

# TRAFFIC IMPACT STUDY – MID-AMERICA INDUSTRIAL PARK (MAIP) MIXED USE DEVELOPMENT



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Oklahoma Ordinance Works Authority

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# 1 INTRODUCTION AND OBJECTIVE

This report documents the results of a Traffic Impact Study (TIS) conducted for a proposed mixed-use development located in Pryor Creek, OK. The proposed development is located north of State Highway 69A (SH-69A) along SE 69th Street (EW-530 Rd.) between Oakwood Drive and S. Elliott Street (NS-432 Rd.). A map showing the general location of the proposed development is illustrated in **Figure 1**.

This traffic study was conducted to identify expected trips that would be generated by the MAIP mixed-use development, how the trips flow through the study network, and to determine the effects of site traffic on the surrounding roadway network. There are four separate traffic conditions analyzed as part of this report:

- 2019 Base Conditions
- 2030 Base Conditions
- 2030 Base plus Site Traffic on Existing Network Conditions
- 2030 Base plus Site Traffic on Proposed Network Conditions

Specific recommendations are included at the end of this report to help mitigate traffic impacts and to provide recommendations for the streets connecting SE 69th Street to SH-69A.

## 2 DATA COLLECTION

The data collection effort included obtaining peak hour turning movement counts and documentation of current roadway geometrics and traffic control.

### 2.1 Peak Hour Turning Movement Counts

Olsson coordinated collection of peak hour turning movement counts for five study intersections on Thursday, March 7th, 2019.

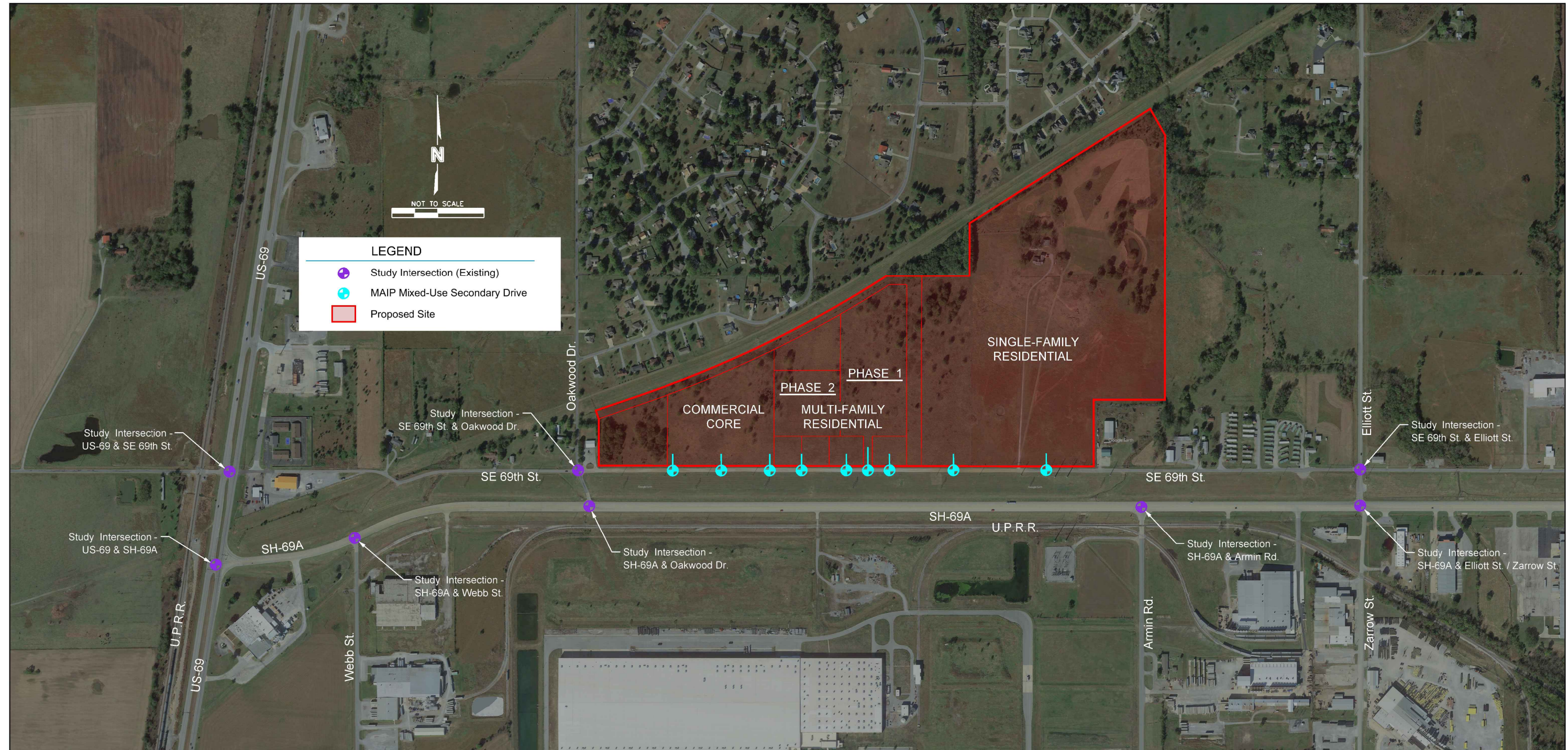
Counts were taken at 15-minute intervals from 7:00 am to 9:00 am and from 4:00 pm to 6:00 pm, with the exception of a full 12-hour count (from 7:00 am to 7:00 pm) taken at SH-69A and Zarrow Street / Elliott Street. The 12-hour count was taken at SH-69A and Zarrow Street / Elliott Street in order to evaluate traffic signal warrants at this intersection.

The raw peak hour traffic volumes collected were modified slightly to account for seasonal variations in traffic demand. The adjusted counts are defined as the 2019 base peak hour traffic volumes and are illustrated in **Figure 2**. Count data are provided in **Appendix A**.



# Figure 1: Study Area Map

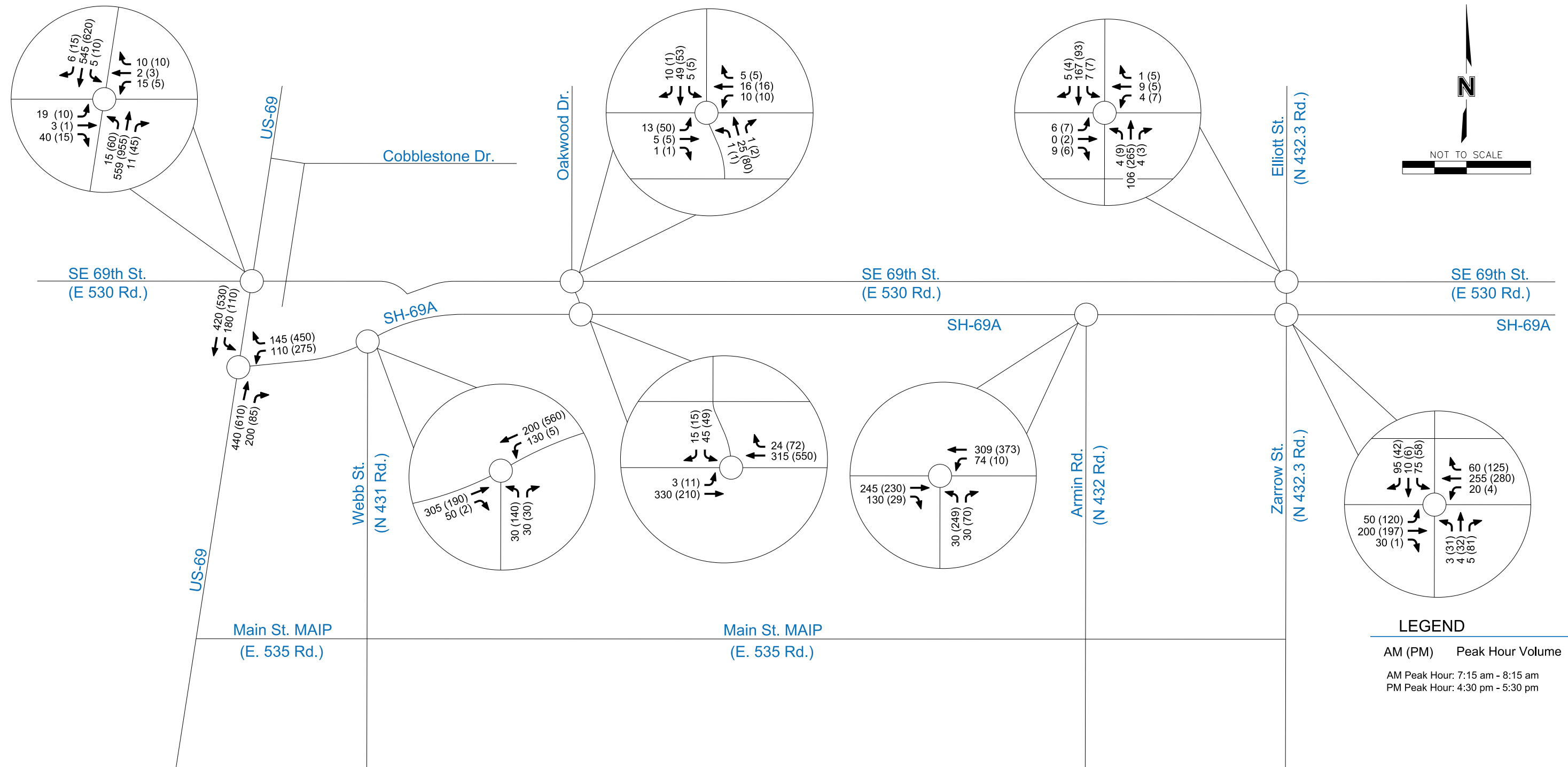
Mixed Use Development North of US-69A - Mid-America Industrial Park  
Pryor Creek, OK





# Figure 2: 2019 Base Peak Hour Traffic Volumes

Mixed Use Development North of US-69A - Mid-America Industrial Park  
Pryor Creek, OK



### **3 EXISTING CONDITIONS**

Existing traffic conditions were evaluated to identify any existing deficiencies and to provide a baseline for comparison purposes.

#### **3.1 Network Characteristics**

There are two highways and two other significant roads within the study area: US Highway 69 (US-69), State Highway 69A (SH-69A), SE 69th Street (EW-530 Rd.), and Zarrow Street / Elliott Street (NS-432 Rd.). Other streets within the study area that were considered with this traffic impact study include Armin Road (NS-430 Rd.), Webb St. (NS-431 Rd.), and Oakwood Drive (NS-431 Rd.). Armin Road and Webb St. extend south of SH-69A, while Oakwood Drive extends to the north of SH-69A.

The mixed-use development will be located along SE 69th Street to the north with several access points to SE 69th Street. A somewhat iterative approach was used to determine where access points should be provided from SE 69th Street to SH-69A to serve the development adequately without excessively impacting the existing intersections nearby. Ultimately, no new access points are recommended based on the size of the development, but additional improvements at the existing intersections of Oakwood Drive and Zarrow Street / Elliott Street (NS-432 Rd.) will be necessary.

US-69 is classified by ODOT as a principal arterial. It is a divided, partial access-controlled expressway with two lanes provided for both the northbound and southbound directions. The speed limit is 55 mph through the study area. There are two study intersections located on US-69: SH-69A and SE 69th Street.

SH-69A is classified by ODOT as a major collector. It is an undivided highway that provides four lanes (two both eastbound and westbound) near US-69 and five lanes (two both directions with a two-way left-turn lane) beginning just west of Oakwood Drive and extending east through the study boundary. The speed limit is 55 mph along this corridor with the exception of a speed reduction to 45 mph through the Zarrow Street / Elliott Street intersection. There are five study intersections located along SH-69A: US-69, Webb Street, Oakwood Drive, Armin Road, and Zarrow Street / Elliott Street.

SE 69th Street is classified by ODOT as a local street. It provides one lane for both eastbound and westbound directions and is currently unposted. A 40 mph design speed was assumed for analysis purposes. Parts of SE 69th Street are currently unpaved while others provide an asphalt surface. Three intersections were studied along SE 69th Street: US-69, Oakwood Drive, and Elliott Street. In total, there are eleven driveways serving the new development off of SE 69th Street. Several residences are currently accessed from SE 69th Street just west of Elliott

Street. There is a geometric constriction that likely poses a hazard to unfamiliar drivers that is located near the creek on the west end of the street. SE 69th Street should be able to be closed at this location to avoid cut-through traffic from the proposed mixed-use development being exposed to this hazard and to route site-generated traffic to the SH-69A and US-69 signalized intersection instead of to the unsignalized intersection at SE 69th Street.

Zarrow Street is classified by ODOT as a local road and serves MAIP parcels south of SH-69A. Elliott Street is classified by ODOT as a minor arterial. Elliott Street provides an alternative route into Pryor Creek versus US-69 and is posted with a speed limit of 45 mph. Elliott Street also provides access to several homes and closer to the core of town some large neighborhoods. Zarrow Street does not have a posted speed limit; 40 mph was the assumed design speed. Both Zarrow Street and Elliott Street provide one lane in both the northbound and southbound directions. Although, there is no shoulder provided, there are some on-street parking spaces provided along Zarrow Street.

Armin Road is classified by ODOT as a local road and serves MAIP parcels south of SH-69A. It has one lane for both the northbound and southbound directions. It is currently posted at 40 mph. Armin Road also has an at-grade railroad crossing located approximately 80 feet south of SH-69A which doesn't allow for much queuing between the tracks and the highway. Also, the rail crossing at this location frequently blocks traffic on Armin Road throughout the day due to local freight cargo loading/unloading, making Armin Road impassable at times.

Webb Street is classified by ODOT as a local road and serves MAIP parcels south of SH-69A. It has one lane for both the northbound and southbound directions. It is currently posted at 40 mph.

Oakwood Drive is classified by ODOT as a local road. Oakwood Drive connects to SE 69th Street north of SH-69A and serves large neighborhoods to the north. Oakwood Drive has a posted speed limit of 35 mph and provides one lane in both the northbound and southbound directions.

The intersection of US-69 and SH-69A is a signalized intersection. There are channelized right-turn lanes for the northbound and westbound intersection approaches. All other study intersections are currently unsignalized and are two-way stop control (TWSC) with the exception of Oakwood Drive and SE 69th Street. Oakwood Drive and SE 69th Street is all-way stop control (AWSC).

Existing lane configurations and traffic control are illustrated in **Figure 3**.

**Table 1. Existing Roadway Characteristics**

Roadway	Section	Median Type	Posted Speed	Functional Classification
<b>US-69</b>	4-Lane	Divided	55 mph	Principal Arterial - Expressway
<b>SH-69A</b>	4-Lane/5-Lane	None	55 mph	Major Collector
<b>SE 69th St.</b>	2-Lane	None	40 mph	Local Road
<b>Zarrow St. / Elliott St.</b>	2-Lane	None	40 mph / 45 mph	Local Road / Minor Arterial
<b>Armin Rd.</b>	2-Lane	None	40 mph	Local Road
<b>Webb St.</b>	2-Lane	None	40 mph	Local Road
<b>Oakwood Dr.</b>	2-Lane	None	35 mph	Local Road

### 3.2 2019 Base Conditions Capacity Analysis Summary

Capacity analyses were performed for the existing study intersections utilizing the existing lane configurations and traffic control. Analyses were conducted using *Synchro, Version 10.0* which is based on the *Highway Capacity Manual, 6th Edition* delay methodologies. For simplicity, the amount of control delay is equated to a grade or Level of Service (LOS) based on thresholds of driver acceptance. The amount of delay is assigned a letter grade A through F, LOS A representing little or no delay and LOS F representing very high delay. **Table 2** shows the delays associated with each LOS grade for signalized and unsignalized intersections, respectively. For the signalized intersections, timings and clearances are intended to be consistent with those in the field.

