 PM	0	4	0	4	4	36	0	40	34	0	0	34	78
2:30 PM	2	2	0	4	0	37	0	37	34	2	0	36	77
2:45 PM	1	2	0	3	3	45	0	48	41	1	0	42	93
Hourly Total	3	9	0	12	7	150	0	157	137	4	0	141	310
3:00 PM	0	2	0	2	1	55	0	56	39	1	0	40	98
3:15 PM	2	3	0	5	2	62	0	64	37	0	0	37	106
3:30 PM	1	2	0	3	3	51	0	54	44	2	0	46	103
3:45 PM	0	0	0	0	2	51	0	53	37	2	0	39	92
Hourly Total	3	7	0	10	8	219	0	227	157	5	0	162	399
4:00 PM	1	2	0	3	0	56	0	56	33	1	0	34	93
4:15 PM	0	4	0	4	2	39	0	41	39	1	0	40	85
4:30 PM	3	5	0	8	3	41	0	44	39	2	0	41	93
4:45 PM	1	1	0	2	1	37	0	38	51	3	0	54	94
Hourly Total	5	12	0	17	6	173	0	179	162	7	0	169	365
5:00 PM	0	3	0	3	2	96	0	98	54	3	0	57	158
5:15 PM	1	1	0	2	1	70	0	71	37	0	0	37	110
5:30 PM	3	0	0	3	1	44	0	45	44	0	0	44	92

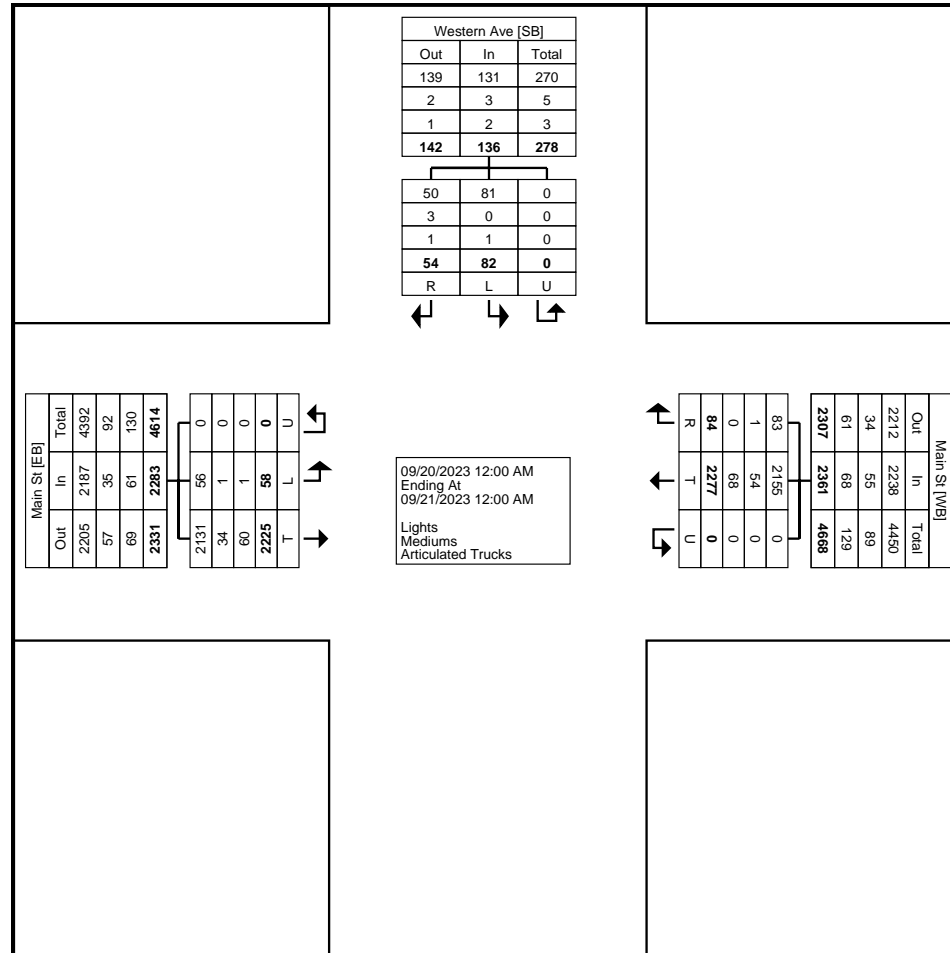
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6:00 PM	0	1	0	1	1	47	0	48	29	1	0	30	79
6:15 PM	1	1	0	2	1	33	0	34	34	0	0	34	70
6:30 PM	0	0	0	0	1	29	0	30	24	1	0	25	55
6:45 PM	0	1	0	1	0	26	0	26	31	0	0	31	58
Hourly Total	1	3	0	4	3	135	0	138	118	2	0	120	262
7:00 PM	0	0	0	0	2	20	0	22	16	0	0	16	38
7:15 PM	0	0	0	0	0	22	0	22	21	2	0	23	45
7:30 PM	0	2	0	2	2	21	0	23	22	2	0	24	49
7:45 PM	0	1	0	1	2	24	0	26	22	1	0	23	50
Hourly Total	0	3	0	3	6	87	0	93	81	5	0	86	182
8:00 PM	0	0	0	0	1	28	0	29	12	0	0	12	41
8:15 PM	0	1	0	1	0	27	0	27	13	2	0	15	43
8:30 PM	0	1	0	1	0	24	0	24	17	0	0	17	42
8:45 PM	1	1	0	2	1	18	0	19	21	1	0	22	43
Hourly Total	1	3	0	4	2	97	0	99	63	3	0	66	169
9:00 PM	0	0	0	0	1	18	0	19	10	0	0	10	29
9:15 PM	0	1	0	1	0	22	0	22	7	2	0	9	32
9:30 PM	0	0	0	0	0	5	0	5	7	1	0	8	13
9:45 PM	0	0	0	0	0	12	0	12	4	0	0	4	16
Hourly Total	0	1	0	1	1	57	0	58	28	3	0	31	90
10:00 PM	0	0	0	0	0	14	0	14	6	0	0	6	20
10:15 PM	1	0	0	1	1	11	0	12	17	0	0	17	30
10:30 PM	0	1	0	1	0	9	0	9	5	0	0	5	15
10:45 PM	1	0	0	1	1	9	0	10	3	0	0	3	14
Hourly Total	2	1	0	3	2	43	0	45	31	0	0	31	79
11:00 PM	0	0	0	0	0	2	0	2	6	1	0	7	9
11:15 PM	0	0	0	0	0	5	0	5	5	0	0	5	10
11:30 PM	0	0	0	0	0	6	0	6	3	0	0	3	9
11:45 PM	0	0	0	0	0	2	0	2	1	0	0	1	3
Hourly Total	0	0	0	0	0	15	0	15	15	1	0	16	31
Grand Total	54	82	0	136	84	2277	0	2361	2225	58	0	2283	4780
Approach %	39.7	60.3	0.0	-	3.6	96.4	0.0	-	97.5	2.5	0.0	-	-
Total %	1.1	1.7	0.0	2.8	1.8	47.6	0.0	49.4	46.5	1.2	0.0	47.8	-
Lights	50	81	0	131	83	2155	0	2238	2131	56	0	2187	4556
% Lights	92.6	98.8	-	96.3	98.8	94.6	-	94.8	95.8	96.6	-	95.8	95.3
Mediums	3	0	0	3	1	54	0	55	34	1	0	35	93
% Mediums	5.6	0.0	-	2.2	1.2	2.4	-	2.3	1.5	1.7	-	1.5	1.9
Articulated Trucks	1	1	0	2	0	68	0	68	60	1	0	61	131
% Articulated Trucks	1.9	1.2	-	1.5	0.0	3.0	-	2.9	2.7	1.7	-	2.7	2.7



TDS LLC
11525 Hartwell Lane

Fort Worth, Texas, United States 76244
(405) 762-3924 support@tdstraff.com

Count Name: Western Ave & Main St TMC
Site Code: 02
Start Date: 09/20/2023
Page No: 4



Turning Movement Data Plot



TDS LLC
11525 Hartwell Lane

Fort Worth, Texas, United States 76244
(405) 762-3924 support@tdstraff.com

Count Name: Western Ave & Main St TMC
Site Code: 02
Start Date: 09/20/2023
Page No: 5

Turning Movement Peak Hour Data (7:15 AM)