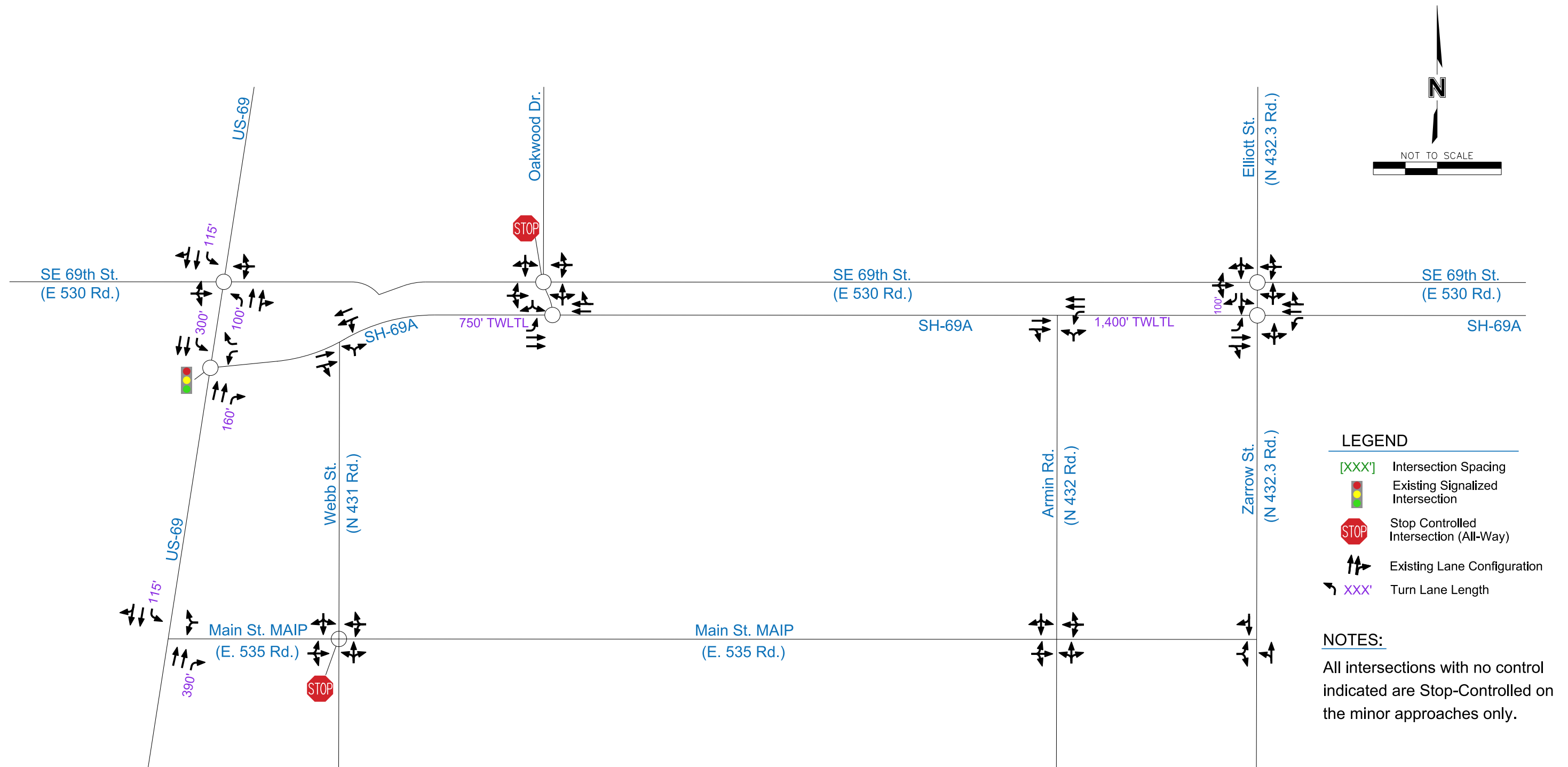
**Table 2. Intersection LOS Criteria**

Level of Service	Average Control Delay (seconds)	
	Signalized	Unsignalized
<b>A</b>	≤ 10	≤ 10
<b>B</b>	> 10-20	> 10-15
<b>C</b>	> 20-35	> 15-25
<b>D</b>	> 35-55	> 25-35
<b>E</b>	> 55-80	> 35-50
<b>F</b>	> 80	> 50

*Highway Capacity Manual (HCM, 6<sup>th</sup> Ed.)*

# Figure 3: Existing Lane Configurations and Traffic Control

Mixed Use Development North of US-69A - Mid-America Industrial Park  
Pryor Creek, OK





Results of the 2019 base year existing conditions analysis indicate lane group LOS of D or worse at the following locations:

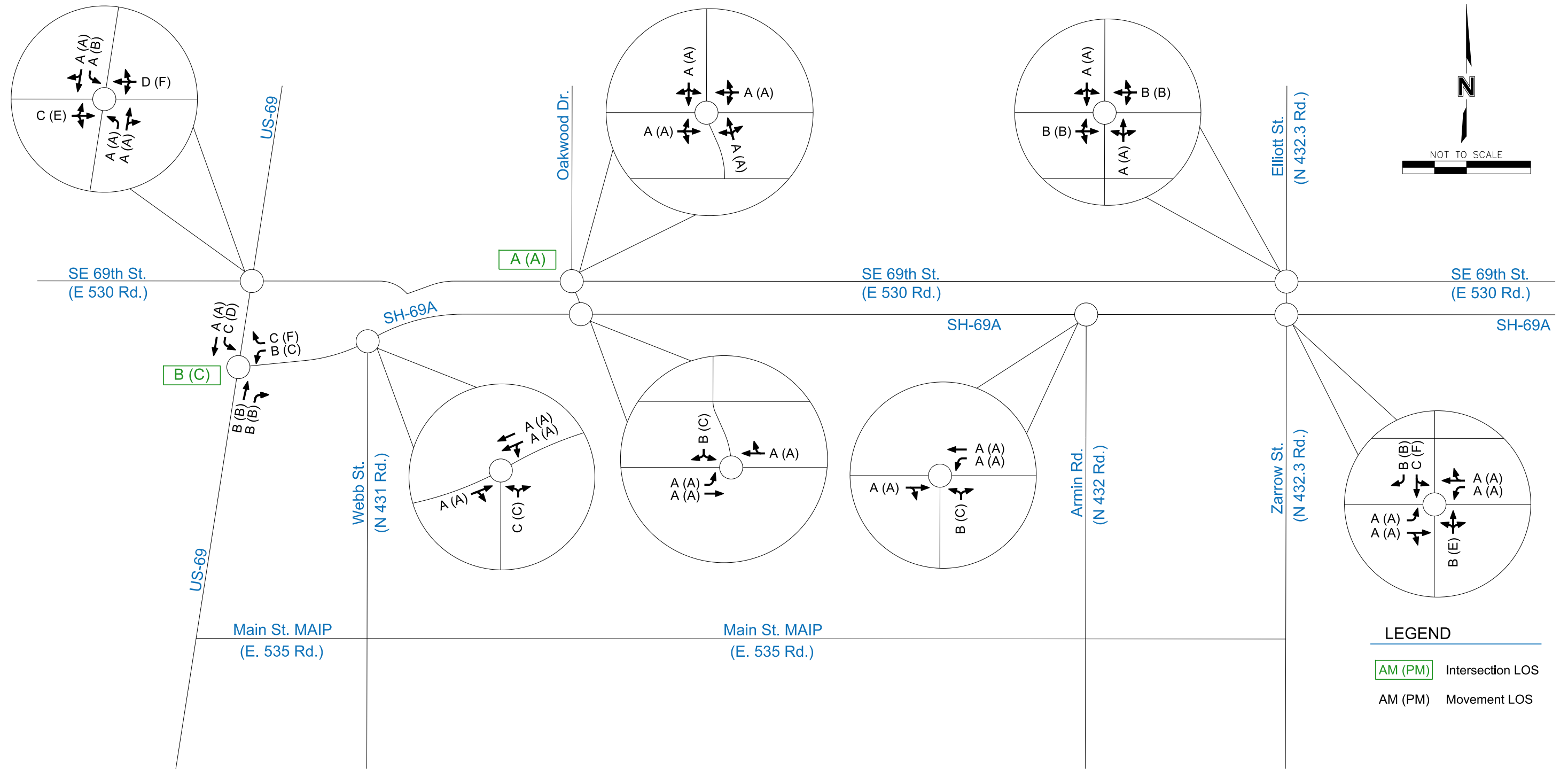
- US-69 & SE 69th St.
  - Eastbound Left/Thru/Right: E (PM Peak)
  - Westbound Left/Thru/Right: D (AM Peak); F (PM Peak)
- US-69 & SH-69A
  - Westbound Right: F (PM Peak)
- SH-69A & Zarrow St.
  - Northbound Left/Thru/Right: E (PM Peak)
  - Southbound Left/Thru: F (PM Peak)

All other lane groups operate at LOS C or better. The signalized intersection of US-69 and SH-69A operates at LOS B in the AM peak hour and at LOS C in the PM peak hour. The all-way stop-controlled (AWSC) intersection of SE 69th St. and Oakwood Dr. operates at LOS A during both peak hour periods.

The 2019 Base Capacity Analysis Summary is illustrated in **Figure 4**. Detailed results can be found in **Appendix B**.

# Figure 4: 2019 Base Capacity Analysis Summary

Mixed Use Development North of US-69A - Mid-America Industrial Park  
Pryor Creek, OK



## 4 FUTURE BASE TRAFFIC VOLUME AND ANALYSIS

To evaluate 2030 conditions, it was necessary to establish peak hour volumes for 2030. Current traffic volumes and projected ADT volumes were used as a basis for peak hour volume projections. Design Year 2030 (Full Build-out Horizon) volumes were applied to the network and capacity analyses were performed.

### 4.1 Future Base Traffic Volumes

US-69 is expected to continue to grow as a critical north-south highway in eastern Oklahoma; SH-69A and the other streets are expected to grow at a similar rate. For this study, a growth rate of 2.0% was used to develop 2030 projected volumes. An annual linear rate of 2.0% equates to a growth factor of 1.22 for the 2030 volumes. The growth factor was applied directly to the peak hour turning movement volumes to develop the 2030 base volumes.

The 2030 base peak hour volumes are shown in **Figure 5**.

### 4.2 2030 Base Conditions Capacity Analysis Summary

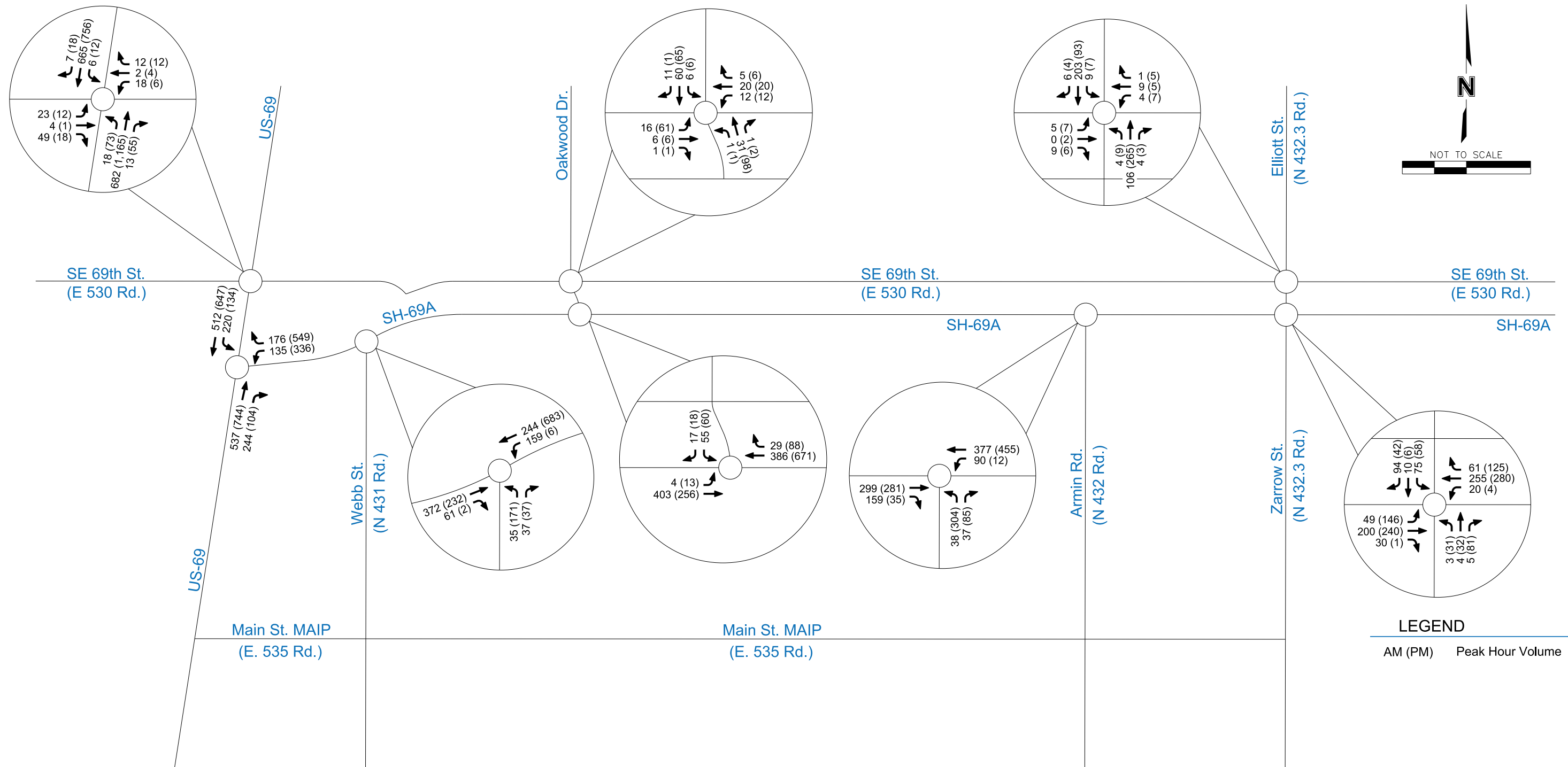
Capacity analysis for 2030 conditions was conducted to analyze expected operations and as a baseline for comparison purposes. No baseline improvements were assumed for the corridor for this scenario.