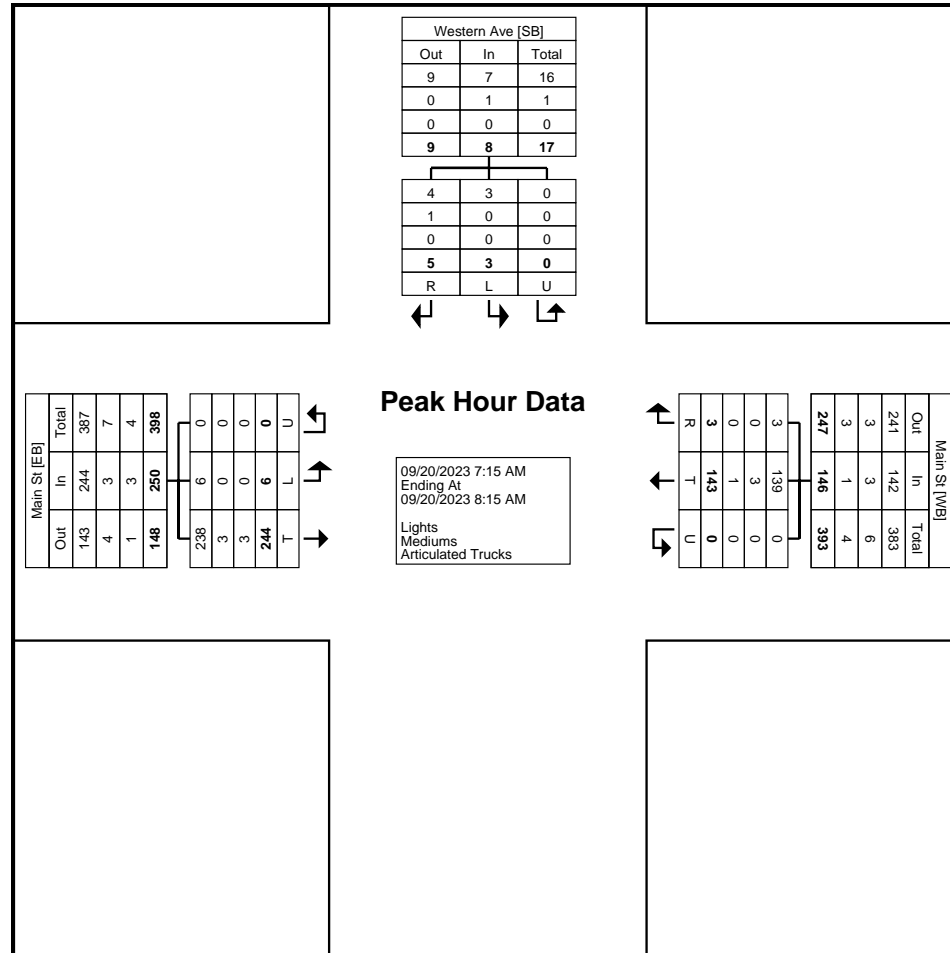
Start Time	Western Ave Southbound				Main St Westbound				Main St Eastbound				Int. Total
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	
7:15 AM	0	0	0	0	0	34	0	34	59	0	0	59	93
7:30 AM	2	2	0	4	1	33	0	34	74	2	0	76	114
7:45 AM	1	1	0	2	2	43	0	45	54	1	0	55	102
8:00 AM	2	0	0	2	0	33	0	33	57	3	0	60	95
Total	5	3	0	8	3	143	0	146	244	6	0	250	404
Approach %	62.5	37.5	0.0	-	2.1	97.9	0.0	-	97.6	2.4	0.0	-	-
Total %	1.2	0.7	0.0	2.0	0.7	35.4	0.0	36.1	60.4	1.5	0.0	61.9	-
PHF	0.625	0.375	0.000	0.500	0.375	0.831	0.000	0.811	0.824	0.500	0.000	0.822	0.886
Lights	4	3	0	7	3	139	0	142	238	6	0	244	393
% Lights	80.0	100.0	-	87.5	100.0	97.2	-	97.3	97.5	100.0	-	97.6	97.3
Mediums	1	0	0	1	0	3	0	3	3	0	0	3	7
% Mediums	20.0	0.0	-	12.5	0.0	2.1	-	2.1	1.2	0.0	-	1.2	1.7
Articulated Trucks	0	0	0	0	0	1	0	1	3	0	0	3	4
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.7	-	0.7	1.2	0.0	-	1.2	1.0



TDS LLC
11525 Hartwell Lane

Fort Worth, Texas, United States 76244
(405) 762-3924 support@tdstraff.com

Count Name: Western Ave & Main St TMC
Site Code: 02
Start Date: 09/20/2023
Page No: 6



Turning Movement Peak Hour Data Plot (7:15 AM)



TDS LLC
11525 Hartwell Lane

Fort Worth, Texas, United States 76244
(405) 762-3924 support@tdstraffic.com

Count Name: Western Ave & Main St TMC
Site Code: 02
Start Date: 09/20/2023
Page No: 7

Turning Movement Peak Hour Data (4:30 PM)

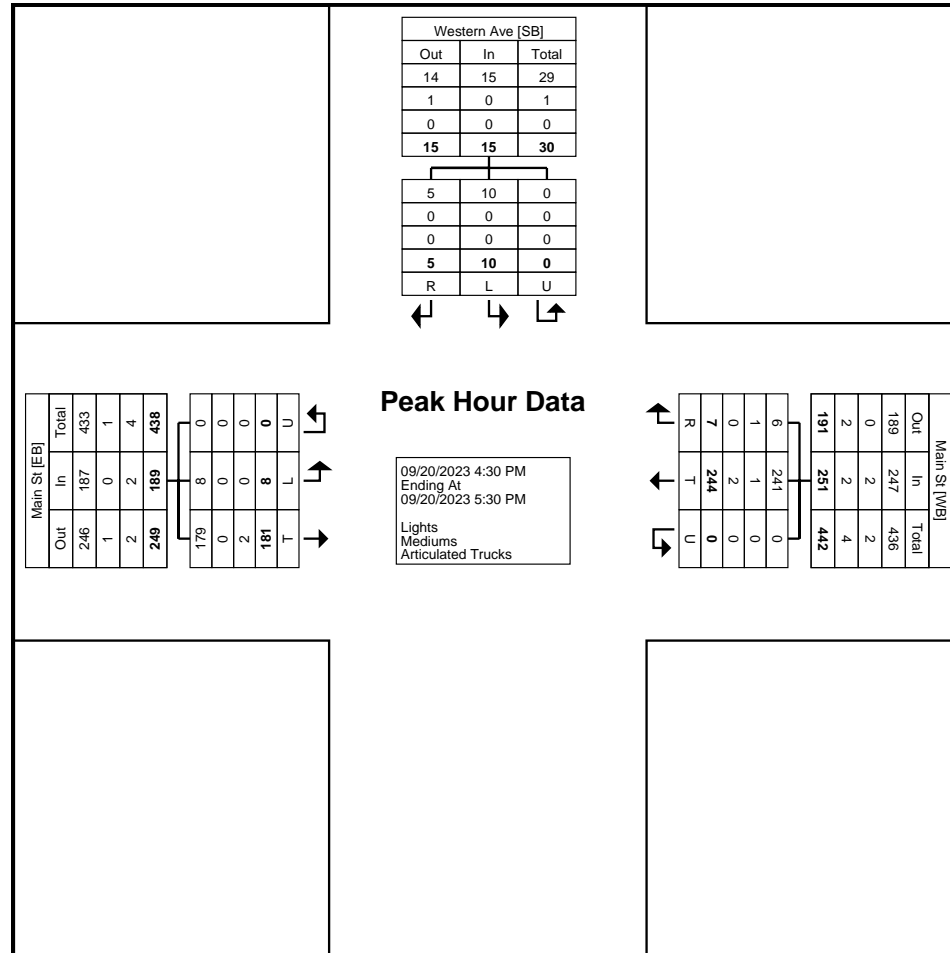
Start Time	Western Ave Southbound				Main St Westbound				Main St Eastbound				Int. Total
	Right	Left	U-Turn	App. Total	Right	Thru	U-Turn	App. Total	Thru	Left	U-Turn	App. Total	
4:30 PM	3	5	0	8	3	41	0	44	39	2	0	41	93
4:45 PM	1	1	0	2	1	37	0	38	51	3	0	54	94
5:00 PM	0	3	0	3	2	96	0	98	54	3	0	57	158
5:15 PM	1	1	0	2	1	70	0	71	37	0	0	37	110
Total	5	10	0	15	7	244	0	251	181	8	0	189	455
Approach %	33.3	66.7	0.0	-	2.8	97.2	0.0	-	95.8	4.2	0.0	-	-
Total %	1.1	2.2	0.0	3.3	1.5	53.6	0.0	55.2	39.8	1.8	0.0	41.5	-
PHF	0.417	0.500	0.000	0.469	0.583	0.635	0.000	0.640	0.838	0.667	0.000	0.829	0.720
Lights	5	10	0	15	6	241	0	247	179	8	0	187	449
% Lights	100.0	100.0	-	100.0	85.7	98.8	-	98.4	98.9	100.0	-	98.9	98.7
Mediums	0	0	0	0	1	1	0	2	0	0	0	0	2
% Mediums	0.0	0.0	-	0.0	14.3	0.4	-	0.8	0.0	0.0	-	0.0	0.4
Articulated Trucks	0	0	0	0	0	2	0	2	2	0	0	2	4
% Articulated Trucks	0.0	0.0	-	0.0	0.0	0.8	-	0.8	1.1	0.0	-	1.1	0.9



TDS LLC
11525 Hartwell Lane

Fort Worth, Texas, United States 76244
(405) 762-3924 support@tdstraff.com

Count Name: Western Ave & Main St TMC
Site Code: 02
Start Date: 09/20/2023
Page No: 8



Turning Movement Peak Hour Data Plot (4:30 PM)

Study Name Wrecker Rd & US 377 ATR
 Start Date 9/20/2023
 Start Time 12:00 AM
 Site Code 4

Channel: Wrecker Rd
 Direction: Southbound

Group	Lights	Mediums	Articulated Trucks
12:00 AM		0	0
12:15 AM		0	0
12:30 AM		0	0
12:45 AM		0	0
1:00 AM		0	0
1:15 AM		0	0
1:30 AM		0	0
1:45 AM		0	0
2:00 AM		0	0
2:15 AM		0	0
2:30 AM		0	0
2:45 AM		0	0
3:00 AM		0	0
3:15 AM		0	0
3:30 AM		0	0
3:45 AM		0	0
4:00 AM		0	0
4:15 AM		2	0
4:30 AM		4	0
4:45 AM		0	0
5:00 AM		2	0
5:15 AM		1	0
5:30 AM		3	1
5:45 AM		6	1
6:00 AM		1	0
6:15 AM		1	0
6:30 AM		2	0
6:45 AM		0	0
7:00 AM		1	0
7:15 AM		2	0
7:30 AM		5	0
7:45 AM		4	0
8:00 AM		0	0
8:15 AM		1	0
8:30 AM		0	0
8:45 AM		3	0

9:00 AM	3	1	6
9:15 AM	0	0	2
9:30 AM	2	0	1
9:45 AM	1	0	0
10:00 AM	1	0	0
10:15 AM	0	0	0
10:30 AM	3	1	0
10:45 AM	2	1	0
11:00 AM	2	0	0
11:15 AM	2	0	0
11:30 AM	0	0	0
11:45 AM	0	0	0
12:00 PM	3	0	0
12:15 PM	2	0	0
12:30 PM	2	3	1
12:45 PM	2	0	0
1:00 PM	3	0	0
1:15 PM	2	0	0
1:30 PM	2	0	0
1:45 PM	1	0	0
2:00 PM	2	0	0
2:15 PM	0	0	0
2:30 PM	3	0	0
2:45 PM	0	0	1
3:00 PM	1	0	0
3:15 PM	7	0	0
3:30 PM	1	1	0
3:45 PM	0	0	0
4:00 PM	0	0	0
4:15 PM	3	0	0
4:30 PM	3	0	0
4:45 PM	4	0	0
5:00 PM	2	0	0
5:15 PM	7	0	0
5:30 PM	5	0	0
5:45 PM	4	0	0
6:00 PM	1	0	0
6:15 PM	2	0	0
6:30 PM	1	0	0
6:45 PM	1	0	0
7:00 PM	2	0	0
7:15 PM	1	0	0
7:30 PM	0	0	0
7:45 PM	1	0	0
8:00 PM	0	0	0
8:15 PM	1	0	0
8:30 PM	0	0	0

8:45 PM	2	0	0
9:00 PM	0	0	0
9:15 PM	0	0	0
9:30 PM	1	0	1
9:45 PM	0	0	0
10:00 PM	2	0	0
10:15 PM	0	0	0
10:30 PM	0	0	0
10:45 PM	0	0	0
11:00 PM	0	0	0
11:15 PM	0	0	0
11:30 PM	0	0	0
11:45 PM	0	0	0

Channel: US 377
Direction: Southbound

Group	Lights	Mediums	Articulated Trucks	
12:00 AM		1	0	1
12:15 AM		1	0	2
12:30 AM		1	0	0
12:45 AM		0	0	0
1:00 AM		0	0	2
1:15 AM		0	0	0
1:30 AM		0	0	0
1:45 AM		0	0	0
2:00 AM		0	0	0
2:15 AM		0	0	0
2:30 AM		0	0	0
2:45 AM		0	0	0
3:00 AM		0	0	1
3:15 AM		1	0	0
3:30 AM		3	0	1
3:45 AM		3	0	1
4:00 AM		3	0	0
4:15 AM		5	0	0
4:30 AM		14	0	0
4:45 AM		6	0	0
5:00 AM		4	0	0
5:15 AM		13	0	0
5:30 AM		5	0	0
5:45 AM		19	0	0
6:00 AM		15	0	0
6:15 AM		17	0	0
6:30 AM		21	1	2
6:45 AM		24	1	3
7:00 AM		17	0	2
7:15 AM		18	0	8

7:30 AM	14	0	5
7:45 AM	15	1	3
8:00 AM	21	0	3
8:15 AM	17	0	1
8:30 AM	12	0	0
8:45 AM	22	0	4
9:00 AM	16	3	0
9:15 AM	14	0	0
9:30 AM	22	0	1
9:45 AM	15	0	4
10:00 AM	22	0	2
10:15 AM	20	1	8
10:30 AM	20	0	4
10:45 AM	15	0	1
11:00 AM	13	1	1
11:15 AM	20	0	0
11:30 AM	17	0	2
11:45 AM	26	0	0
12:00 PM	22	0	1
12:15 PM	18	0	3
12:30 PM	21	0	4
12:45 PM	31	2	2
1:00 PM	17	0	3
1:15 PM	21	0	0
1:30 PM	22	0	1
1:45 PM	23	3	0
2:00 PM	17	0	0
2:15 PM	18	0	0
2:30 PM	25	0	1
2:45 PM	24	0	1
3:00 PM	22	0	2
3:15 PM	25	1	1
3:30 PM	29	0	4
3:45 PM	33	0	0
4:00 PM	22	0	2
4:15 PM	22	2	1
4:30 PM	29	0	0
4:45 PM	25	0	0
5:00 PM	41	0	1
5:15 PM	54	0	0
5:30 PM	52	0	1
5:45 PM	28	0	0
6:00 PM	33	0	0
6:15 PM	16	0	1
6:30 PM	18	0	1
6:45 PM	9	0	0
7:00 PM	7	0	0

7:15 PM	36	0	0
7:30 PM	16	0	0
7:45 PM	15	0	1
8:00 PM	13	1	0
8:15 PM	6	0	0
8:30 PM	5	0	0
8:45 PM	4	0	0
9:00 PM	15	0	0
9:15 PM	8	0	0
9:30 PM	6	0	2
9:45 PM	7	0	0
10:00 PM	1	0	0
10:15 PM	2	0	0
10:30 PM	3	1	0
10:45 PM	2	0	0
11:00 PM	2	1	0
11:15 PM	1	0	0
11:30 PM	0	0	1
11:45 PM	1	0	0

Channel: US-377
Direction: Northbound

Group	Lights	Mediums	Articulated Trucks
12:00 AM		0	0
12:15 AM		0	0
12:30 AM		2	0
12:45 AM		1	0
1:00 AM		0	0
1:15 AM		0	0
1:30 AM		0	0
1:45 AM		0	1
2:00 AM		0	0
2:15 AM		0	1
2:30 AM		1	0
2:45 AM		0	0
3:00 AM		0	0
3:15 AM		0	0
3:30 AM		2	0
3:45 AM		0	2
4:00 AM		0	0
4:15 AM		2	1
4:30 AM		3	0
4:45 AM		0	0
5:00 AM		6	0
5:15 AM		1	2
5:30 AM		2	1
5:45 AM		10	2

6:00 AM	7	0	0
6:15 AM	10	0	3
6:30 AM	13	0	2
6:45 AM	16	0	2
7:00 AM	17	0	2
7:15 AM	37	1	1
7:30 AM	37	1	2
7:45 AM	32	0	0
8:00 AM	26	0	1
8:15 AM	24	0	0
8:30 AM	26	0	2
8:45 AM	23	0	1
9:00 AM	23	0	6
9:15 AM	16	0	2
9:30 AM	21	1	5
9:45 AM	19	1	4
10:00 AM	20	3	2
10:15 AM	21	0	2
10:30 AM	19	1	2
10:45 AM	15	1	2
11:00 AM	20	0	1
11:15 AM	13	1	0
11:30 AM	16	0	2
11:45 AM	28	1	3
12:00 PM	25	0	3
12:15 PM	26	1	3
12:30 PM	15	0	0
12:45 PM	16	0	5
1:00 PM	17	1	1
1:15 PM	22	3	0
1:30 PM	10	0	2
1:45 PM	25	1	1
2:00 PM	23	1	1
2:15 PM	18	0	2
2:30 PM	15	0	4
2:45 PM	16	0	3
3:00 PM	40	0	1
3:15 PM	23	1	3
3:30 PM	23	0	0
3:45 PM	29	0	2
4:00 PM	44	0	1
4:15 PM	25	1	1
4:30 PM	24	0	0
4:45 PM	32	1	1
5:00 PM	29	0	1
5:15 PM	43	0	0
5:30 PM	36	0	1

5:45 PM	26	0	2
6:00 PM	21	0	0
6:15 PM	21	0	1
6:30 PM	13	0	0
6:45 PM	7	0	1
7:00 PM	26	0	0
7:15 PM	8	0	0
7:30 PM	42	0	0
7:45 PM	28	0	0
8:00 PM	15	0	1
8:15 PM	9	0	0
8:30 PM	10	0	0
8:45 PM	10	0	0
9:00 PM	2	0	0
9:15 PM	3	0	0
9:30 PM	5	0	0
9:45 PM	9	0	0
10:00 PM	6	0	0
10:15 PM	2	0	1
10:30 PM	7	0	0
10:45 PM	2	0	0
11:00 PM	4	0	0
11:15 PM	1	0	0
11:30 PM	5	0	0
11:45 PM	2	0	0