Results of the analysis indicate lane group LOS D or worse at the following locations:

- US-69 & SE 69th St.
  - Eastbound Left/Thru/Right: E (AM Peak); F (PM Peak)
  - Westbound Left/Thru/Right: F (AM Peak); F (PM Peak)
- US-69 & SH-69A
  - **Intersection LOS: D (PM Peak)**
  - Westbound Right: F (PM Peak)
  - Southbound Left: D (PM Peak)
- SH-69A & Webb St.
  - Northbound Left/Right: D (PM Peak)
- SH-69A & Armin Rd.
  - Northbound Left/Right: D (PM Peak)
- SH-69A & Zarrow St.
  - Northbound Left/Thru/Right: F (PM Peak)
  - Southbound Left/Thru: E (AM Peak); F (PM Peak)

# Figure 5: 2030 Base Peak Hour Traffic Volumes

Mixed Use Development North of US-69A - Mid-America Industrial Park  
Pryor Creek, OK

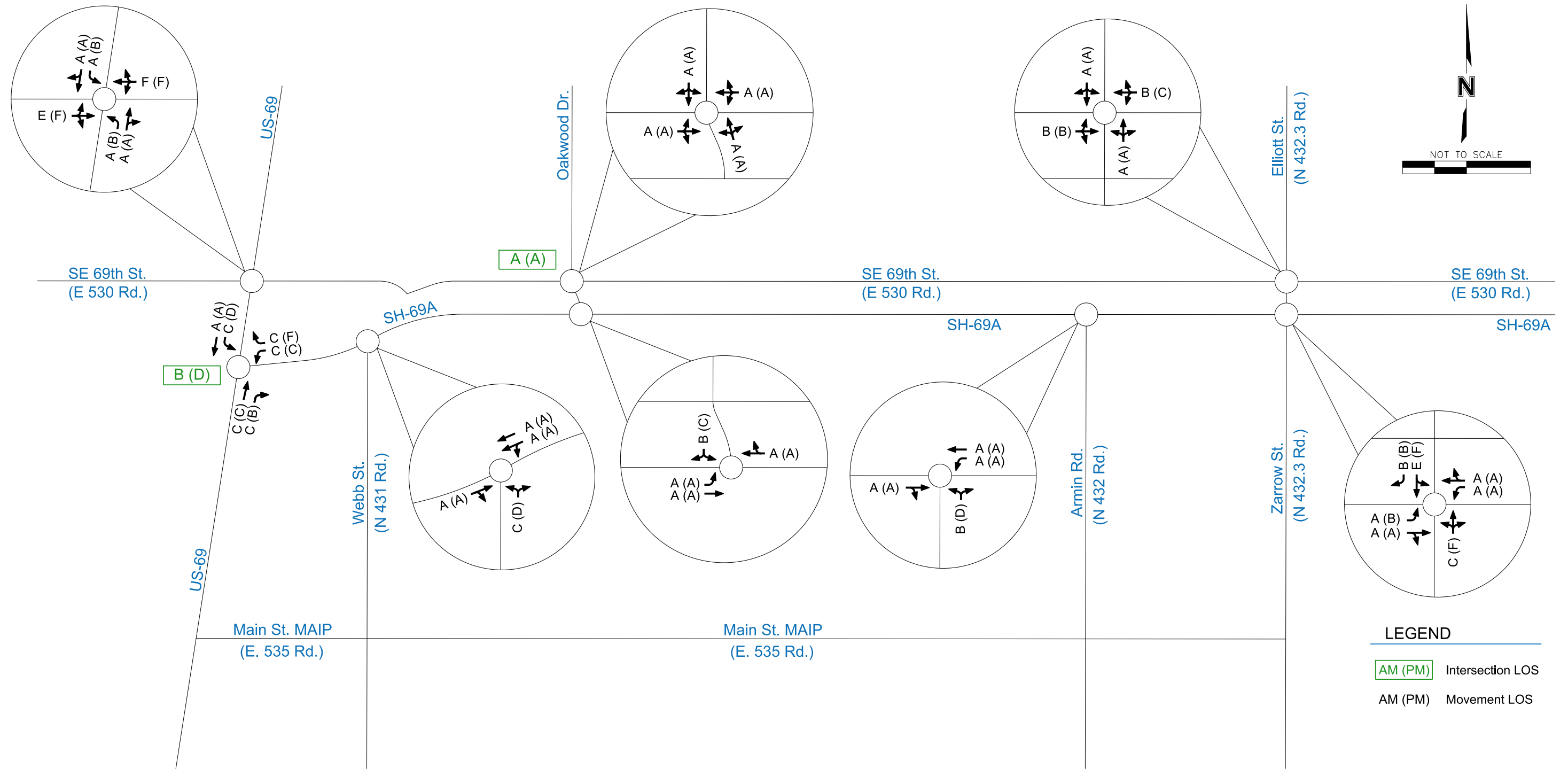


All other lane groups operate at LOS C or better. The overall signalized intersection of US-69 and SH-69A operates at LOS B in the AM peak hour and at LOS D in the PM peak hour. The all-way stop-controlled (AWSC) intersection of SE 69th St. and Oakwood Dr. operates at LOS A during both peak hour periods.

The 2030 Base Capacity Analysis Summary is illustrated in **Figure 6**. Detailed results may be found in **Appendix B**.

# Figure 6: 2030 Base Conditions Capacity Analysis Summary

Mixed Use Development North of US-69A - Mid-America Industrial Park  
Pryor Creek, OK





## 5 SITE CHARACTERISTICS

To determine street network operations and development impacts, trips associated with the mixed-use development were generated and applied to the study network. This study assumes no new drives connecting SE 69th Street along the development frontage to SH-69A. Instead, existing connections at Oakwood Drive and at Elliott Street will be improved as needed.

### SH-69A at Elliott Street and Oakwood Drive

After a review of the field conditions and consideration of the nearby vehicle speeds and the percentage of heavy trucks in the vicinity of the site, the following recommendations are provided regarding the two intersections:

- Provide exclusive eastbound left-turn lane striping with adequate turn lane lengths to allow for full deceleration for a 50 mph design speed (in accordance with *Green Book* Table 9-22). It is recommended that the minimum length turn lanes consist of 300 linear feet of full 14-foot width turn lane with a 125-foot taper.
- Provide separate southbound left-turn and right-turn lanes at both intersections with SH-69A.
- Maintain stop control (TWSC) operations for the Elliott Street and Oakwood Drive intersections unless intersection control upgrades are necessary based on traffic volumes and/or operations.

### SE 69th Street at Elliott Street and Oakwood Drive

The following recommendations are provided regarding the SE 69th Street intersections with Elliott Street and Oakwood Drive respectively:

- A three-lane section (with two-way left-turn lane) should be provided for SE 69th Street. Convert to an exclusive left-turn lane at the two intersections.
- Given the limited amount of storage length available between SE 69th Street and SH-69A (the northbound approaches) and the generated traffic anticipated, the stop signs should be placed on the two SE 69th Street approaches for both primary access drive intersections. Both intersections will be TWSC intersections.

The site plan used for this study is provided in **Figure 7**.

### 5.1 Trip Generation

To determine the impact of potential site traffic on the roadway network, trips expected to be associated with the proposed site were generated and applied to the study network. The

Institute of Transportation Engineers (ITE) provides methods for estimated traffic volumes of common land uses in the *ITE Trip Generation Manual (10<sup>th</sup> Edition)*. The land uses that most resemble the MAIP Mixed-Use Development site are listed as follows by Land Use Codes (LUC):

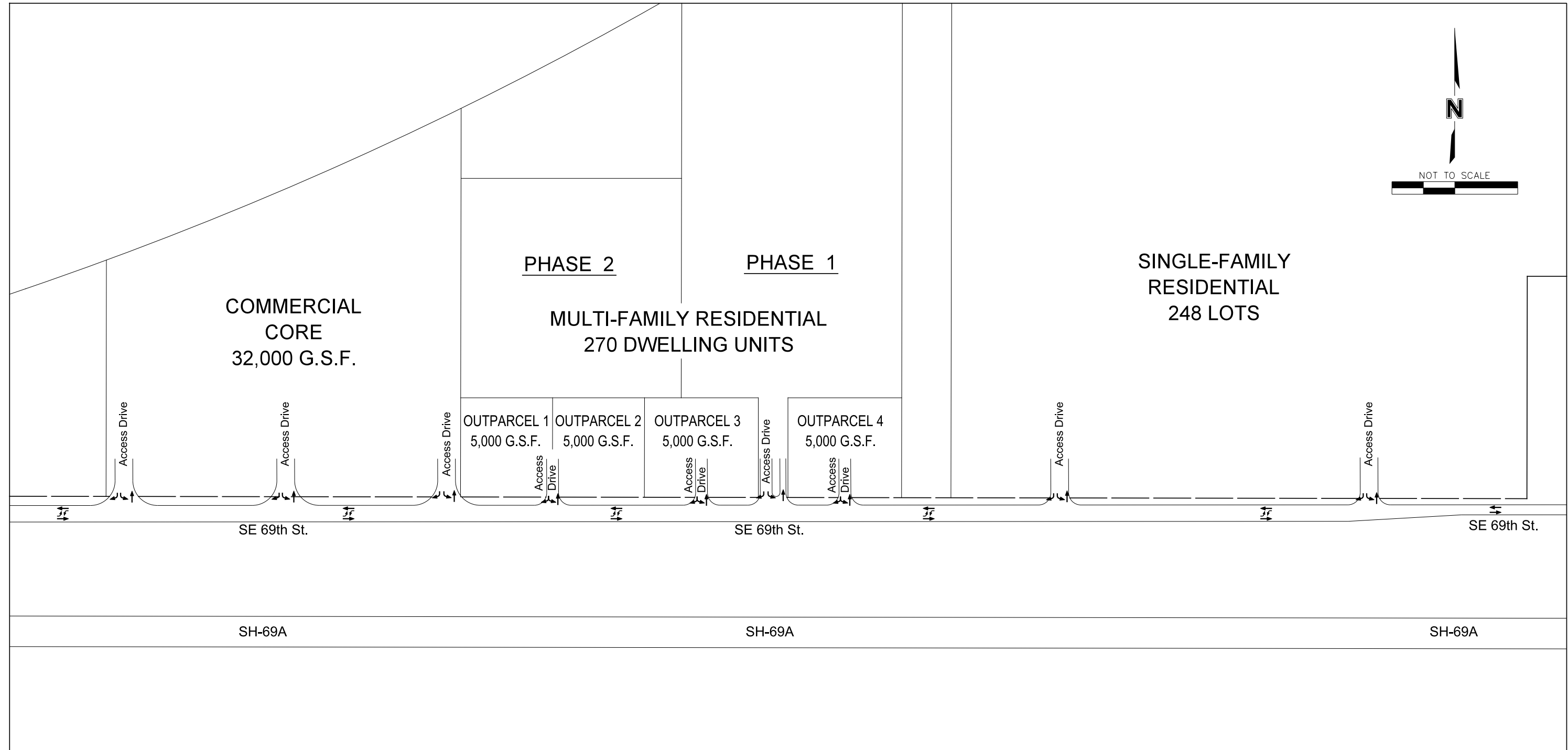
- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• LUC 820, Shopping Center</li> <li>• LUC 210, Single-Family Detached Housing</li> <li>• LUC 220, Multi-Family Housing (Low-Rise)</li> </ul> | <p>Commercial Core;<br/>Commercial Outparcels 1 thru 4<br/>Single-Family Residential<br/>Multi-Family Residential -<br/>Phases 1 &amp; 2</p> |
|---|--|

The proposed site is expected to generate 6,281 daily, 357 AM peak hour, and 796 PM peak hour trips. A summary of the expected number of daily, AM peak hour, and PM peak hour site trips are shown in **Table 3**.

Based on ITE methodologies, a pass-by/diverted-link trip reduction was applied to the site trips to account for trips made to the site while on the way to another destination. Pass-by trips include trips that are diverted from the roadways adjacent to the development that have direct access. Diverted-link trips include trips that are diverted from primary highways near the development that have indirect access to the site itself. Primary trips are those made for the specific purpose of visiting the development. The methodology allows for a pass-by/diverted-link trip reduction of 34% in the PM peak hour for LUC 820. This reduction was applied to the total PM peak hour site trips that were commercial in origin.

# Figure 7: Preliminary Site Plan

Mixed Use Development North of US-69A - Mid-America Industrial Park  
Pryor Creek, OK



**Table 3**  
**ITE TRIP GENERATION**  
**MAIP Mixed-Use Development North of SE 69th St.**  
**TRAFFIC IMPACT STUDY**  
**PRYOR CREEK, OK**

**Daily Trip Generation**

ITE Code	Land Use	Size		Daily Trip Generation				Total Daily Trips	
				Trip Gen. Avg. Rate/Eq.	Daily Trips	Trip Distribution		Enter	Exit
820	Shopping Center	32,000	SF	37.75	1,208	50%	50%	604	604
820	Shopping Center	20,000	SF	37.75	755	50%	50%	377	378
210	Single-Family Detached Housing	248	DU	9.44	2,341	50%	50%	1,170	1,171
220	Multi-Family Housing (Low-Rise)	270	DU	7.32	1,976	50%	50%	988	988
<b>Total</b>					<b>6,281</b>			<b>3,139</b>	<b>3,141</b>

**AM Peak Hour Trips**

ITE Code	Land Use	Size		Trip Gen.		AM Peak		Trip Distribution		Total AM Trips		Pass-by Reduction	Pass-by Trips		Primary Trips	
				Avg. Rate/Eq.		Trips		Enter	Exit	Enter	Exit		Enter	Exit		
820	Shopping Center	32,000	SF	0.94		30		62%	38%	19	11	0%	0	0	19	11
820	Shopping Center	20,000	SF	0.94		19		62%	38%	12	7	0%	0	0	12	7
210	Single-Family Detached Housing	248	DU	0.74		184		25%	75%	46	138	0%	0	0	46	138
220	Multi-Family Housing (Low-Rise)	270	DU	0.46		124		23%	77%	28	96	0%	0	0	28	96
<b>Total</b>						<b>357</b>				<b>105</b>	<b>252</b>		<b>0</b>	<b>0</b>	<b>105</b>	<b>252</b>

**PM Peak Hour Trips**

ITE Code	Land Use	Size		Trip Gen.		PM Peak		Trip Distribution		Total PM Trips		Pass-by Reduction	Pass-by Trips		Primary Trips	
				Avg. Rate/Eq.		Peak Trips		Enter	Exit	Enter	Exit		Enter	Exit		
820	Shopping Center	32,000	SF	$\ln(T) = 0.74 \ln(X) + 2.89$		234		48%	52%	114	120	34%	40	40	74	80
820	Shopping Center	20,000	SF	$\ln(T) = 0.74 \ln(X) + 2.90$		165		48%	52%	80	85	34%	28	28	52	57
210	Single-Family Detached Housing	248	DU	0.99		246		63%	37%	155	91	0%	0	0	155	91
220	Multi-Family Housing (Low-Rise)	270	DU	0.56		151		63%	37%	95	56	0%	0	0	95	56
<b>Total</b>						<b>796</b>				<b>444</b>	<b>352</b>		<b>68</b>	<b>68</b>	<b>376</b>	<b>284</b>

## 5.2 Trip Distribution

The trip distribution was developed based on existing and future traffic volumes, trip patterns, and land use characteristics. It is expected that site trips will originate locally and from the larger region. The City of Pryor Creek's core area is located north of the site approximately three miles and is expected to be the origin-destination area for much of the site traffic. The Town of Chouteau and the greater MAIP area also represent significant origin-destination areas.

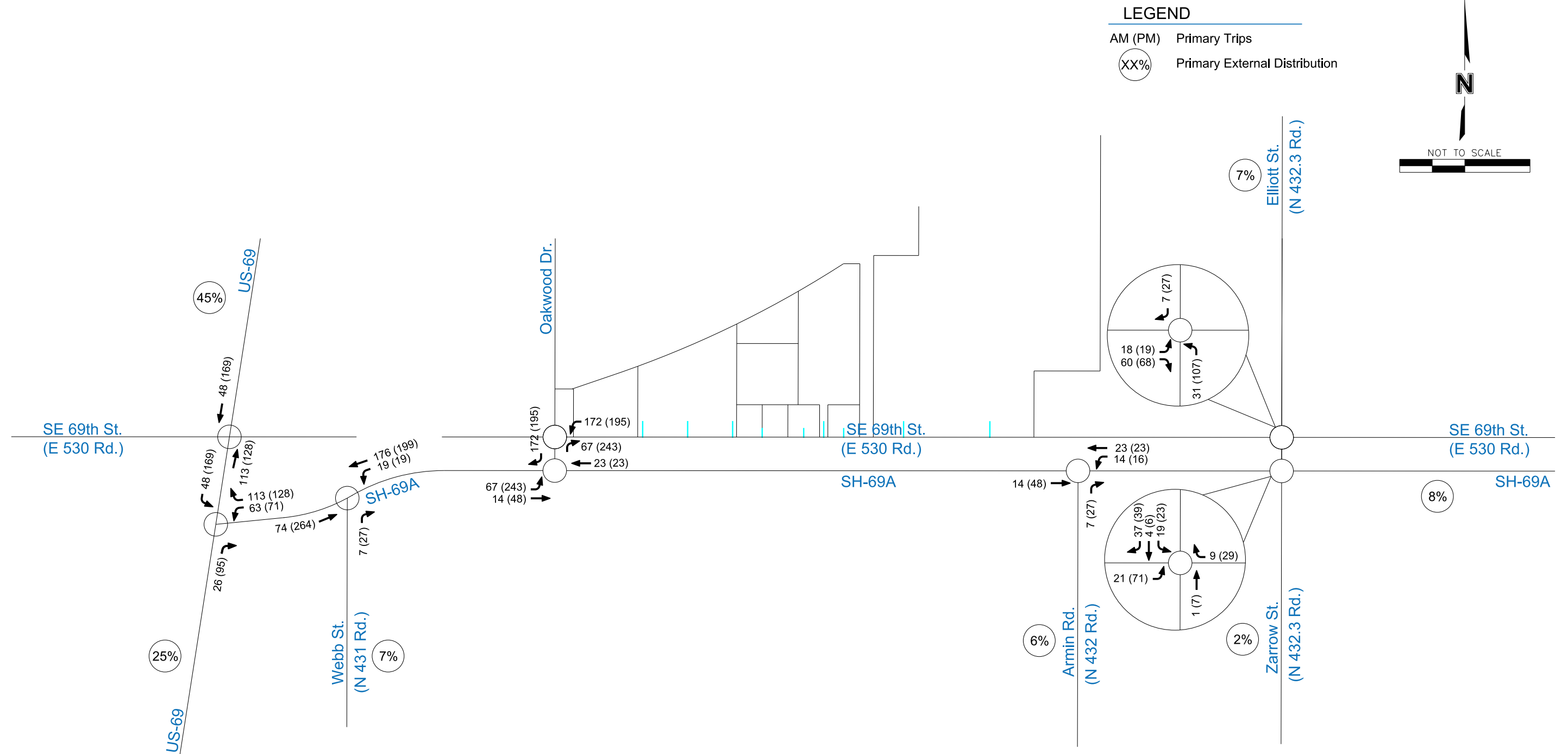
Ultimately, primary site trips were distributed outside of the study boundary as follows:

- 45% to/from the north on US-69
- 25% to/from the south on US-69
- 7% to/from the south on Webb St.
- 6% to/from the south on Armin. Rd.
- 2% to/from the south on Zarrow St.
- 8% to/from the east on SH-69A
- 7% to/from the north on Elliott St.