Channel: Wrecker Rd
Direction: Northbound

Group	Lights	Mediums	Articulated Trucks
12:00 AM		1	0
12:15 AM		0	0
12:30 AM		0	0
12:45 AM		0	0
1:00 AM		0	0
1:15 AM		0	0
1:30 AM		0	0
1:45 AM		0	0
2:00 AM		0	0
2:15 AM		0	0
2:30 AM		0	0
2:45 AM		0	0
3:00 AM		1	0
3:15 AM		0	0
3:30 AM		0	0
3:45 AM		0	0
4:00 AM		0	0
4:15 AM		0	0

4:30 AM	1	0	0
4:45 AM	0	0	0
5:00 AM	0	0	0
5:15 AM	0	0	0
5:30 AM	2	0	0
5:45 AM	1	0	0
6:00 AM	0	0	0
6:15 AM	0	0	0
6:30 AM	0	0	0
6:45 AM	0	0	0
7:00 AM	3	0	0
7:15 AM	3	0	0
7:30 AM	0	0	0
7:45 AM	1	0	0
8:00 AM	2	0	0
8:15 AM	0	0	0
8:30 AM	2	1	0
8:45 AM	1	0	0
9:00 AM	1	0	0
9:15 AM	0	0	0
9:30 AM	2	0	0
9:45 AM	0	0	0
10:00 AM	0	0	0
10:15 AM	2	0	0
10:30 AM	1	0	0
10:45 AM	2	0	0
11:00 AM	0	0	0
11:15 AM	1	0	1
11:30 AM	0	0	0
11:45 AM	2	0	0
12:00 PM	1	0	0
12:15 PM	2	0	0
12:30 PM	3	0	0
12:45 PM	3	0	0
1:00 PM	1	0	0
1:15 PM	2	0	0
1:30 PM	3	0	0
1:45 PM	1	0	1
2:00 PM	0	0	0
2:15 PM	3	1	0
2:30 PM	0	0	0
2:45 PM	1	0	1
3:00 PM	2	0	0
3:15 PM	2	0	0
3:30 PM	2	0	0
3:45 PM	2	0	0
4:00 PM	1	0	0

4:15 PM	0	0	0
4:30 PM	2	0	0
4:45 PM	3	0	1
5:00 PM	2	0	0
5:15 PM	3	0	0
5:30 PM	2	0	0
5:45 PM	3	0	0
6:00 PM	5	0	0
6:15 PM	2	0	0
6:30 PM	3	0	0
6:45 PM	2	0	0
7:00 PM	1	0	0
7:15 PM	1	0	0
7:30 PM	11	0	0
7:45 PM	2	0	0
8:00 PM	0	0	0
8:15 PM	0	0	0
8:30 PM	0	0	0
8:45 PM	1	0	0
9:00 PM	0	0	0
9:15 PM	0	0	0
9:30 PM	2	0	0
9:45 PM	0	0	0
10:00 PM	0	0	0
10:15 PM	1	0	0
10:30 PM	1	0	0
10:45 PM	0	0	0
11:00 PM	2	0	0
11:15 PM	0	0	0
11:30 PM	0	0	0
11:45 PM	0	0	0

Study Name W Main St & Wrecker Rd ATR
 Start Date 9/20/2023
 Start Time 12:00 AM
 Site Code 1

Channel: W Main St
 Direction: Westbound

Group	Lights	Mediums	Articulated Trucks
12:00 AM		5	0
12:15 AM		1	0
12:30 AM		0	0
12:45 AM		3	0
1:00 AM		5	0
1:15 AM		1	0
1:30 AM		0	0
1:45 AM		1	0
2:00 AM		1	0
2:15 AM		1	0
2:30 AM		1	0
2:45 AM		1	0
3:00 AM		3	0
3:15 AM		1	0
3:30 AM		2	0
3:45 AM		2	0
4:00 AM		6	0
4:15 AM		5	0
4:30 AM		3	0
4:45 AM		7	0
5:00 AM		11	0
5:15 AM		8	0
5:30 AM		10	0
5:45 AM		16	1
6:00 AM		11	0
6:15 AM		8	0
6:30 AM		13	0
6:45 AM		21	0
7:00 AM		22	0
7:15 AM		36	0
7:30 AM		36	0
7:45 AM		37	2
8:00 AM		34	1
8:15 AM		22	1
8:30 AM		15	0
8:45 AM		21	2

9:00 AM	29	0	2
9:15 AM	33	1	0
9:30 AM	29	0	3
9:45 AM	29	0	2
10:00 AM	25	0	3
10:15 AM	24	0	2
10:30 AM	24	3	2
10:45 AM	27	0	1
11:00 AM	36	2	1
11:15 AM	30	1	2
11:30 AM	31	1	6
11:45 AM	35	1	1
12:00 PM	49	3	4
12:15 PM	36	0	1
12:30 PM	38	0	1
12:45 PM	27	4	1
1:00 PM	38	5	0
1:15 PM	34	0	0
1:30 PM	30	3	1
1:45 PM	28	2	0
2:00 PM	37	1	1
2:15 PM	28	0	3
2:30 PM	39	0	3
2:45 PM	33	4	1
3:00 PM	55	0	2
3:15 PM	61	3	1
3:30 PM	48	0	0
3:45 PM	48	3	0
4:00 PM	61	1	1
4:15 PM	34	0	1
4:30 PM	46	0	0
4:45 PM	33	0	1
5:00 PM	91	0	1
5:15 PM	76	0	0
5:30 PM	40	3	3
5:45 PM	34	1	1
6:00 PM	41	0	0
6:15 PM	35	0	0
6:30 PM	28	3	0
6:45 PM	26	0	0
7:00 PM	23	0	0
7:15 PM	19	0	0
7:30 PM	19	0	2
7:45 PM	25	0	0
8:00 PM	31	0	0
8:15 PM	18	0	0
8:30 PM	23	0	0

8:45 PM	22	0	0
9:00 PM	18	0	0
9:15 PM	19	0	0
9:30 PM	6	0	0
9:45 PM	9	1	0
10:00 PM	13	1	0
10:15 PM	14	0	0
10:30 PM	8	0	0
10:45 PM	9	0	0
11:00 PM	3	0	0
11:15 PM	6	0	0
11:30 PM	4	0	1
11:45 PM	2	0	0

Channel: Wrecker Rd

Direction: Westbound

Group	Lights	Mediums	Articulated Trucks
12:00 AM		1	0
12:15 AM		0	0
12:30 AM		0	0
12:45 AM		0	0
1:00 AM		0	0
1:15 AM		0	0
1:30 AM		0	0
1:45 AM		0	0
2:00 AM		0	0
2:15 AM		0	0
2:30 AM		0	0
2:45 AM		0	0
3:00 AM		1	0
3:15 AM		0	0
3:30 AM		0	0
3:45 AM		0	0
4:00 AM		0	0
4:15 AM		0	0
4:30 AM		1	0
4:45 AM		0	0
5:00 AM		0	0
5:15 AM		0	0
5:30 AM		1	0
5:45 AM		2	0
6:00 AM		0	0
6:15 AM		0	0
6:30 AM		0	0
6:45 AM		0	0
7:00 AM		4	0
7:15 AM		2	0

7:30 AM	1	0	0
7:45 AM	0	0	0
8:00 AM	3	0	0
8:15 AM	0	0	0
8:30 AM	4	1	0
8:45 AM	1	0	0
9:00 AM	0	0	0
9:15 AM	0	0	0
9:30 AM	2	0	0
9:45 AM	0	0	0
10:00 AM	1	0	0
10:15 AM	2	0	0
10:30 AM	1	0	0
10:45 AM	1	0	0
11:00 AM	1	0	0
11:15 AM	1	0	1
11:30 AM	1	0	0
11:45 AM	0	0	0
12:00 PM	2	0	0
12:15 PM	3	0	0
12:30 PM	4	0	0
12:45 PM	3	0	0
1:00 PM	0	0	0
1:15 PM	3	0	0
1:30 PM	3	0	0
1:45 PM	1	0	1
2:00 PM	1	0	0
2:15 PM	3	1	0
2:30 PM	2	0	0
2:45 PM	2	0	0
3:00 PM	3	0	1
3:15 PM	3	0	0
3:30 PM	5	0	0
3:45 PM	2	0	0
4:00 PM	1	0	0
4:15 PM	0	0	0
4:30 PM	4	0	0
4:45 PM	3	0	1
5:00 PM	3	0	0
5:15 PM	3	0	0
5:30 PM	2	0	0
5:45 PM	3	0	0
6:00 PM	5	0	0
6:15 PM	1	0	0
6:30 PM	2	0	0
6:45 PM	3	0	0
7:00 PM	2	0	0

7:15 PM	1	0	0
7:30 PM	16	0	0
7:45 PM	2	0	0
8:00 PM	0	0	0
8:15 PM	2	0	0
8:30 PM	0	0	0
8:45 PM	0	0	0
9:00 PM	0	0	0
9:15 PM	0	0	0
9:30 PM	1	0	0
9:45 PM	3	0	0
10:00 PM	0	0	0
10:15 PM	0	0	0
10:30 PM	2	0	0
10:45 PM	0	0	0
11:00 PM	1	0	0
11:15 PM	0	0	0
11:30 PM	0	0	0
11:45 PM	0	0	0

Channel: Wrecker Rd

Direction: Eastbound

Group	Lights	Mediums	Articulated Trucks
12:00 AM		0	0
12:15 AM		0	1
12:30 AM		0	0
12:45 AM		0	0
1:00 AM		0	0
1:15 AM		0	0
1:30 AM		0	0
1:45 AM		0	0
2:00 AM		0	0
2:15 AM		0	0
2:30 AM		0	0
2:45 AM		0	0
3:00 AM		0	0
3:15 AM		0	0
3:30 AM		0	0
3:45 AM		0	0
4:00 AM		0	0
4:15 AM		2	0
4:30 AM		4	0
4:45 AM		0	0
5:00 AM		0	0
5:15 AM		0	0
5:30 AM		0	0
5:45 AM		5	0

6:00 AM	1	1	0
6:15 AM	1	0	1
6:30 AM	3	0	1
6:45 AM	0	0	0
7:00 AM	2	0	0
7:15 AM	3	0	0
7:30 AM	8	0	1
7:45 AM	4	0	0
8:00 AM	1	0	0
8:15 AM	3	4	2
8:30 AM	1	1	0
8:45 AM	3	0	0
9:00 AM	3	0	6
9:15 AM	0	0	3
9:30 AM	2	0	1
9:45 AM	1	1	0
10:00 AM	1	0	0
10:15 AM	0	0	0
10:30 AM	4	0	0
10:45 AM	3	1	0
11:00 AM	4	0	0
11:15 AM	3	0	0
11:30 AM	2	0	0
11:45 AM	1	0	0
12:00 PM	2	0	0
12:15 PM	5	2	0
12:30 PM	2	4	1
12:45 PM	1	0	0
1:00 PM	5	1	0
1:15 PM	3	0	0
1:30 PM	2	0	0
1:45 PM	2	4	0
2:00 PM	2	0	0
2:15 PM	0	0	0
2:30 PM	3	1	0
2:45 PM	0	0	2
3:00 PM	1	0	0
3:15 PM	9	0	0
3:30 PM	2	1	0
3:45 PM	1	0	0
4:00 PM	0	0	0
4:15 PM	2	0	0
4:30 PM	4	1	0
4:45 PM	4	0	0
5:00 PM	2	0	0
5:15 PM	7	0	0
5:30 PM	7	0	0

5:45 PM	5	0	0
6:00 PM	3	0	0
6:15 PM	5	0	0
6:30 PM	1	0	0
6:45 PM	1	0	0
7:00 PM	2	0	0
7:15 PM	1	0	0
7:30 PM	0	0	0
7:45 PM	1	0	0
8:00 PM	0	0	0
8:15 PM	2	0	0
8:30 PM	0	0	0
8:45 PM	2	0	0
9:00 PM	0	0	0
9:15 PM	1	0	0
9:30 PM	2	0	0
9:45 PM	0	0	0
10:00 PM	0	0	0
10:15 PM	0	0	0
10:30 PM	0	0	0
10:45 PM	0	0	0
11:00 PM	0	0	0
11:15 PM	0	0	0
11:30 PM	0	0	0
11:45 PM	0	0	0

Channel: W Main St

Direction: Eastbound

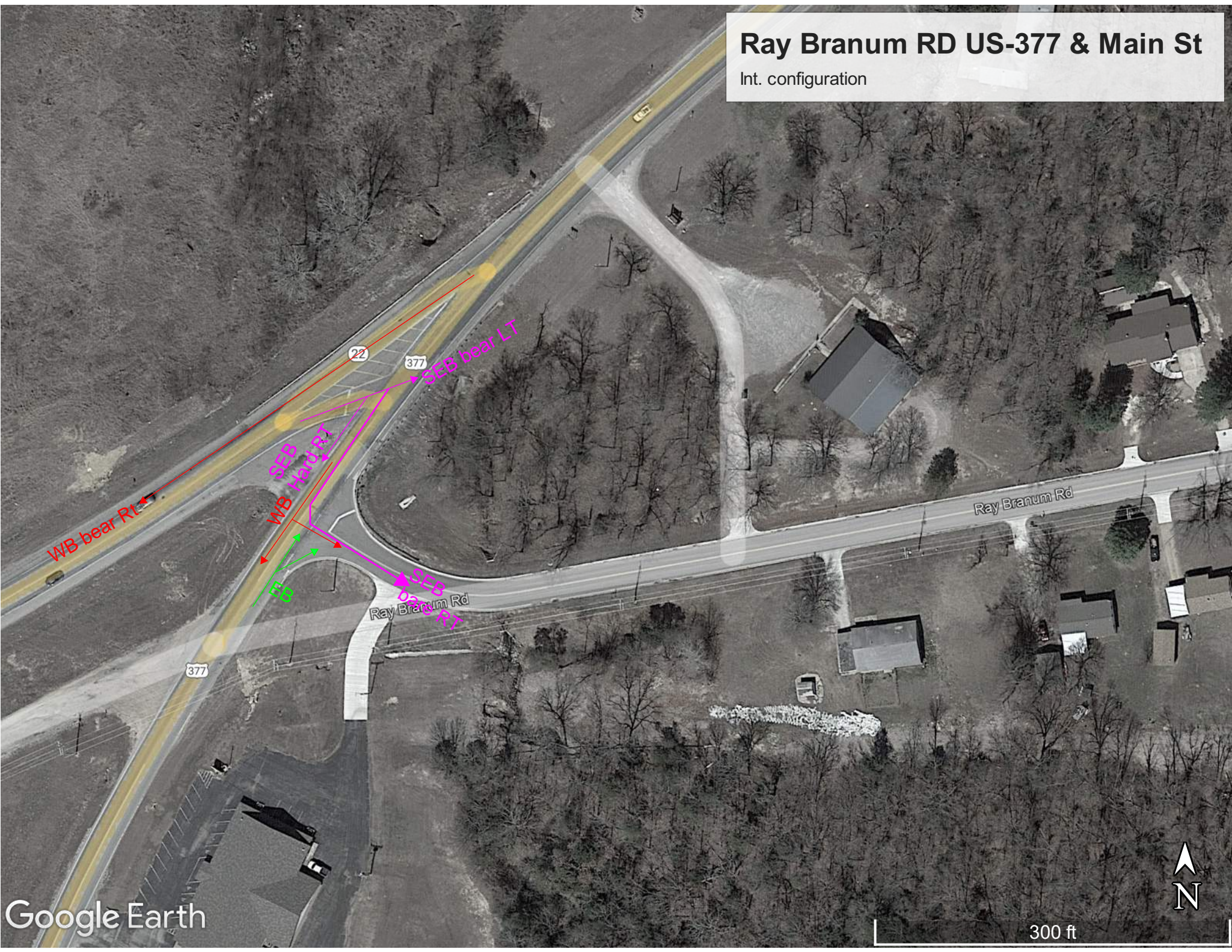
Group	Lights	Mediums	Articulated Trucks
12:00 AM		2	0
12:15 AM		3	0
12:30 AM		8	0
12:45 AM		2	0
1:00 AM		2	0
1:15 AM		0	0
1:30 AM		1	0
1:45 AM		0	0
2:00 AM		1	0
2:15 AM		1	0
2:30 AM		1	0
2:45 AM		0	0
3:00 AM		2	0
3:15 AM		2	0
3:30 AM		1	0
3:45 AM		2	0
4:00 AM		3	1
4:15 AM		2	0

4:30 AM	8	0	0
4:45 AM	3	0	1
5:00 AM	4	0	0
5:15 AM	7	0	0
5:30 AM	6	0	1
5:45 AM	14	0	1
6:00 AM	16	0	2
6:15 AM	21	0	1
6:30 AM	14	0	0
6:45 AM	26	1	0
7:00 AM	38	0	1
7:15 AM	57	0	0
7:30 AM	71	0	0
7:45 AM	55	1	1
8:00 AM	58	1	1
8:15 AM	42	0	3
8:30 AM	31	0	1
8:45 AM	42	1	3
9:00 AM	30	0	1
9:15 AM	26	2	0
9:30 AM	53	1	5
9:45 AM	37	1	1
10:00 AM	16	1	2
10:15 AM	29	0	0
10:30 AM	31	1	0
10:45 AM	32	1	1
11:00 AM	42	1	2
11:15 AM	42	0	2
11:30 AM	29	1	0
11:45 AM	38	1	1
12:00 PM	34	1	1
12:15 PM	27	1	0
12:30 PM	35	1	2
12:45 PM	44	2	2
1:00 PM	35	1	0
1:15 PM	26	1	1
1:30 PM	41	2	1
1:45 PM	25	1	1
2:00 PM	26	1	1
2:15 PM	35	0	1
2:30 PM	31	0	0
2:45 PM	43	0	0
3:00 PM	35	1	1
3:15 PM	39	0	1
3:30 PM	41	1	2
3:45 PM	37	1	2
4:00 PM	31	0	1