The trip distribution is illustrated in **Figure 8**. The full build-out site-generated trips for the overall site are illustrated in **Figure 8**. A detailed view of the site-generated trips along SE 69th Street is provided in **Figure 9**. The pass-by and diverted link trips are shown in **Figure 10**.

# Figure 8: Primary Site Trips - Overall

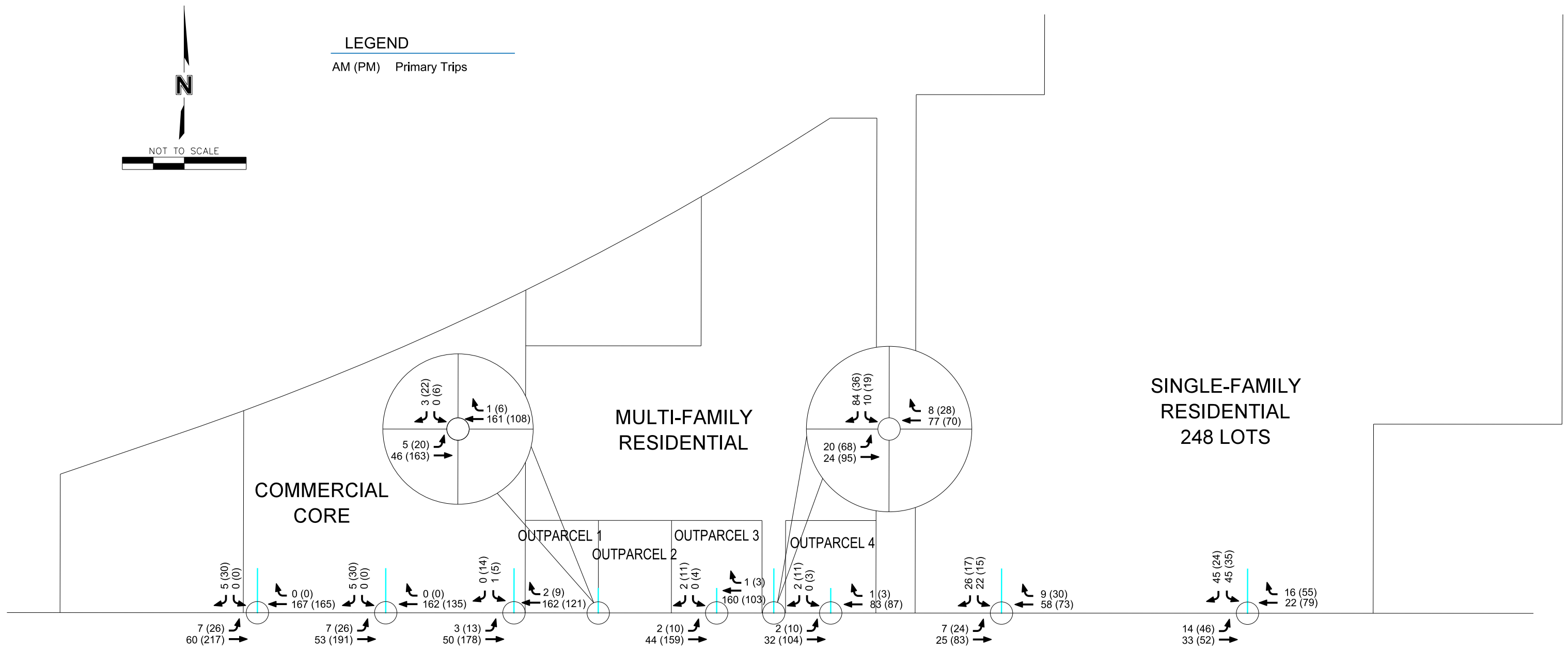
Mixed Use Development North of US-69A - Mid-America Industrial Park  
Pryor Creek, OK





# Figure 9: Primary Site Trips - Along 69th St. Adjacent to Development

Mixed Use Development North of US-69A - Mid-America Industrial Park  
Pryor Creek, OK





## 6 2030 BASE PLUS SITE ANALYSIS

The 2030 base traffic volumes were combined with the proposed site trips to develop the 2030 base plus site volumes for capacity analysis purposes.

The 2030 base plus site peak hour volumes for the overall study area are shown in **Figure 11**. The 2030 base plus site peak hour volumes for the SE 63rd Street corridor are shown in **Figure 12**.

### 6.1 Signal Warrant Evaluation

A traffic signal may be justified if traffic conditions meet any of the applicable nine signal warrants described in the 2009 *Manual on Uniform Traffic Control Devices (MUTCD)*. The *MUTCD* provides criteria for conducting an engineering study to determine whether a traffic signal is appropriate at a given intersection.

#### Warrant 1: Eight-Hour Vehicular Volume

The Minimum Vehicular Volume, Condition A, is intended for application where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The Interruption of Continuous Traffic, Condition B, is intended for application where the traffic volume on a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. If neither Condition A nor B is met, Warrant 1 also allows for re-evaluation of the warrant using 80% of the traffic volumes when the posted speed limit or 85th-percentile speed on the major street exceeds 40 mph, or if the intersection lies within the build-up area of an isolated community having a population of less than 10,000. To meet Warrant 1 requires that at a minimum, one of either condition A, B, or A and B must be met.

#### Warrant 2: Four-Hour Vehicular Volume

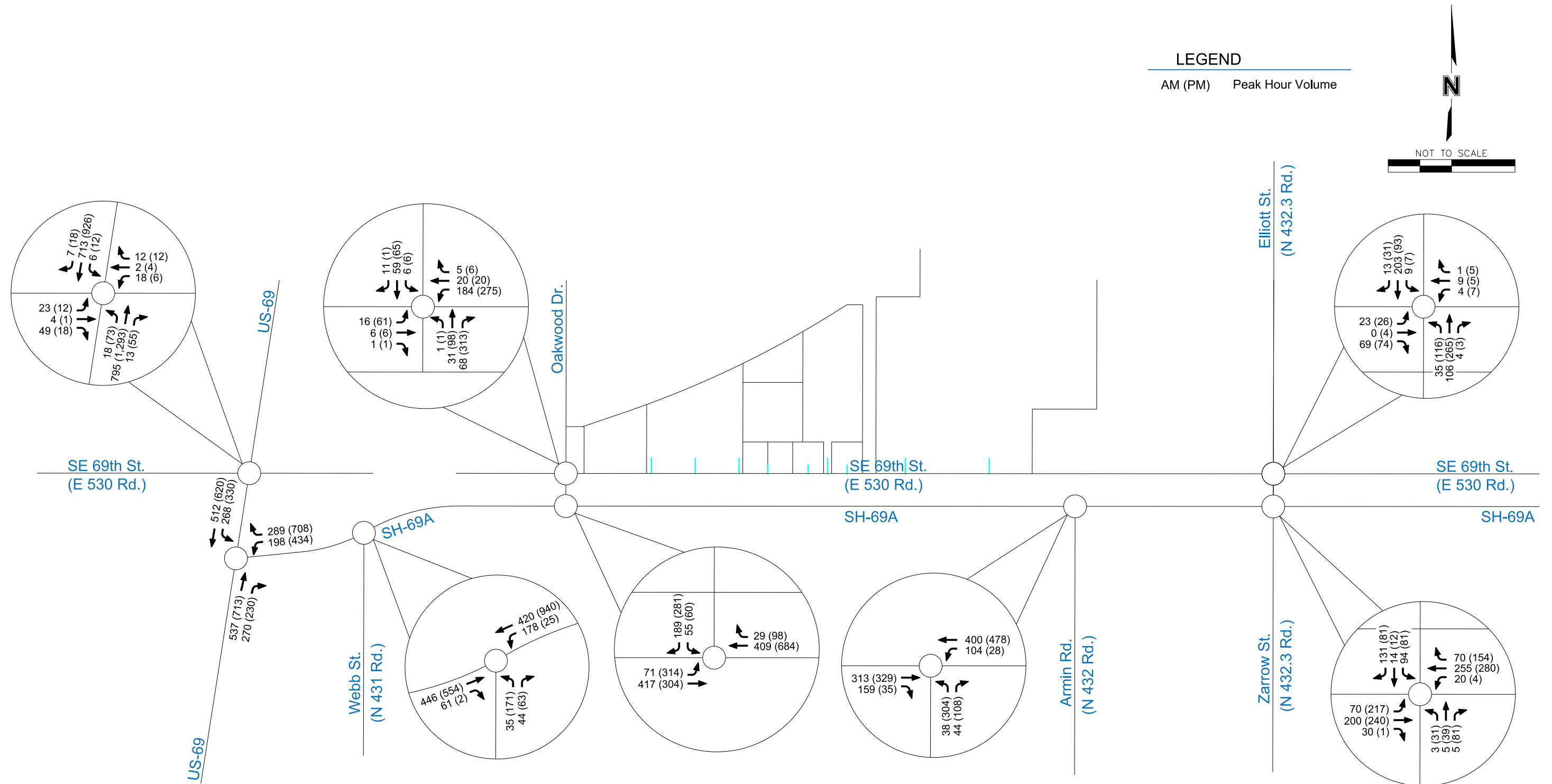
The Four-Hour Vehicular Volume signal warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

#### Warrant 3: Peak Hour Volume

The Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street.

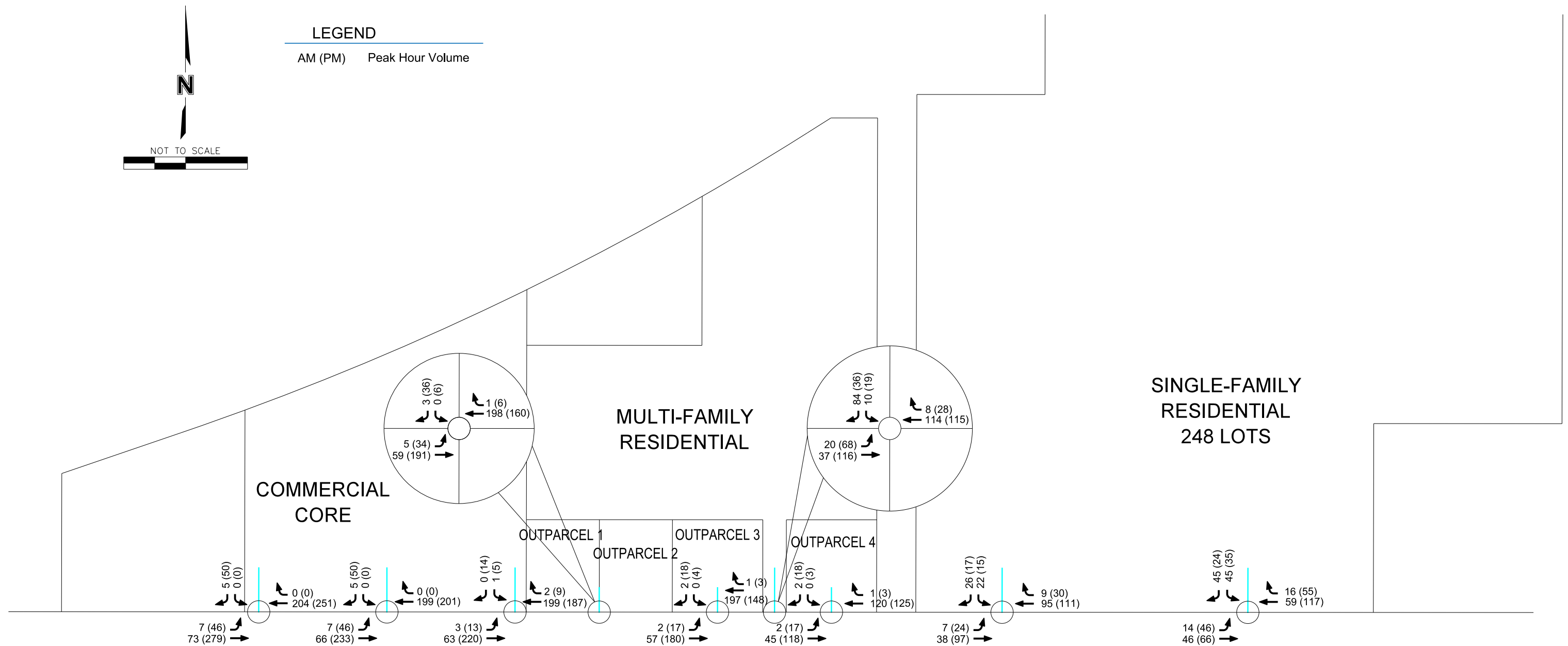
Figure 11:  
2030 Base plus Site Traffic Volumes - Overall

Mixed Use Development North of US-69A - Mid-America Industrial Park  
Pryor Creek, OK



# Figure 12: 2030 Base plus Site Traffic Volumes - Along 69th St. Adjacent to Development

Mixed Use Development North of US-69A - Mid-America Industrial Park  
Pryor Creek, OK



For the purposes of this traffic impact study, Warrants 1, 2, and 3 were reviewed under 2019 base conditions to determine if traffic signal control is warranted for the intersection of SH-69A and Zarrow Street and SH-69A and Oakwood Drive. Signal warrants were evaluated with no reductions to the right-turn volumes.

Based on current data collected for SH-69A at Zarrow Street excluding the exiting right turn volume, Eight-Hour Vehicular Volume Warrant (Warrant 1) and the Four-Hour Vehicular Volume Warrant (Warrant 2) volumes do not meet the necessary criteria that would warrant a traffic signal at the intersection. The Peak Hour Vehicular Volume Warrant (Warrant 3) is also not met for either the AM peak or PM peak hours.

It is worth noting that with the traffic volumes projected for full build-out, the minor road LOS for both intersections will operate at an unacceptable LOS, and delays will be long enough that drivers may begin to risk turning maneuvers with less than typically acceptable gaps in SH-69A traffic. The average delay per vehicle for Oakwood Drive with TWSC operations is 14.0 seconds and 44.8 seconds for the AM and PM peak hours respectively. These delays correspond to 1.5 vehicle-hours and 6.6 vehicle-hours of delay for the Oakwood Drive approach during the respective peak hour periods.