4:15 PM	42	1	0
4:30 PM	41	0	0
4:45 PM	47	0	1
5:00 PM	57	0	0
5:15 PM	35	0	0
5:30 PM	44	1	1
5:45 PM	30	0	0
6:00 PM	32	0	1
6:15 PM	28	0	0
6:30 PM	31	0	1
6:45 PM	30	0	0
7:00 PM	15	0	0
7:15 PM	23	0	1
7:30 PM	19	1	0
7:45 PM	22	1	0
8:00 PM	9	0	1
8:15 PM	12	1	0
8:30 PM	15	0	0
8:45 PM	16	0	1
9:00 PM	14	0	0
9:15 PM	9	0	0
9:30 PM	7	0	1
9:45 PM	4	0	0
10:00 PM	6	0	0
10:15 PM	14	0	0
10:30 PM	6	1	0
10:45 PM	4	0	0
11:00 PM	7	0	0
11:15 PM	2	0	0
11:30 PM	6	0	0
11:45 PM	1	0	0

Ray Branum RD US-377 & Main St

Int. configuration



Study Name Ray Branum Rd & US 377/Main St TMC
 Start Date 9/20/2023
 Start Time 12:00 AM
 Site Code 3

Lights

Start Time	Westbound US 377				Northbound Ray Branum Rd				Eastbound US 377				Southeastbound Main St			
	Bear Right	Thru	Left	U-Turn	Right	Bear Left	Left	U-Turn	Right	Thru	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	U-Turn
12:00 AM	5	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0
12:15 AM	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2
12:30 AM	1	1	0	0	0	0	1	0	0	2	0	0	0	0	0	8
12:45 AM	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
1:00 AM	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
1:15 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 AM	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
2:30 AM	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
2:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
3:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:30 AM	1	2	0	0	0	0	0	0	0	2	0	0	0	0	0	1
3:45 AM	2	4	0	0	0	0	0	0	0	2	0	0	0	0	0	3
4:00 AM	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:15 AM	6	4	0	0	0	0	0	0	0	2	0	0	0	0	0	2
4:30 AM	5	15	0	0	0	0	0	0	0	3	0	0	0	0	0	5
4:45 AM	5	7	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:00 AM	10	4	0	0	0	0	0	0	0	6	0	0	0	0	0	5
5:15 AM	6	11	0	0	0	0	0	0	0	2	0	0	0	0	0	7
5:30 AM	15	8	0	0	0	0	0	0	0	2	0	0	0	0	0	6
5:45 AM	10	16	0	0	0	0	0	0	0	11	0	0	0	1	0	15
6:00 AM	9	16	0	0	0	0	0	0	1	6	0	0	0	0	0	14
6:15 AM	8	17	0	0	0	0	1	0	0	9	0	0	0	1	0	20
6:30 AM	12	19	0	0	0	0	0	0	0	15	0	0	0	0	0	15
6:45 AM	19	22	0	0	0	0	1	0	1	15	0	0	0	0	0	29
7:00 AM	25	19	0	0	0	0	2	0	0	17	0	0	0	0	0	31
7:15 AM	34	17	0	0	0	0	1	0	3	37	0	0	0	0	0	58
7:30 AM	33	14	0	0	0	0	0	0	2	40	0	0	0	0	0	73
7:45 AM	43	15	0	0	0	0	1	0	1	42	0	0	0	0	0	58
8:00 AM	30	20	0	0	0	0	1	0	0	28	0	0	0	0	0	55
8:15 AM	18	17	0	0	0	1	1	0	2	24	0	0	0	0	0	40
8:30 AM	16	11	2	0	0	0	1	0	2	23	0	0	0	0	0	38
8:45 AM	30	20	0	0	0	0	2	0	1	22	0	0	0	0	0	38
9:00 AM	27	14	0	0	0	0	0	0	1	21	0	0	0	0	0	31
9:15 AM	36	14	0	0	0	0	1	0	0	16	0	0	0	0	0	28
9:30 AM	22	22	0	0	0	0	1	0	1	23	0	0	0	0	0	53
9:45 AM	31	14	0	0	0	0	0	0	0	20	0	0	0	0	0	40
10:00 AM	32	24	1	0	0	0	1	0	0	19	0	0	0	0	0	17
10:15 AM	23	16	0	0	1	0	0	0	0	21	0	0	0	0	0	31
10:30 AM	27	22	0	0	0	0	1	0	1	18	0	0	0	0	0	35
10:45 AM	22	16	0	0	0	0	0	0	0	21	0	0	0	0	0	31
11:00 AM	35	11	0	0	0	0	1	0	2	23	0	0	0	0	0	44
11:15 AM	30	21	1	0	0	0	0	0	1	12	0	0	0	0	0	45
11:30 AM	33	17	0	0	1	0	1	0	0	17	0	0	0	0	0	26
11:45 AM	42	23	0	0	0	0	2	0	0	30	0	0	0	0	0	37
12:00 PM	44	26	1	0	0	0	1	0	2	24	0	0	0	0	0	37
12:15 PM	37	19	0	0	1	0	3	0	2	25	0	0	0	0	0	28
12:30 PM	31	15	0	0	0	0	1	0	1	17	0	0	0	1	0	34
12:45 PM	35	28	0	0	0	0	5	0	1	15	0	0	0	0	0	48
1:00 PM	41	13	0	0	0	0	2	0	1	18	0	0	0	0	0	34
1:15 PM	32	21	0	0	0	0	2	0	1	23	0	0	0	0	0	24
1:30 PM	36	21	0	0	0	0	0	0	0	9	0	0	0	0	0	41
1:45 PM	29	23	1	0	0	0	1	0	0	26	0	0	0	0	0	26
2:00 PM	27	16	3	0	0	0	2	0	2	22	0	0	0	0	0	27
2:15 PM	31	14	0	0	0	1	1	0	0	17	0	0	0	0	1	36
2:30 PM	30	24	0	0	0	0	3	0	0	14	0	0	0	0	0	36
2:45 PM	42	24	0	0	0	0	0	0	1	19	0	0	0	0	0	41
3:00 PM	50	21	0	0	0	0	3	0	1	40	0	0	0	0	1	38
3:15 PM	63	28	0	0	0	0	4	0	3	28	0	0	0	0	0	36
3:30 PM	55	26	1	0	0	0	1	0	0	23	0	0	0	0	0	42
3:45 PM	50	33	1	0	0	0	2	0	2	27	0	0	0	0	0	31
4:00 PM	48	21	0	0	0	0	1	0	1	43	0	0	0	0	0	37
4:15 PM	40	17	0	0	0	0	5	0	3	23	0	0	0	0	0	43
4:30 PM	43	29	0	0	0	0	4	0	1	23	0	0	0	0	0	44
4:45 PM	37	26	1	0	1	0	1	0	0	35	0	0	0	0	0	50

12:00 PM	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
12:15 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	1	0
12:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0
12:45 PM	5	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0
1:00 PM	4	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0
1:30 PM	3	0	0	0	0	0	0	0	0	1	0	0	0	0	3	0
1:45 PM	4	0	0	0	1	0	0	0	0	4	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
2:45 PM	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
3:15 PM	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
3:45 PM	2	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0
4:00 PM	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	1	1	0	0	0	0	0	0	0	1	0	0	0	0	1	0
4:30 PM	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	2	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
10:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Articulated Trucks

Start Time	Westbound US 377				Northbound Ray Branum Rd				Eastbound US 377				Southeastbound Main St			
	Bear Right	Thru	Left	U-Turn	Right	Bear Left	Left	U-Turn	Right	Thru	Hard Left	U-Turn	Hard Right	Bear Right	Bear Left	U-Turn
12:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
4:30 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 AM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5:00 AM	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
5:30 AM	3	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0
5:45 AM	1	1	0	0	0	0	0	0	0	3	0	0	0	0	1	0
6:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0
6:15 AM	1	0	0	0	0	0	0	0	0	4	0	0	0	0	3	0
6:30 AM	2	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0
6:45 AM	1	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0

APPENDIX H
COLLISION DATA PROVIDED BY ODOT



Program Provided by:
 Traffic Engineering Division
 Collision Analysis and Safety Branch
 (405) 522-0985
 Created: 11/13/2023
 by Stephen Waldrop

Study Map & Totals

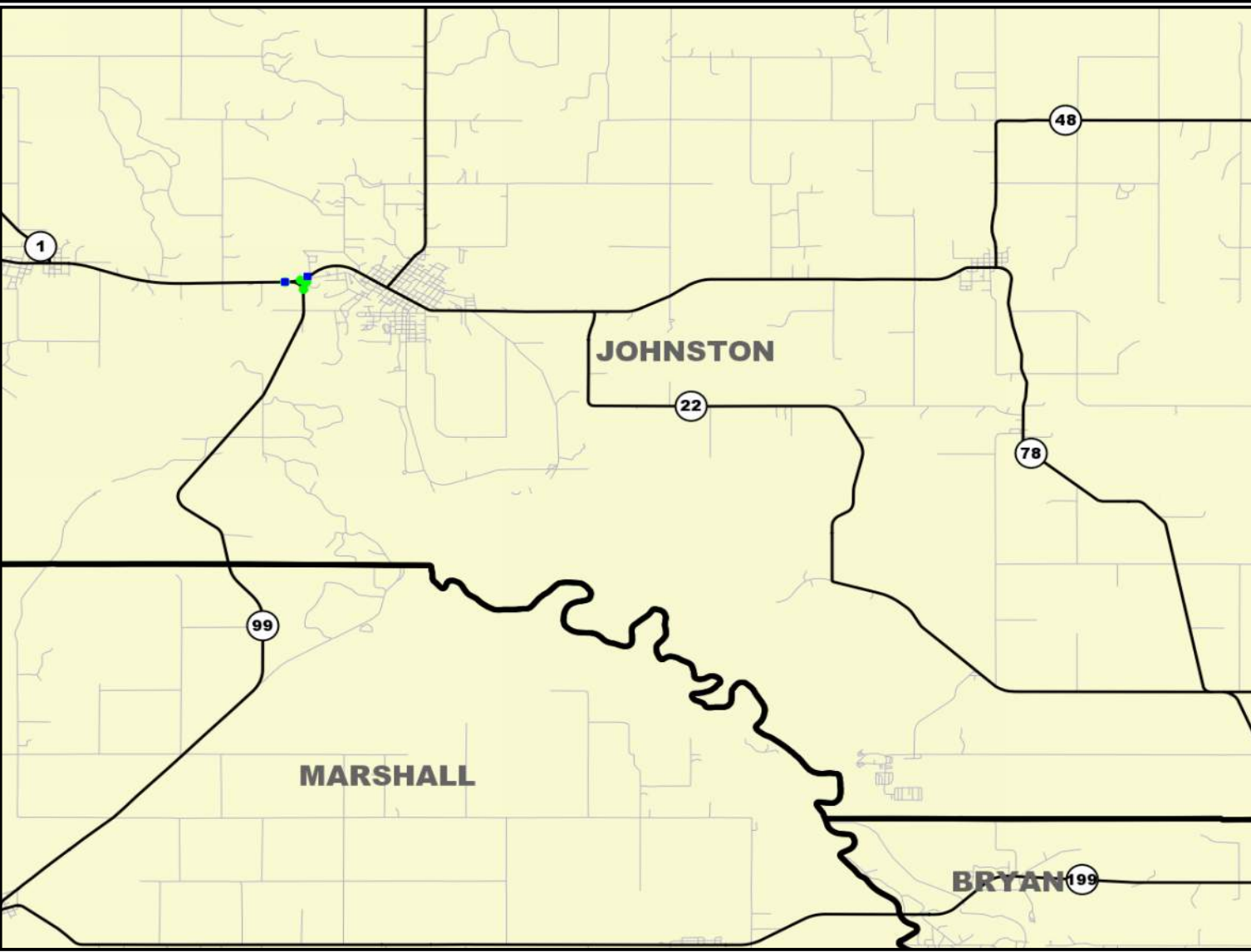
Legend

	Fatality
	Injury
	Property Damage



Remarks:

NONE



Date Range: 01-01-2017 thru 12-31-2021

	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	1			1			1				1	2	3
Persons						0			1	2		3				1		1



STUDY TOTALS (CONT.)

Date Range: 01-01-2017 Thru 12-31-2021

Program Provided by:
 Traffic Engineering Division
 Collision Analysis and Safety Branch
 (405) 522-0985
 Created: 11/13/2023 by Stephen Waldrop

	2020						2021*					
	Fat	SRS Inj	Non-Incap Inj	Poss Inj	PD	Tot	Fat	SRS Inj	Non-Incap Inj	Poss Inj	PD	Tot
Collisions					2	2						0
Persons						0						0

* DENOTES A YEAR FOR WHICH DATA MAY BE INCOMPLETE.

	Study Total					Total
	Fatality	Suspected Serious Injury	Non-Incapacitating Injury	Possible Injury	Property Damage	
Collisions			1	1	5	7
Persons			1	3		4



STUDY TOTALS - BY CITY AND HWY CLASS

Date Range: 01-01-2017 Thru 12-31-2021

Program Provided by:
 Traffic Engineering Division
 Collision Analysis and Safety Branch
 (405) 522-0985
 Created: 11/13/2023 by Stephen Waldrop

STUDY TOTALS

Year	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
2017			1	1											1	1
2018		1		1										1		1
2019		1	2	3										1	2	3
2020			2	2											2	2
Total:		2	5	7				0				0		2	5	7

County: (35) JOHNSTON

(30) TISHOMINGO	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
		2	5	7										2	5	7

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



TABULATION OF COLLISIONS

Date Range: 01-01-2017 Thru 12-31-2021

Program Provided by:
 Traffic Engineering Division
 Collision Analysis and Safety Branch
 (405) 522-0985
 Created: 11/13/2023 by Stephen Waldrop

Collisions By Type Of Collision

Type Of Collision	2017				2018				2019				2020				2021*			
	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			1	1				
Head-On (front-to-front)																				
Right Angle (front-to-side)			1	1											1	1				
Angle Turning						1		1			1	1								
Other Angle																				
Sideswipe Same Direction																				
Sideswipe Opposite Direction																				
Fixed Object										1		1								
Pedestrian																				
Pedal Cycle																				
Animal																				
Overturn/Rollover																				
Vehicle-Train																				
Other Single Vehicle Crash																				
Other																				
Total			1	1		1		1		1	2	3			2	2				
Percent			14.3	14.3		14.3		14.3		14.3	28.6	42.9			28.6	28.6				

Collisions By Type Of Collision

Type Of Collision	Total				
	Fat	Inj *	PD	Tot	Pct
Rear-End (front-to-rear)			2	2	28.6
Head-On (front-to-front)					
Right Angle (front-to-side)			2	2	28.6
Angle Turning		1	1	2	28.6
Other Angle					
Sideswipe Same Direction					
Sideswipe Opposite Direction					
Fixed Object		1		1	14.3
Pedestrian					
Pedal Cycle					
Animal					
Overturn/Rollover					
Vehicle-Train					
Other Single Vehicle Crash					
Other					
Total		2	5	7	100
Percent		28.6	71.4	100	

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



TABULATION OF COLLISIONS

Date Range: 01-01-2017 Thru 12-31-2021

Program Provided by:
 Traffic Engineering Division
 Collision Analysis and Safety Branch
 (405) 522-0985
 Created: 11/13/2023 by Stephen Waldrop

USE RESTRICTED

Units By Unit Type

Unit Type	2017				2018				2019				2020				2021*			
	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																				
Other Single Vehicle										1		1								
Other Multi-Vehicle			2	2		2		2			4	4			4	4				
Total			2	2		2		2		1	4	5			4	4				
Percent			15.4	15.4		15.4		15.4		7.7	30.8	38.5			30.8	30.8				

Units By Unit Type

Unit Type	Total				
	Fat	Inj *	PD	Tot	Pct
Train					
Pedestrian					
Animal					
Pedal Cycle					
Parked Vehicle					
CMV					
Other Single Vehicle		1		1	7.7
Other Multi-Vehicle		2	10	12	92.3
Total		3	10	13	100
Percent		23.1	76.9	100	

USC 409

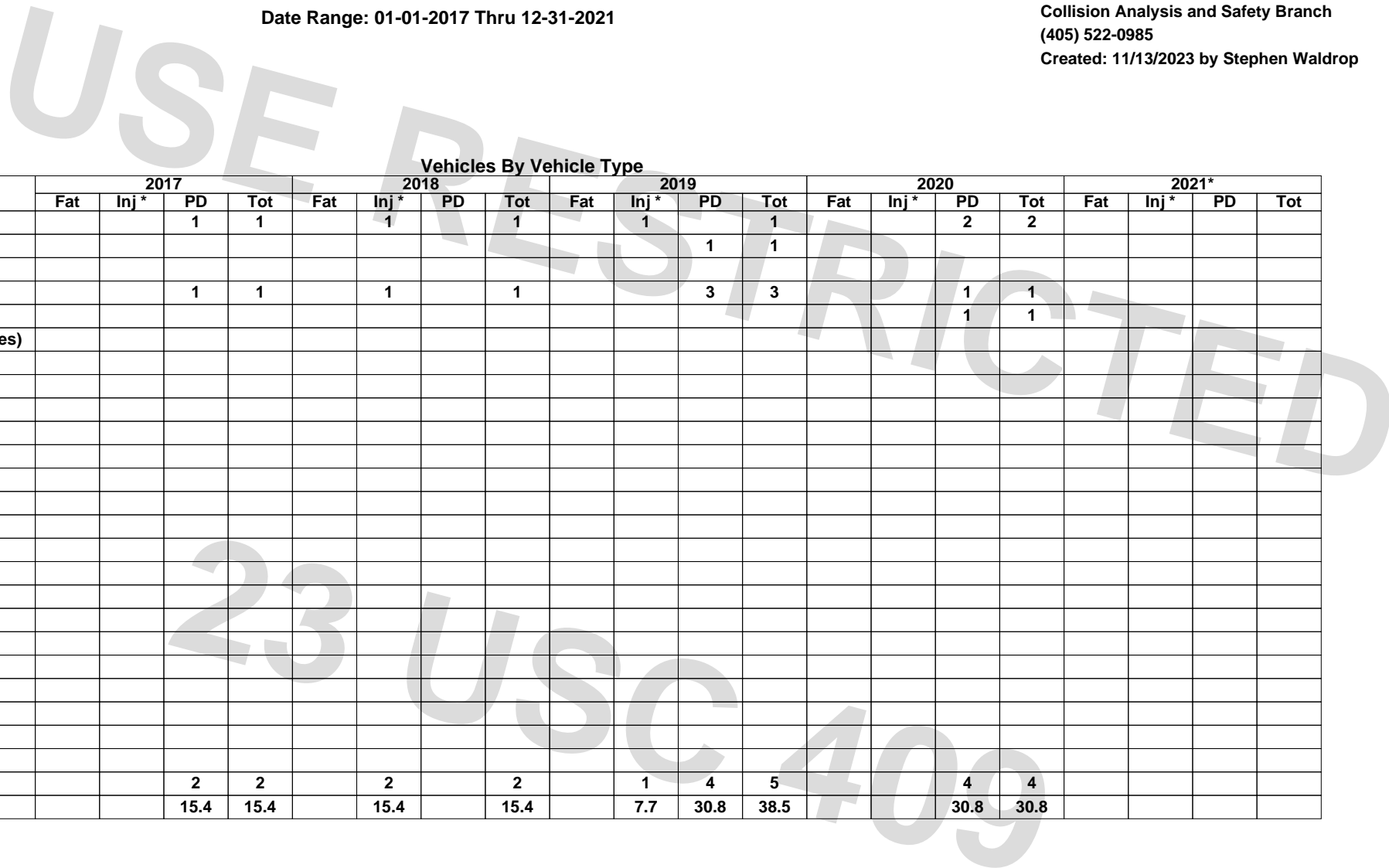
* INCLUDES SUSPECTED SERIOUS, NON-INCAPACITATING, AND POSSIBLE INJURIES.