The average delay per vehicle for northbound Zarrow Street with TWSC operations is 21.0 seconds and 230.4 seconds for the AM and PM peak hours respectively. These delays correspond to 0.1 vehicle-hours and 12.4 vehicle-hours of total delay for northbound Zarrow Street alone during the respective peak hour periods. The AM peak hour delay is not significant, but the PM peak hour delay is projected to be significant enough to justify a traffic signal at this intersection as site development occurs.

The average delay per vehicle for southbound Elliott Street with TWSC operations is 41.7 seconds and 44.0 seconds for the AM and PM peak hours respectively. These delays correspond to 4.1 vehicle-hours and 3.3 vehicle-hours of total delay for southbound Elliott Street alone during the respective peak hour periods. The total minor road delay for the Zarrow Street / Elliott Street intersection adds up to 4.2 vehicle-hours and 15.7 vehicle-hours during the respective peak hour periods – both of which represent significant delays.

For full build-out turning movement volumes, both intersections meet Warrants 1, 2, and 3. This does not mean that a traffic signal is currently justified because full build-out is required to generate the volumes necessary to meet the warrant. Instead, traffic volumes and delay at the intersection should be monitored going forward, and a traffic signal should be installed when signal warrants are met based on actual volumes.

The signal warrant evaluations are provided in **Appendix C**.



## 6.2 2030 Base plus Site Traffic on Existing Network Capacity Analysis

Capacity analysis for 2030 base plus site-generated traffic on the existing network was conducted to analyze expected operations to compare with the 2030 base plus site-generated traffic on the improved network. Improvements that were incorporated into the improved conditions scenario include turn lane improvements at US-69 and SH-69A, signalization and geometric improvements at Zarrow Street / Elliott Street and SH-69A, signalization and geometric improvements at Oakwood Drive and SH-69A, improvements at Oakwood Drive and 69th Street, and improvements at Elliott Street at 69th Street as described previously in this study.

Results of the analysis for base plus site-generated traffic on the existing roadway network indicate lane group LOS D or worse at the following locations:

- US-69 & SE 69th St.
  - Eastbound Left/Thru/Right: D (AM Peak); F (PM Peak)
  - Westbound Left/Thru/Right: D (AM Peak); F (PM Peak)
- US-69 & SH-69A
  - Southbound Left: D (AM Peak); F (PM Peak)
  - Westbound Left: D (PM Peak)
  - Westbound Right: F (PM Peak)
- SH-69A & Oakwood Dr.
  - Westbound Thru/Right: D (PM Peak)
  - Southbound Left/Thru/Right: F (PM Peak)
- SH-69A & Webb St.
  - Northbound Left/Right: D (AM Peak); F (PM Peak)
- SH-69A & Armin Rd.
  - Northbound Left/Right: F (PM Peak)

All other lane groups operate at LOS C or better. The signalized intersection of US-69 and SH-69A operates at LOS C in the AM peak hour and at LOS F in the PM peak hour with significant queue spillbacks anticipated due to southbound left-turn and westbound approach capacity issues. The signalized intersection of SH-69A and Zarrow Street / Elliott Street operates at LOS B in the AM peak hour and at LOS C in the PM peak hour.

**Figure 13** illustrates the 2030 base plus site traffic on existing network capacity analysis summary for the overall study area; **Figure 14** illustrates the 2030 base plus site traffic on existing network capacity analysis summary for SE 63rd Street adjacent to the development. Detailed results may be found in **Appendix D**.

Figure 13:

# 2030 Base plus Site Traffic on Existing Network Capacity Analysis Summary - Overall

Mixed Use Development North of US-69A - Mid-America Industrial Park  
Pryor Creek, OK

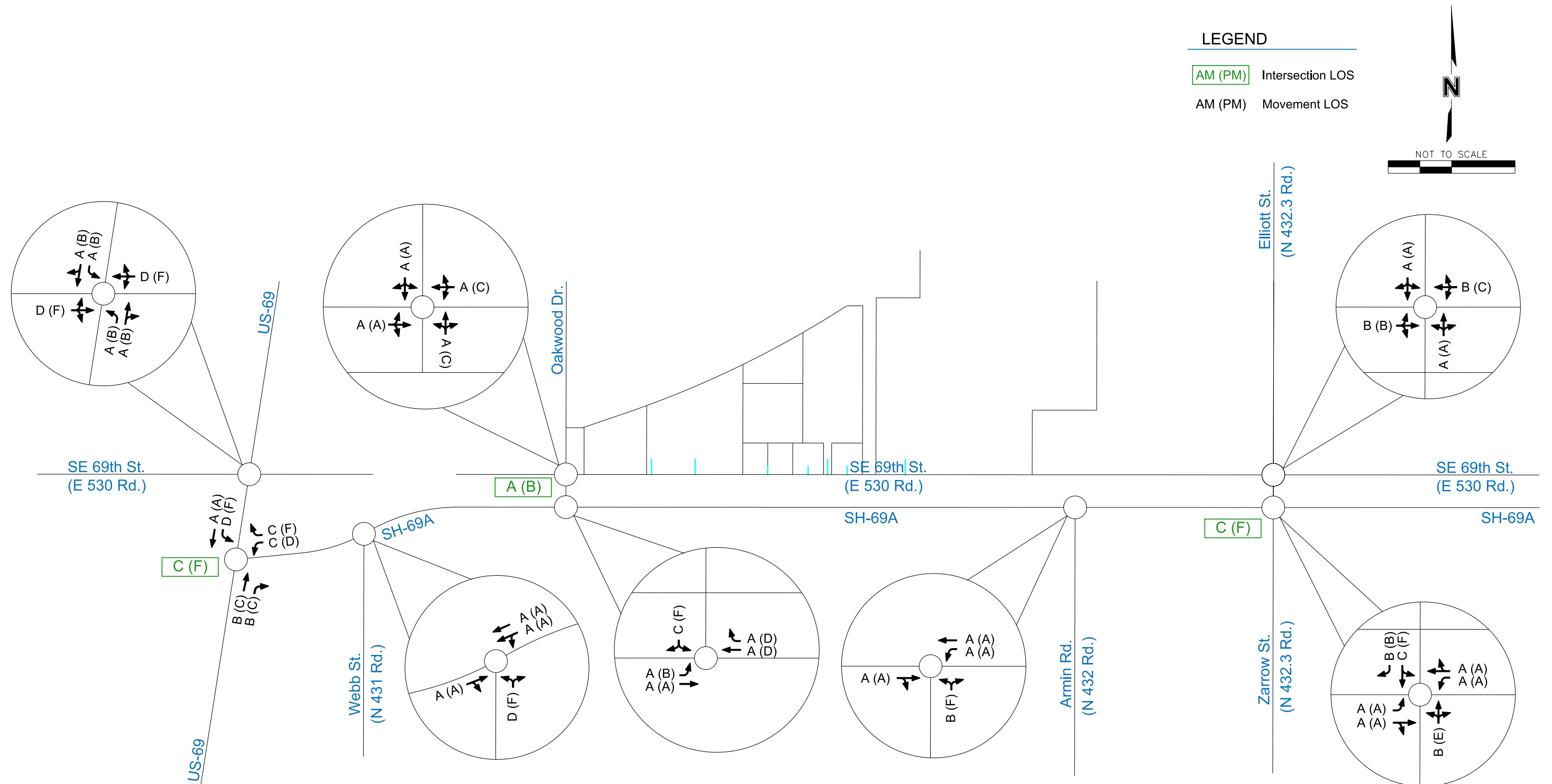
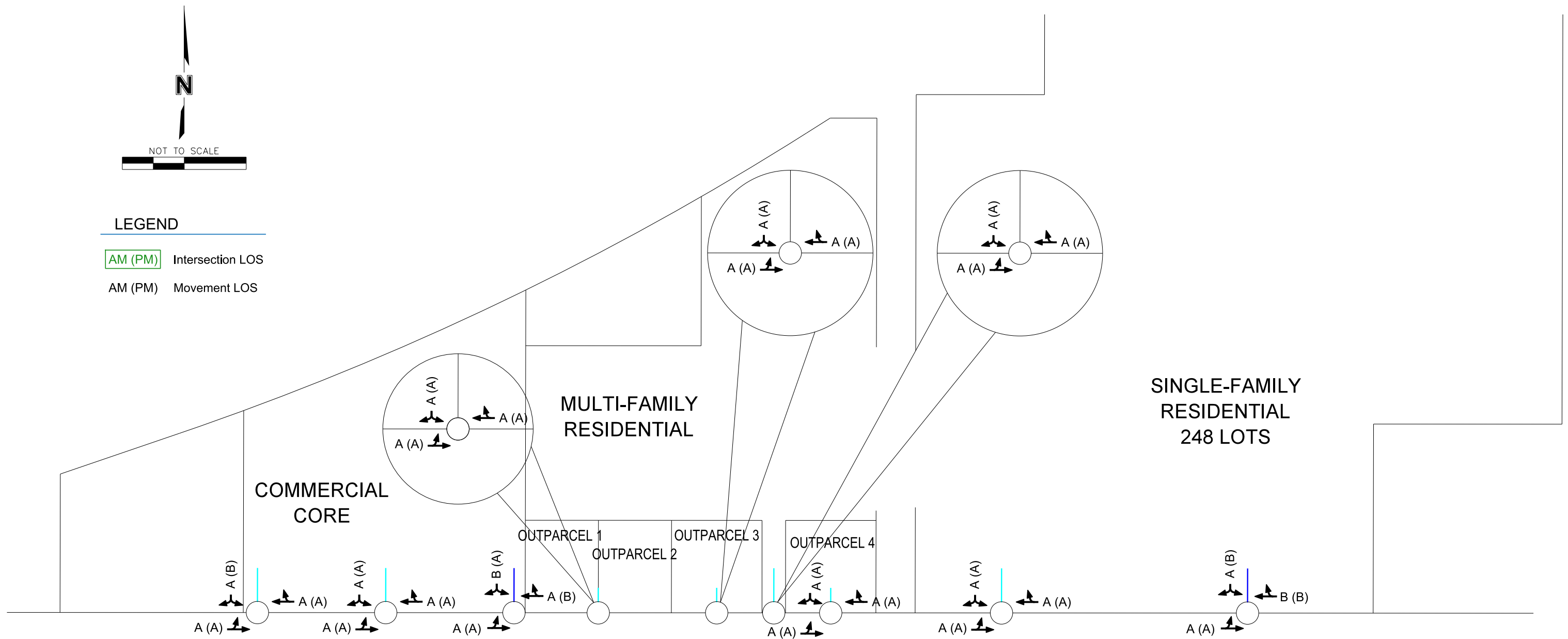


Figure 14:

2030 Base plus Site Traffic on Existing Network Capacity Analysis Summary - Along 69th St. Adjacent to Development

Mixed Use Development North of US-69A - Mid-America Industrial Park  
Pryor Creek, OK



### 6.3 2030 Base plus Site on Improved Network Capacity Analysis

Capacity analysis for 2030 base plus site-generated traffic on the improved network was conducted to analyze expected operations to compare with the 2030 base conditions and the 2030 base plus site-generated traffic on the existing network. Improvements that were incorporated into the improved conditions scenario include turn lane improvements at US-69 and SH-69A, signalization and geometric improvements at Zarrow Street / Elliott Street and SH-69A, signalization and geometric improvements at Oakwood Drive and SH-69A, improvements at Oakwood Drive and 69th Street, and improvements at Elliott Street at 69th Street as described previously in this study.

Results of the analysis indicate lane group LOS D or worse at the following locations:

- US-69 & SE 69th St.
  - Eastbound Left/Thru/Right: D (AM Peak); F (PM Peak)
  - Westbound Left/Thru/Right: D (AM Peak); F (PM Peak)
- SH-69A & Oakwood Dr.
  - Westbound Thru/Right: D (PM Peak)
- SH-69A & Webb St.
  - Northbound Left/Right: D (AM Peak); F (PM Peak)
- SH-69A & Armin Rd.
  - Northbound Left/Right: F (PM Peak)

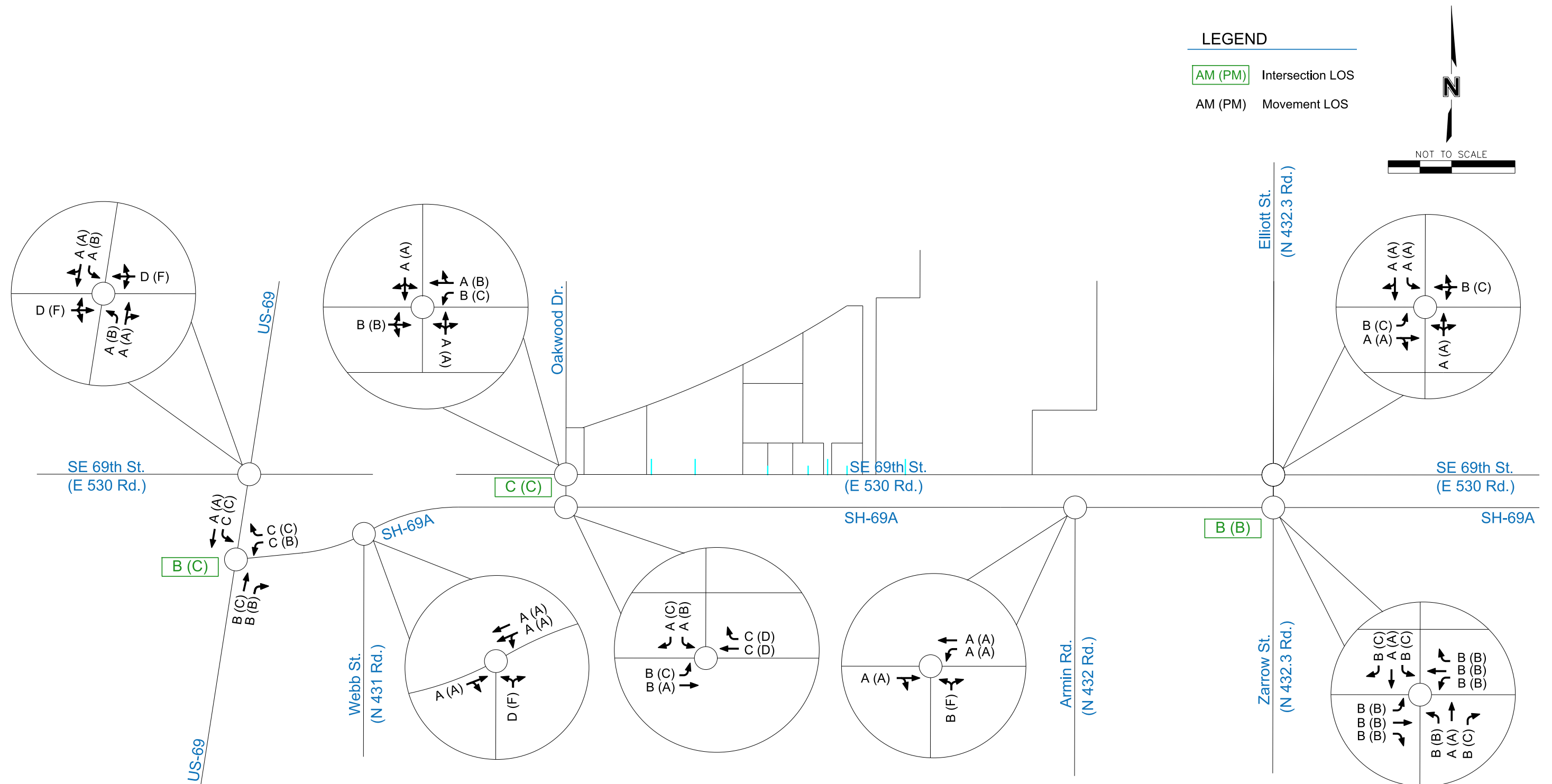
All other lane groups operate at LOS C or better. The signalized intersection of US-69 and SH-69A operates at LOS B in the AM peak hour and at LOS C in the PM peak hour. The proposed signalized intersection of SH-69A and Zarrow Street / Elliott Street operates at LOS B in the AM and PM peak hours.

**Figure 15** illustrates the 2030 base plus site traffic on the improved network capacity analysis summary for the overall study area; **Figure 16** illustrates the 2030 base plus site traffic on the improved network capacity analysis summary for SE 63rd Street adjacent to the development. Detailed results may be found in **Appendix E**.

Figure 15:

# 2030 Base plus Site Traffic on Improved Network Capacity Analysis Summary - Overall

Mixed Use Development North of US-69A - Mid-America Industrial Park  
Pryor Creek, OK





## 7 CONCLUSION

A capacity analysis was performed at study intersections based on the assumed opening year of the site (2019) and at an 11-year horizon year (2030). After a review of the existing conditions along the highway and consideration of the anticipated traffic that would be generated by the proposed site, improvements are recommended below and were included in the base plus site-generated on proposed network capacity analysis. No strict implementation timeline is provided for the construction of all improvements, but improvements should be considered as build-out of the mixed-use development and the greater MAIP area continues and corresponding traffic loads increase. For the purposes of this study, the recommended improvements are divided into two groups: those that should be constructed/installed prior to the opening of the site and those that should be constructed/installed around 75% buildout.

### Prior to Initial Site Opening (~2020)

#### US-69 and SH-69A Intersection

- Update traffic signal timings.

#### SH-69A and Oakwood Drive Intersection

- This intersection is not anticipated to perform at an acceptable level of service during peak hours with its existing traffic control and is recommended to be signalized as soon as signal warrants are met. Until signal warrants are met, Oakwood Drive will be stop-controlled and SH-69A will flow freely.
- A left-turn lane and a right-turn lane should be provided for the southbound approach.
- A 750-foot long eastbound left-turn lane should be provided for the eastbound direction to allow for adequate storage for site-generated traffic headed to the proposed development and for the existing residential traffic turning onto Oakwood Drive. This should be implemented with striping modifications utilizing the existing pavement available.

#### 69th Street and Oakwood Drive Intersection

- The intersection should be converted from all-way stop control to two-way stop control with stop signs located on the eastbound and westbound approaches.
- SE 69th Street should be closed to the west to avoid loading any more traffic onto the SE 69th Street at US-69 intersection due to poor traffic operations at that intersection currently. Local access will have to be retained from one side of 69th Street or the other to all properties.
- Provide an exclusive 150-foot long left-turn lane for the westbound SE 69th Street approach. 69th Street will provide a three-lane section with a two-way left-turn lane

(TWLTL) along the entire frontage of the development.

#### SH-69A and Zarrow St / Elliott St Intersection

- This intersection will not perform at an acceptable level of service during peak hours with its existing traffic control and is recommended to be signalized as soon as signal warrants are met. Until signal warrants are met, Zarrow St / Elliott St will be stop-controlled and SH-69A will flow free.
- As part of a separate project, the developer is relocating Zarrow Street to align with Elliott Street as shown in the improvement figure. A 200-foot long northbound left-turn lane and a right-turn lane will be provided.
- 150-foot long eastbound and westbound exclusive left-turn lanes are recommended.
- A left-turn lane and a right-turn lane should be provided for the southbound approach.

#### 69th Street and Zarrow St/Elliott St Intersection

- An 80-foot long left-turn lane should be provided for the southbound approach primarily to support the addition of the southbound left-turn lane at the Elliott Street intersection just south of this intersection.
- A 150-foot long left-turn lane should be provided for the eastbound SE 69th Street approach.
- The existing two-way stop control (stops on 69th Street) is adequate for this intersection.

### **2027 Horizon (~75% Buildout)**

#### US-69 and SH-69A Intersection

- Modify the existing southbound left-turn lane along US-69 to provide dual left turn lanes for 250 linear feet with a 240-foot taper length.
- Increase the storage length of northbound right-turn lane along US-69 to 250 feet with a 360-foot taper length.
- Provide dual left turn lanes and dual right turn lanes for the westbound approach: A 300 feet storage length for the dual left turn lanes and a 400 feet storage length for the dual right turn lanes should be provided.
- Update traffic signal timings.

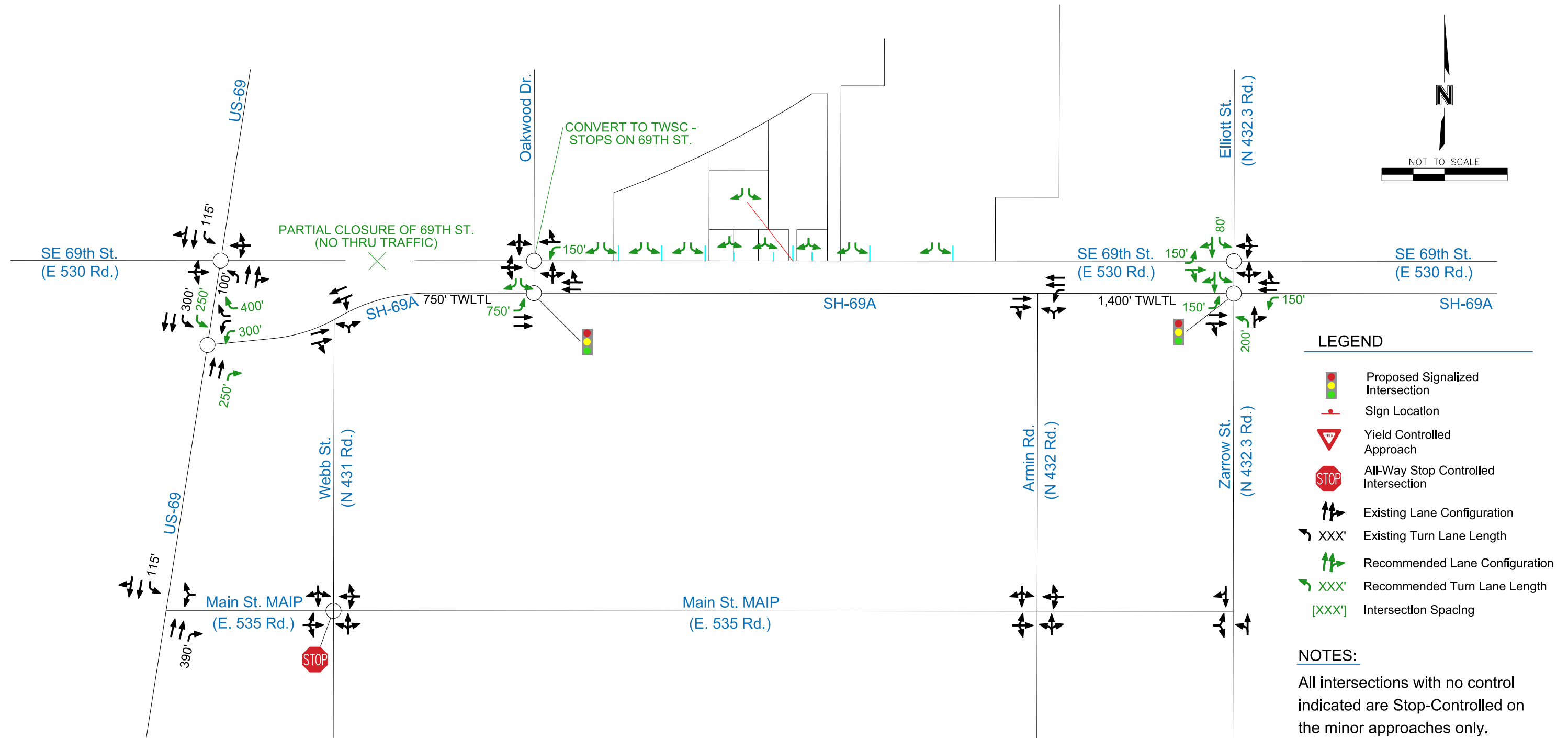


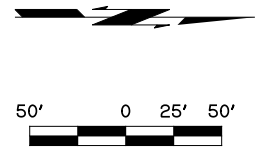
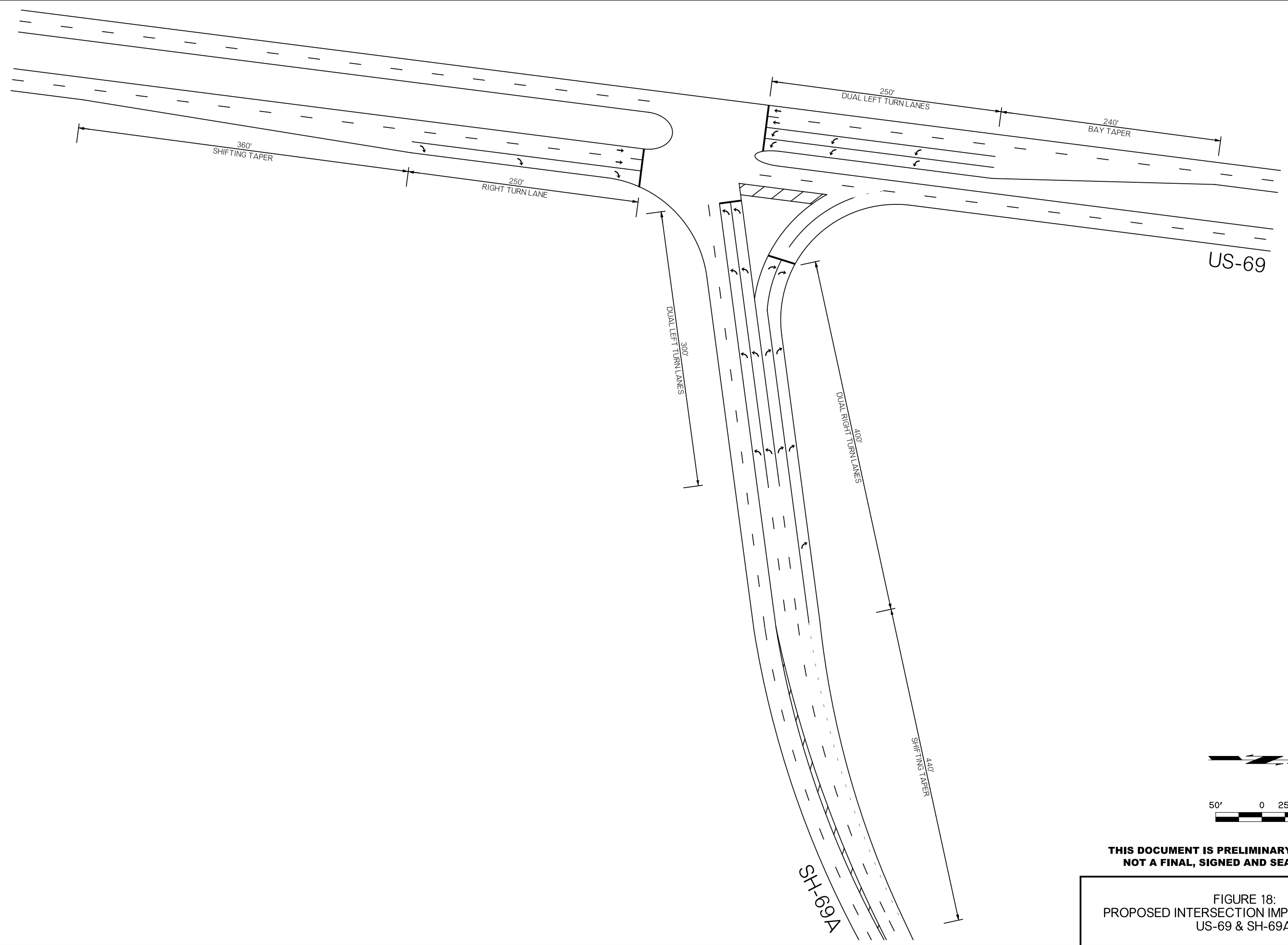
A summary of the recommended improvements is illustrated in **Figure 17**.

A more detailed depiction of the recommended improvements for US-69 and SH-69A is provided in **Figure 18**. A detailed improvement figure for the Oakwood Drive intersection improvements at SH-69A and SE 69th Street is provided in **Figure 19**. A detailed improvement figure for the Zarrow Street / Elliott Street intersection improvements at SH-69A and SE 69th Street is provided in **Figure 20**.

# Figure 17: Recommended Improvements

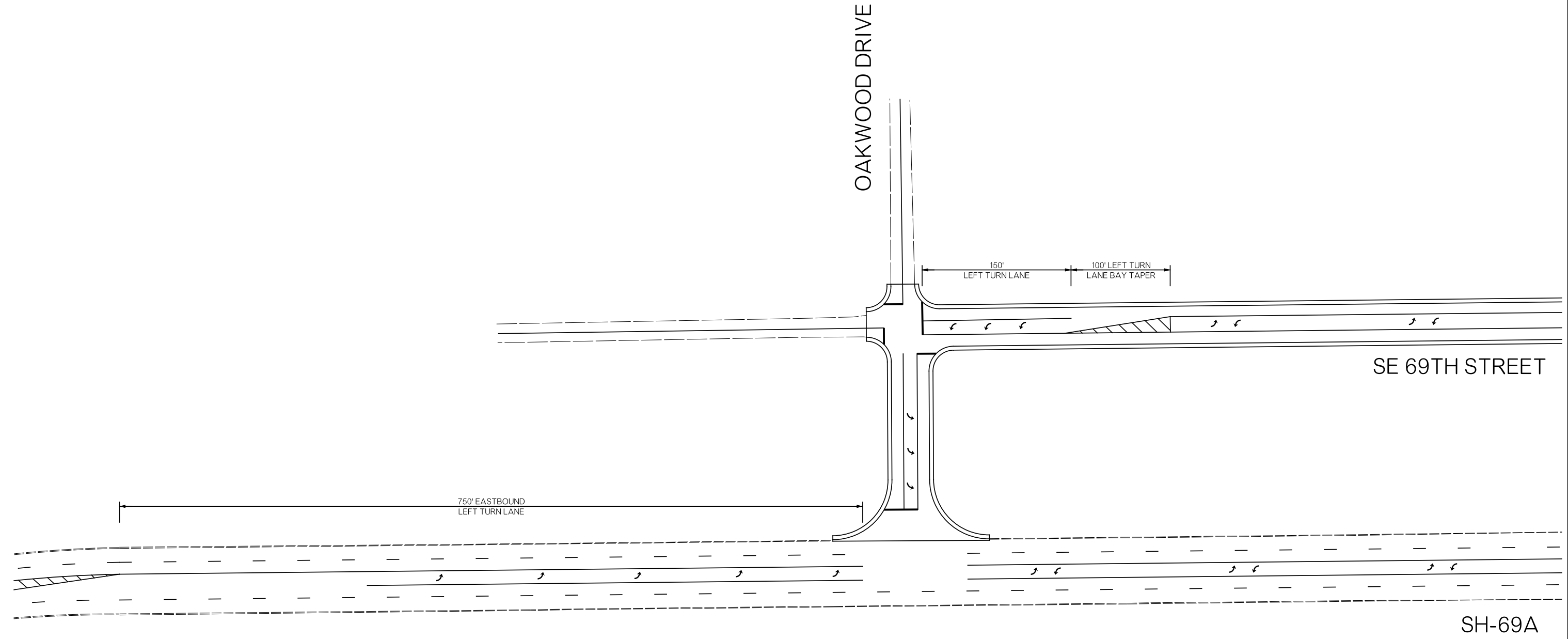
Mixed Use Development North of US-69A - Mid-America Industrial Park  
Pryor Creek, OK