TABULATION OF COLLISIONS

Date Range: 01-01-2017 Thru 12-31-2021

Program Provided by:
 Traffic Engineering Division
 Collision Analysis and Safety Branch
 (405) 522-0985
 Created: 11/13/2023 by Stephen Waldrop



Vehicles By Vehicle Type

Vehicle Type	2017				2018				2019				2020				2021*			
	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			2	2				
Passenger Vehicle-4 Door											1	1								
Passenger Vehicle-Convertible																				
Pickup Truck			1	1		1		1			3	3		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																				
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)																				
Passenger Van																				
Truck More Than 10,000 lbs.																				
Van (10,000 lbs. or less)																				
Other																				
Total			2	2		2		2		1	4	5		4	4					
Percent			15.4	15.4		15.4		15.4		7.7	30.8	38.5		30.8	30.8					

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



TABULATION OF COLLISIONS

Date Range: 01-01-2017 Thru 12-31-2021

Program Provided by:
 Traffic Engineering Division
 Collision Analysis and Safety Branch
 (405) 522-0985
 Created: 11/13/2023 by Stephen Waldrop

Vehicles By Vehicle Type

Vehicle Type	Total				
	Fat	Inj *	PD	Tot	Pct
Passenger Vehicle-2 Door		2	3	5	38.5
Passenger Vehicle-4 Door			1	1	7.7
Passenger Vehicle-Convertible					
Pickup Truck		1	5	6	46.2
Single-Unit Truck (2 axles)			1	1	7.7
Single-Unit Truck (3 or more axles)					
School Bus					
Truck/Trailer					
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)					
Passenger Van					
Truck More Than 10,000 lbs.					
Van (10,000 lbs. or less)					
Other					
Total		3	10	13	100
Percent		23.1	76.9	100	

USE RESTRICTED

23 USC 409

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



TABULATION OF COLLISIONS

Date Range: 01-01-2017 Thru 12-31-2021

Program Provided by:
 Traffic Engineering Division
 Collision Analysis and Safety Branch
 (405) 522-0985
 Created: 11/13/2023 by Stephen Waldrop

Day And Time Of Occurrence Of Collisions

Day	Hour Of The Day																								Tot	Pcnt		
	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				
Sunday																												
Monday																												
Tuesday																												
Wednesday								1																		1	14.3	
Thursday																1	1		1							3	42.9	
Friday								1									1				1					3	42.9	
Saturday																												
	Early Morning - Sunrise						Morning Peak			Mid Morning/Afternoon						PM Peak			Evening - Late Night						Tot	Pcnt		
Total							2									3			2						7	100		
Percent							28.6									42.9			28.6						100			

Roadway/Lighting

Roadway Conditions	Lighting Conditions					Total	Percent
	Daylight	Darkness	Twilight	Lighted	Unknown		
Dry	4		1			5	71.4
Wet (Water)	2					2	28.6
Ice, Snow, or Slush							
Mud, Dirt, Gravel, or Sand							
Other							
Total	6		1			7	100
Percent	85.7		14.3			100	

Weather Conditions

Weather Conditions	Total	Percent
Clear	5	71.4
Clouds Present		
Raining/Fog	1	14.3
Snowing/Sleet/Hail	1	14.3
Other		
Total	7	100



TABULATION OF COLLISIONS

Date Range: 01-01-2017 Thru 12-31-2021

Program Provided by:
 Traffic Engineering Division
 Collision Analysis and Safety Branch
 (405) 522-0985
 Created: 11/13/2023 by Stephen Waldrop

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	Total	Pcnt				
Failed to Yield		1	2															1	1	3	4	30.8		
Failed to Stop																								
Failed to Signal																								
Improper Turn																								
Improper Start																								
Improper Stop																								
Improper Backing																								
Improper Parking																								
Improper Passing																								
Improper Lane Change																								
Left of Center																								
Following Too Close			1																	1	1	7.7		
Unsafe Speed		1																		1	1	7.7		
DWI																								
Inattention			1																		1	1	7.7	
Negligent Driving																								
Defective Vehicle																								
Wrong Way																								
No Improper Action		1	4																	1	1	5	6	46.2
Other																								
Total		3	8																	2	3	10	13	100
Percent		23.1	61.5																	15.4	23.1	76.9	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.



HIGHWAY SYSTEM COLLISION LISTING

Date Range: 01-01-2017 Thru 12-31-2021

Program Provided by:
 Traffic Engineering Division
 Collision Analysis and Safety Branch
 (405) 522-0985
 Created: 11/13/2023 by Stephen Waldrop

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
(35) JOHNSTON (30) TISHOMINGO HWY: SH-22, MAIN ST. AT: SH-99																			
35	30	16	07	03.27	SH-99		YES	Y			2	3		ANGLE-TURNING	F-YIELD	DYLGT	DRY	N-I INJ	10-05-2018
(35) JOHNSTON (30) TISHOMINGO HWY: SH-22, MAIN ST. AT: SH-22, SH-22 -STUB																			
35	30	16	18	02.97	SH-22 -STUB		YES	Y	E	E	2			REAR-END	INATT	DYLGT	WET	PDO	01-02-2019
35	30	16	18	02.97	SH-22 -STUB		YES	Y	W	-	1	1		F-O CULVERT	UNSAF-SPD	DYLGT	WET	P INJ	06-06-2019
35	30	16	18	02.97	SH-22 -STUB		YES	Y			2			REAR-END	FOL-CLOSE	DYLGT	DRY	PDO	01-03-2020
(35) JOHNSTON (30) TISHOMINGO HWY: , SH-22 -STUB AT: SH-99																			
35	30	38	19	00.22	SH-99		YES	Y	N	S	2			RIGHT-ANGLE	F-YIELD	DYLGT	DRY	PDO	04-23-2020
(35) JOHNSTON (30) TISHOMINGO HWY: SH-22, MAIN ST. AT: WESTERN AVE.																			
35	30	16		03.17	WESTERN AVE.		YES	Y	S	E	2			ANGLE-TURNING	F-YIELD	DUSK	DRY	PDO	04-26-2019
(35) JOHNSTON (30) TISHOMINGO HWY: SH-99 AT: RAY BRANUM/12 ST.																			
35	30	24		05.10	RAY BRANUM/12 ST.		YES	Y			2			RIGHT-ANGLE	F-YIELD	DYLGT	DRY	PDO	05-25-2017

23 USC 409

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



STUDY CRITERIA

Date Range: 01-01-2017 Thru 12-31-2021

Program Provided by:
 Traffic Engineering Division
 Collision Analysis and Safety Branch
 (405) 522-0985
 Created: 11/13/2023 by Stephen Waldrop

ROADWAY / REGION

QUERY OVER		SELECTIONS
1	Control Section	County: 35, Control Section: 38, CS Type: hwy, CS Query On: range, Mile Start: 00.00, Mile End: 00.22
2	Control Section	County: 35, Control Section: 24, CS Type: hwy, CS Query On: range, Mile Start: 04.91, Mile End: 05.20
3	Control Section	County: 35, Control Section: 16, CS Type: hwy, CS Query On: range, Mile Start: 02.86, Mile End: 03.35

DATE

Date Range	01-01-2017 to 12-31-2021
------------	--------------------------

FILTER COLLISIONS

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

REPORT SECTIONS

Collision Map & Study Totals	(Included)
Collision Analysis Tables	(Included)
- Totals By City, Hwy Class	Checked
- Other Analysis Tables	Checked
Collision Listing	(Included)
- Highway Collision Listing	Checked, By Control Section
- City Street Collision Listing	Checked
- County Road Collision Listing	Checked
Query Criteria	(Included)

REPORT FORMAT OPTIONS

Print Watermark	Checked
Print DPS Case Numbers	Unchecked

**APPENDIX I
HISTORICAL TRAFFIC DATA PROVIDED BY ODOT**



ANNUAL GROWTH RATE

AVERGE = 1.70%

MIN. AGR = 1%

MAX. AGR = 2.82%