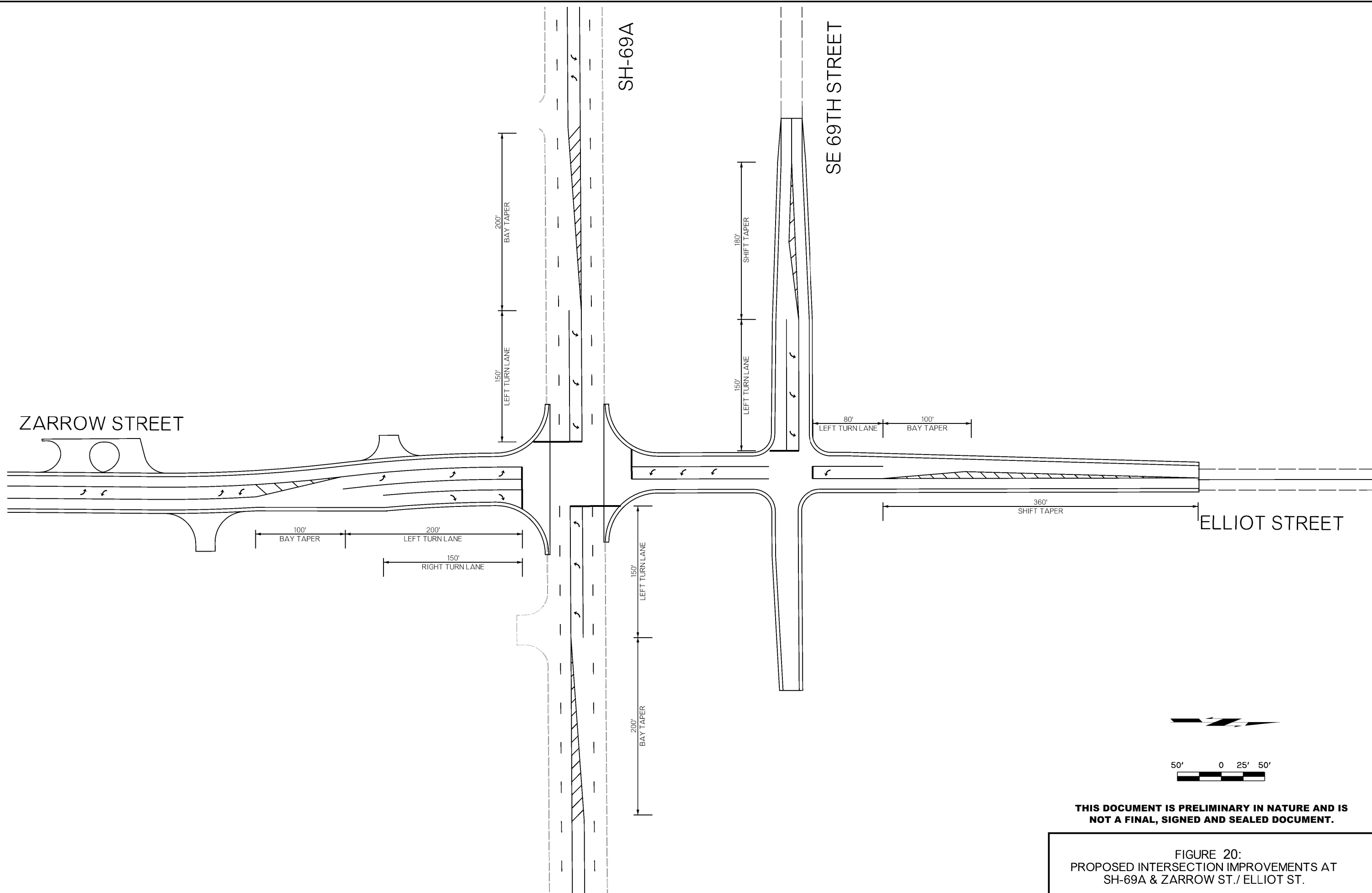
**THIS DOCUMENT IS PRELIMINARY IN NATURE AND IS NOT A FINAL, SIGNED AND SEALED DOCUMENT.**

FIGURE 18:  
PROPOSED INTERSECTION IMPROVEMENTS AT  
US-69 & SH-69A



**THIS DOCUMENT IS PRELIMINARY IN NATURE AND IS NOT A FINAL, SIGNED AND SEALED DOCUMENT.**

FIGURE 19:  
PROPOSED INTERSECTION IMPROVEMENTS AT  
SH-69A & OAKWOOD DR.



**THIS DOCUMENT IS PRELIMINARY IN NATURE AND IS NOT A FINAL, SIGNED AND SEALED DOCUMENT.**

FIGURE 20:  
 PROPOSED INTERSECTION IMPROVEMENTS AT  
 SH-69A & ZARROW ST./ ELLIOT ST.

# **APPENDIX A**

## Count Data

**Elliott St & SE 69th Street - TMC**

Thu Mar 7, 2019

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627685, Location: 36.249387, -95.309958



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Elliott St Southbound						69th St Westbound						Elliott St Northbound						69th St Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2019-03-07 7:00AM	3	35	1	0	39	0	2	1	2	0	5	0	1	25	1	0	27	0	1	1	1	0	3	0	74
7:15AM	0	36	1	0	37	0	0	2	1	0	3	0	1	26	0	0	27	0	3	0	0	0	3	0	70
7:30AM	0	41	3	0	44	0	1	0	0	0	1	0	1	23	1	0	25	0	1	0	1	0	2	0	72
7:45AM	3	51	2	0	56	0	0	0	0	0	0	0	2	27	0	0	29	0	2	0	2	0	4	0	89
Hourly Total	6	163	7	0	176	0	3	3	3	0	9	0	5	101	2	0	108	0	7	1	4	0	12	0	305
8:00AM	2	39	1	0	42	0	0	0	0	0	0	0	0	30	0	0	30	0	3	0	5	0	8	0	80
8:15AM	3	38	1	0	42	0	1	0	0	0	1	0	0	23	0	0	23	0	2	0	2	0	4	0	70
8:30AM	1	21	0	0	22	0	0	1	0	0	1	0	0	11	2	0	13	0	5	0	1	0	6	0	42
8:45AM	3	17	1	0	21	0	2	0	1	0	3	0	2	19	1	0	22	0	2	0	1	0	3	0	49
Hourly Total	9	115	3	0	127	0	3	1	1	0	5	0	2	83	3	0	88	0	12	0	9	0	21	0	241
4:00PM	2	21	1	0	24	0	4	0	2	0	6	0	2	66	4	0	72	0	2	1	1	0	4	0	106
4:15PM	1	28	0	0	29	0	5	0	0	0	5	0	1	30	1	0	32	0	1	1	1	0	3	0	69
4:30PM	4	13	0	0	17	0	0	0	1	0	1	0	0	74	2	0	76	0	1	1	1	0	3	0	97
4:45PM	1	21	1	0	23	0	3	0	3	0	6	0	1	37	4	0	42	0	2	1	0	0	3	0	74
Hourly Total	8	83	2	0	93	0	12	0	6	0	18	0	4	207	11	0	222	0	6	4	3	0	13	0	346
5:00PM	1	21	3	0	25	0	0	0	4	0	4	0	0	76	2	0	78	0	0	0	4	0	4	0	111
5:15PM	1	37	2	0	40	0	0	1	0	0	1	0	0	80	3	0	83	0	1	0	1	0	2	0	126
5:30PM	1	28	1	0	30	0	2	0	0	0	2	0	0	62	0	0	62	0	3	1	2	0	6	0	100
5:45PM	1	23	0	0	24	0	0	0	0	0	0	0	0	32	1	0	33	0	1	0	2	0	3	0	60
Hourly Total	4	109	6	0	119	0	2	1	4	0	7	0	0	250	6	0	256	0	5	1	9	0	15	0	397
<b>Total</b>	27	470	18	0	515	0	20	5	14	0	39	0	11	641	22	0	674	0	30	6	25	0	61	0	1289
<b>% Approach</b>	5.2%	91.3%	3.5%	0%	-	-	51.3%	12.8%	35.9%	0%	-	-	1.6%	95.1%	3.3%	0%	-	-	49.2%	9.8%	41.0%	0%	-	-	-
<b>% Total</b>	2.1%	36.5%	1.4%	0%	40.0%	-	1.6%	0.4%	1.1%	0%	3.0%	-	0.9%	49.7%	1.7%	0%	52.3%	-	2.3%	0.5%	1.9%	0%	4.7%	-	-
<b>Lights</b>	27	467	18	0	512	-	18	5	13	0	36	-	9	633	22	0	664	-	30	6	25	0	61	-	1273
<b>% Lights</b>	100%	99.4%	100%	0%	99.4%	-	90.0%	100%	92.9%	0%	92.3%	-	81.8%	98.8%	100%	0%	98.5%	-	100%	100%	100%	0%	100%	-	98.8%
<b>Articulated Trucks and Single-Unit Trucks</b>	0	2	0	0	2	-	0	0	1	0	1	-	2	7	0	0	9	-	0	0	0	0	0	-	12
<b>% Articulated Trucks and Single-Unit Trucks</b>	0%	0.4%	0%	0%	0.4%	-	0%	0%	7.1%	0%	2.6%	-	18.2%	1.1%	0%	0%	1.3%	-	0%	0%	0%	0%	0%	-	0.9%
<b>Buses</b>	0	1	0	0	1	-	2	0	0	0	2	-	0	1	0	0	1	-	0	0	0	0	0	-	4
<b>% Buses</b>	0%	0.2%	0%	0%	0.2%	-	10.0%	0%	0%	0%	5.1%	-	0%	0.2%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0.3%
<b>Pedestrians</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
<b>% Pedestrians</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
<b>% Bicycles on Crosswalk</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Elliott St & SE 69th Street - TMC**

Thu Mar 7, 2019

Full Length (7 AM-9 AM, 4 PM-6 PM)

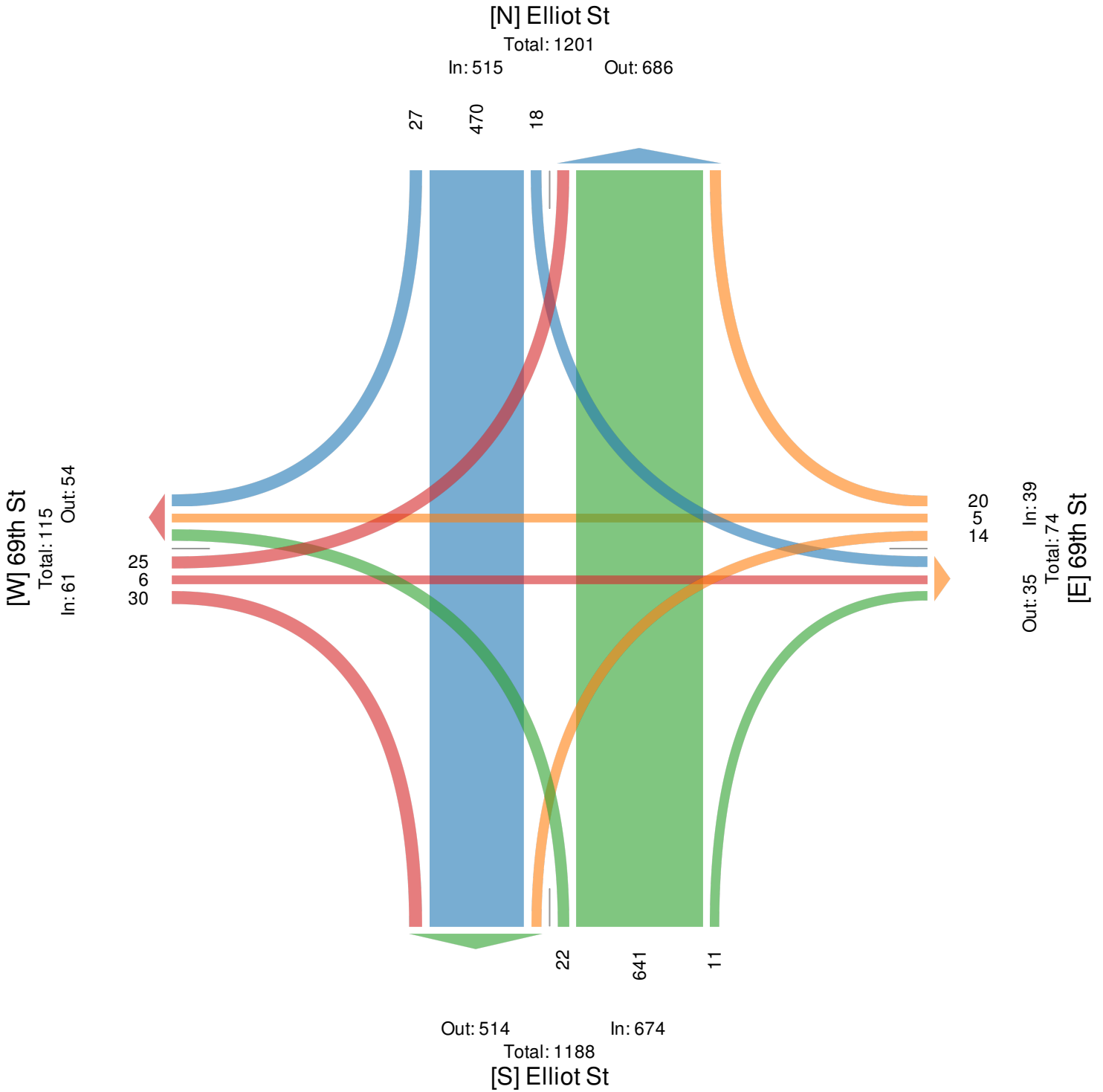
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627685, Location: 36.249387, -95.309958



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US





**Elliott St & SE 69th Street - TMC**

Thu Mar 7, 2019

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627685, Location: 36.249387, -95.309958



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Elliott St Southbound						69th St Westbound						Elliott St Northbound						69th St Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2019-03-07 7:15AM	0	36	1	0	37	0	0	2	1	0	3	0	1	26	0	0	27	0	3	0	0	0	3	0	70
7:30AM	0	41	3	0	44	0	1	0	0	0	1	0	1	23	1	0	25	0	1	0	1	0	2	0	72
7:45AM	3	51	2	0	56	0	0	0	0	0	0	0	2	27	0	0	29	0	2	0	2	0	4	0	89
8:00AM	2	39	1	0	42	0	0	0	0	0	0	0	0	30	0	0	30	0	3	0	5	0	8	0	80
<b>Total</b>	5	167	7	0	179	0	1	2	1	0	4	0	4	106	1	0	111	0	9	0	8	0	17	0	311
<b>% Approach</b>	2.8%	93.3%	3.9%	0%	-	-	25.0%	50.0%	25.0%	0%	-	-	3.6%	95.5%	0.9%	0%	-	-	52.9%	0%	47.1%	0%	-	-	-
<b>% Total</b>	1.6%	53.7%	2.3%	0%	57.6%	-	0.3%	0.6%	0.3%	0%	1.3%	-	1.3%	34.1%	0.3%	0%	35.7%	-	2.9%	0%	2.6%	0%	5.5%	-	-
<b>PHF</b>	0.417	0.819	0.583	-	0.799	-	0.250	0.250	0.250	-	0.333	-	0.500	0.883	0.250	-	0.925	-	0.750	-	0.400	-	0.531	-	0.874
<b>Lights</b>	5	164	7	0	176	-	0	2	1	0	3	-	4	105	1	0	110	-	9	0	8	0	17	-	306
<b>% Lights</b>	100%	98.2%	100%	0%	98.3%	-	0%	100%	100%	0%	75.0%	-	100%	99.1%	100%	0%	99.1%	-	100%	0%	100%	0%	100%	-	98.4%
<b>Articulated Trucks and Single-Unit Trucks</b>	0	2	0	0	2	-	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	3
<b>% Articulated Trucks and Single-Unit Trucks</b>	0%	1.2%	0%	0%	1.1%	-	0%	0%	0%	0%	0%	-	0%	0.9%	0%	0%	0.9%	-	0%	0%	0%	0%	0%	-	1.0%
<b>Buses</b>	0	1	0	0	1	-	1	0	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	2
<b>% Buses</b>	0%	0.6%	0%	0%	0.6%	-	100%	0%	0%	0%	25.0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.6%
<b>Pedestrians</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
<b>% Pedestrians</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
<b>% Bicycles on Crosswalk</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Elliott St & SE 69th Street - TMC**

Thu Mar 7, 2019

AM Peak (7:15 AM - 8:15 AM)

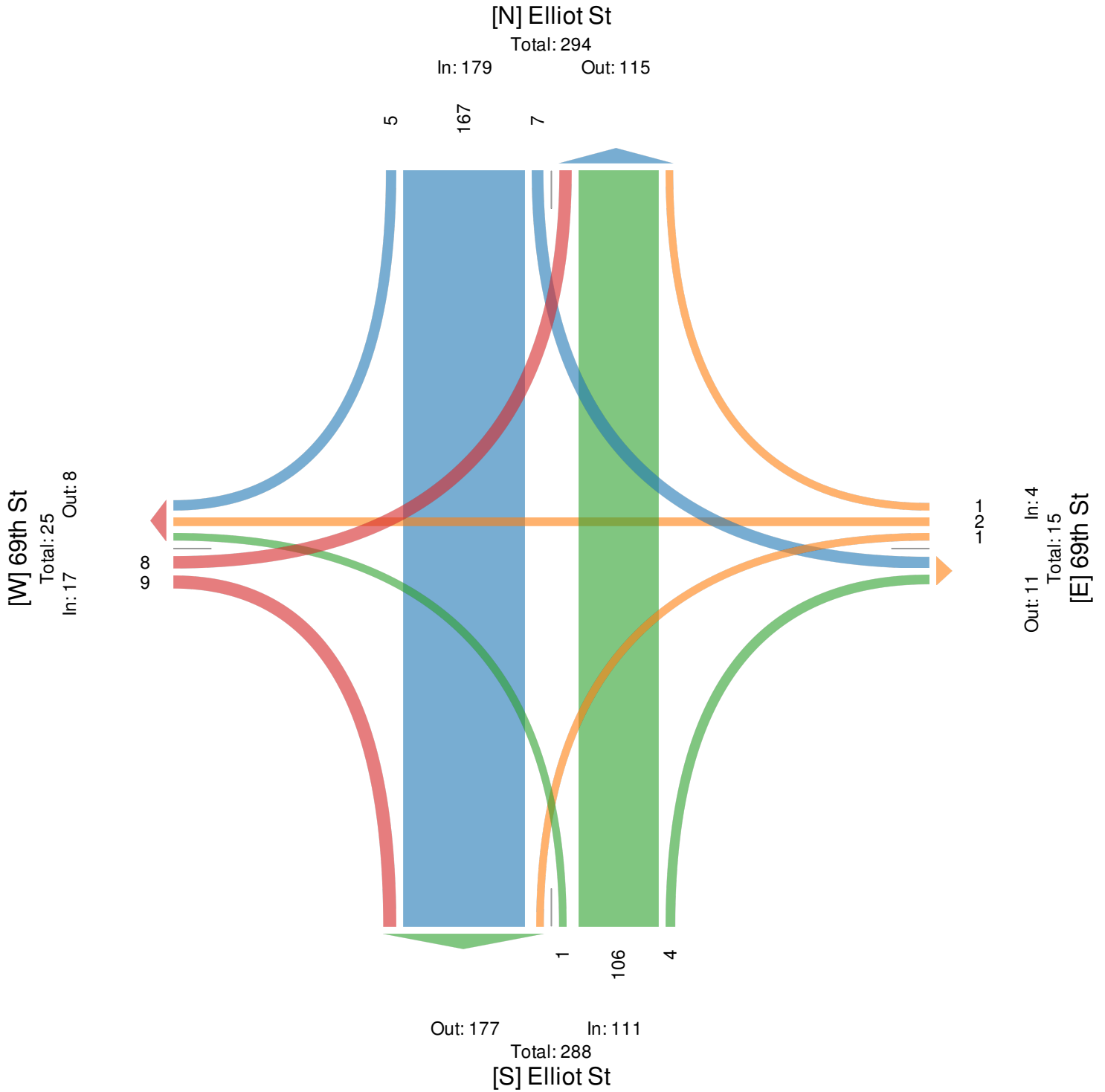
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627685, Location: 36.249387, -95.309958



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



**Elliott St & SE 69th Street - TMC**

Thu Mar 7, 2019

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627685, Location: 36.249387, -95.309958



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Elliott St Southbound						69th St Westbound						Elliott St Northbound						69th St Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
2019-03-07 4:45PM	1	21	1	0	23	0	3	0	3	0	6	0	1	37	4	0	42	0	2	1	0	0	3	0	74
5:00PM	1	21	3	0	25	0	0	0	4	0	4	0	0	76	2	0	78	0	0	0	4	0	4	0	111
5:15PM	1	37	2	0	40	0	0	1	0	0	1	0	0	80	3	0	83	0	1	0	1	0	2	0	126
5:30PM	1	28	1	0	30	0	2	0	0	0	2	0	0	62	0	0	62	0	3	1	2	0	6	0	100
<b>Total</b>	4	107	7	0	118	0	5	1	7	0	13	0	1	255	9	0	265	0	6	2	7	0	15	0	411
<b>% Approach</b>	3.4%	90.7%	5.9%	0%	-	-	38.5%	7.7%	53.8%	0%	-	-	0.4%	96.2%	3.4%	0%	-	-	40.0%	13.3%	46.7%	0%	-	-	-
<b>% Total</b>	1.0%	26.0%	1.7%	0%	28.7%	-	1.2%	0.2%	1.7%	0%	3.2%	-	0.2%	62.0%	2.2%	0%	64.5%	-	1.5%	0.5%	1.7%	0%	3.6%	-	-
<b>PHF</b>	1.000	0.723	0.583	-	0.738	-	0.417	0.250	0.438	-	0.542	-	0.250	0.797	0.563	-	0.798	-	0.500	0.500	0.438	-	0.625	-	0.815
<b>Lights</b>	4	107	7	0	118	-	5	1	6	0	12	-	1	255	9	0	265	-	6	2	7	0	15	-	410
<b>% Lights</b>	100%	100%	100%	0%	100%	-	100%	100%	85.7%	0%	92.3%	-	100%	100%	100%	0%	100%	-	100%	100%	100%	0%	100%	-	99.8%
<b>Articulated Trucks and Single-Unit Trucks</b>	0	0	0	0	0	-	0	0	1	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	1
<b>% Articulated Trucks and Single-Unit Trucks</b>	0%	0%	0%	0%	0%	-	0%	0%	14.3%	0%	7.7%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.2%
<b>Buses</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
<b>% Buses</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
<b>% Pedestrians</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
<b>% Bicycles on Crosswalk</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**Elliott St & SE 69th Street - TMC**

Thu Mar 7, 2019

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

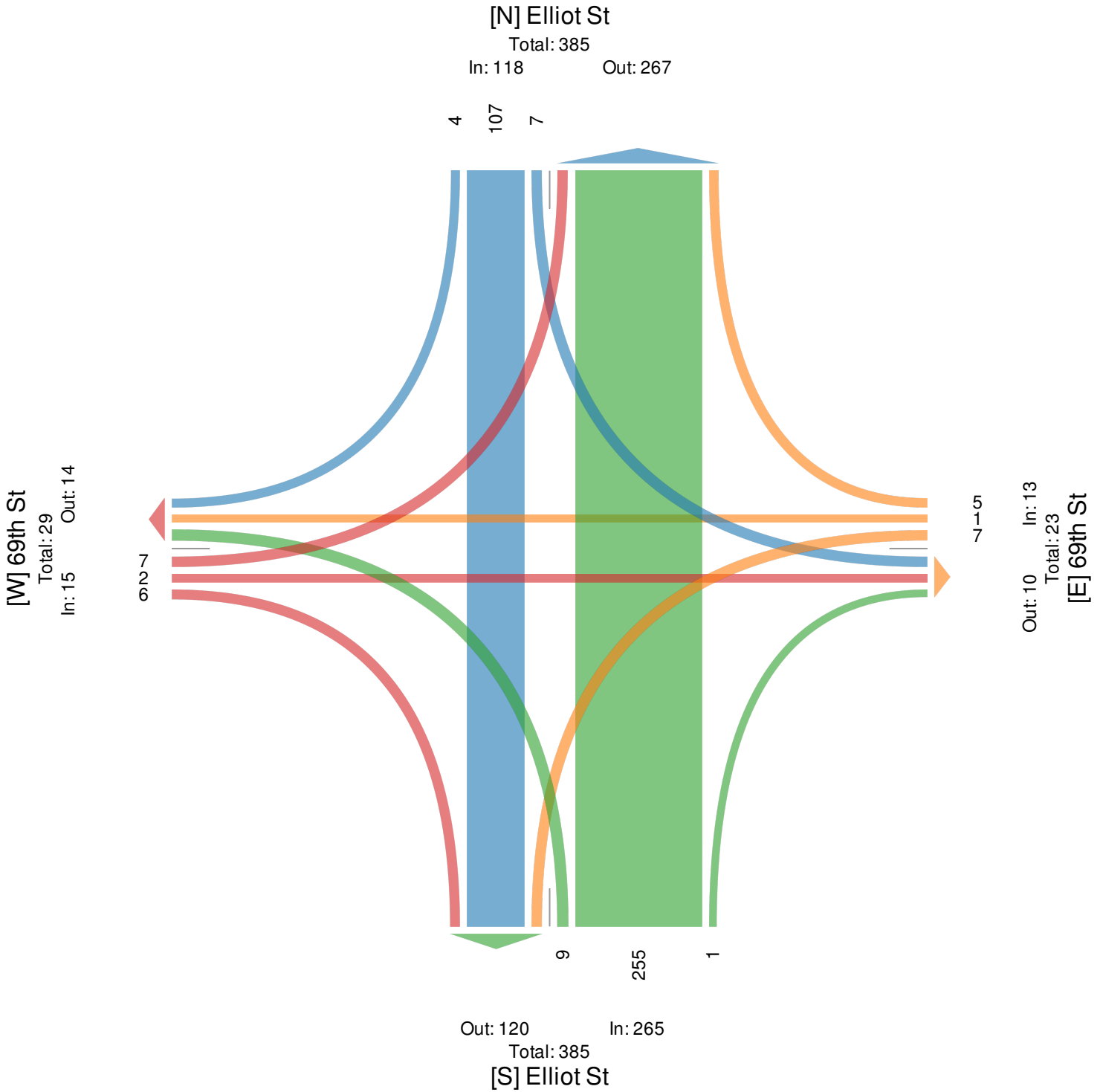
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627685, Location: 36.249387, -95.309958



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



**US-69 & SE 69th St - TMC**

Thu Mar 7, 2019

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627682, Location: 36.249334, -95.335894



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	US-69 Southbound					69th St Westbound					US-69 Northbound					69th St Eastbound					Int				
	R	T	L	U	App Ped*	R	T	L	U	App Ped*	R	T	L	U	App Ped*	R	T	L	U	App Ped*					
2019-03-07 7:00AM	1	107	1	0	109	0	3	0	0	0	3	0	2	105	2	0	109	0	3	2	1	0	6	0	227
7:15AM	1	121	0	0	122	0	0	0	1	0	1	0	4	144	5	0	153	0	9	0	3	0	12	0	288
7:30AM	1	146	0	1	148	0	3	1	4	0	8	0	1	122	2	0	125	0	13	0	7	0	20	0	301
7:45AM	1	139	1	0	141	0	2	1	3	0	6	0	3	167	2	0	172	0	8	2	5	0	15	0	334
Hourly Total	4	513	2	1	520	0	8	2	8	0	18	0	10	538	11	0	559	0	33	4	16	0	53	0	1150
8:00AM	3	104	1	0	108	0	1	0	2	0	3	0	3	111	4	0	118	0	7	1	4	0	12	0	241
8:15AM	1	119	1	0	121	0	0	1	1	0	2	0	2	141	2	0	145	0	5	1	2	0	8	0	276
8:30AM	3	128	0	0	131	0	0	1	3	0	4	0	1	129	3	0	133	0	3	0	4	0	7	0	275
8:45AM	0	103	1	0	104	0	3	0	1	0	4	0	4	128	2	0	134	0	2	0	6	0	8	0	250
Hourly Total	7	454	3	0	464	0	4	2	7	0	13	0	10	509	11	0	530	0	17	2	16	0	35	0	1042
4:00PM	4	165	0	0	169	0	1	2	2	0	5	0	13	218	17	0	248	0	2	2	3	0	7	0	429
4:15PM	5	155	6	0	166	0	2	0	1	0	3	0	8	203	9	0	220	0	4	1	3	0	8	0	397
4:30PM	4	159	1	0	164	0	1	2	1	0	4	0	6	233	16	0	255	0	4	1	1	0	6	0	429
4:45PM	3	152	2	0	157	0	3	0	2	0	5	0	4	209	8	1	222	0	0	0	1	0	1	0	385
Hourly Total	16	631	9	0	656	0	7	4	6	0	17	0	31	863	50	1	945	0	10	4	8	0	22	0	1640
5:00PM	5	138	2	0	145	0	0	1	1	0	2	0	11	255	22	0	288	0	7	0	5	0	12	0	447
5:15PM	1	167	3	2	173	0	2	0	1	0	3	0	21	248	10	0	279	0	2	0	2	0	4	0	459
5:30PM	3	132	6	1	142	0	6	1	3	0	10	0	23	231	14	1	269	0	1	2	2	0	5	0	426
5:45PM	9	145	1	0	155	0	1	1	5	0	7	0	3	128	5	0	136	0	5	0	1	0	6	0	304
Hourly Total	18	582	12	3	615	0	9	3	10	0	22	0	58	862	51	1	972	0	15	2	10	0	27	0	1636
<b>Total</b>	<b>45</b>	<b>2180</b>	<b>26</b>	<b>4</b>	<b>2255</b>	<b>0</b>	<b>28</b>	<b>11</b>	<b>31</b>	<b>0</b>	<b>70</b>	<b>0</b>	<b>109</b>	<b>2772</b>	<b>123</b>	<b>2</b>	<b>3006</b>	<b>0</b>	<b>75</b>	<b>12</b>	<b>50</b>	<b>0</b>	<b>137</b>	<b>0</b>	<b>5468</b>
<b>% Approach</b>	2.0%	96.7%	1.2%	0.2%	-	-	40.0%	15.7%	44.3%	0%	-	-	3.6%	92.2%	4.1%	0.1%	-	-	54.7%	8.8%	36.5%	0%	-	-	-
<b>% Total</b>	0.8%	39.9%	0.5%	0.1%	41.2%	-	0.5%	0.2%	0.6%	0%	1.3%	-	2.0%	50.7%	2.2%	0%	55.0%	-	1.4%	0.2%	0.9%	0%	2.5%	-	-
<b>Lights</b>	43	1676	25	4	1748	-	27	11	29	0	67	-	101	2268	116	2	2487	-	71	12	49	0	132	-	4434
<b>% Lights</b>	95.6%	76.9%	96.2%	100%	77.5%	-	96.4%	100%	93.5%	0%	95.7%	-	92.7%	81.8%	94.3%	100%	82.7%	-	94.7%	100%	98.0%	0%	96.4%	-	81.1%
<b>Articulated Trucks and Single-Unit Trucks</b>	2	504	1	0	507	-	1	0	2	0	3	-	8	497	7	0	512	-	4	0	1	0	5	-	1027
<b>% Articulated Trucks and Single-Unit Trucks</b>	4.4%	23.1%	3.8%	0%	22.5%	-	3.6%	0%	6.5%	0%	4.3%	-	7.3%	17.9%	5.7%	0%	17.0%	-	5.3%	0%	2.0%	0%	3.6%	-	18.8%
<b>Buses</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	7	0	0	7	-	0	0	0	0	0	-	7
<b>% Buses</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0.1%
<b>Pedestrians</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	0
<b>% Pedestrians</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	-	0
<b>% Bicycles on Crosswalk</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**US-69 & SE 69th St - TMC**

Thu Mar 7, 2019

Full Length (7 AM-9 AM, 4 PM-6 PM)

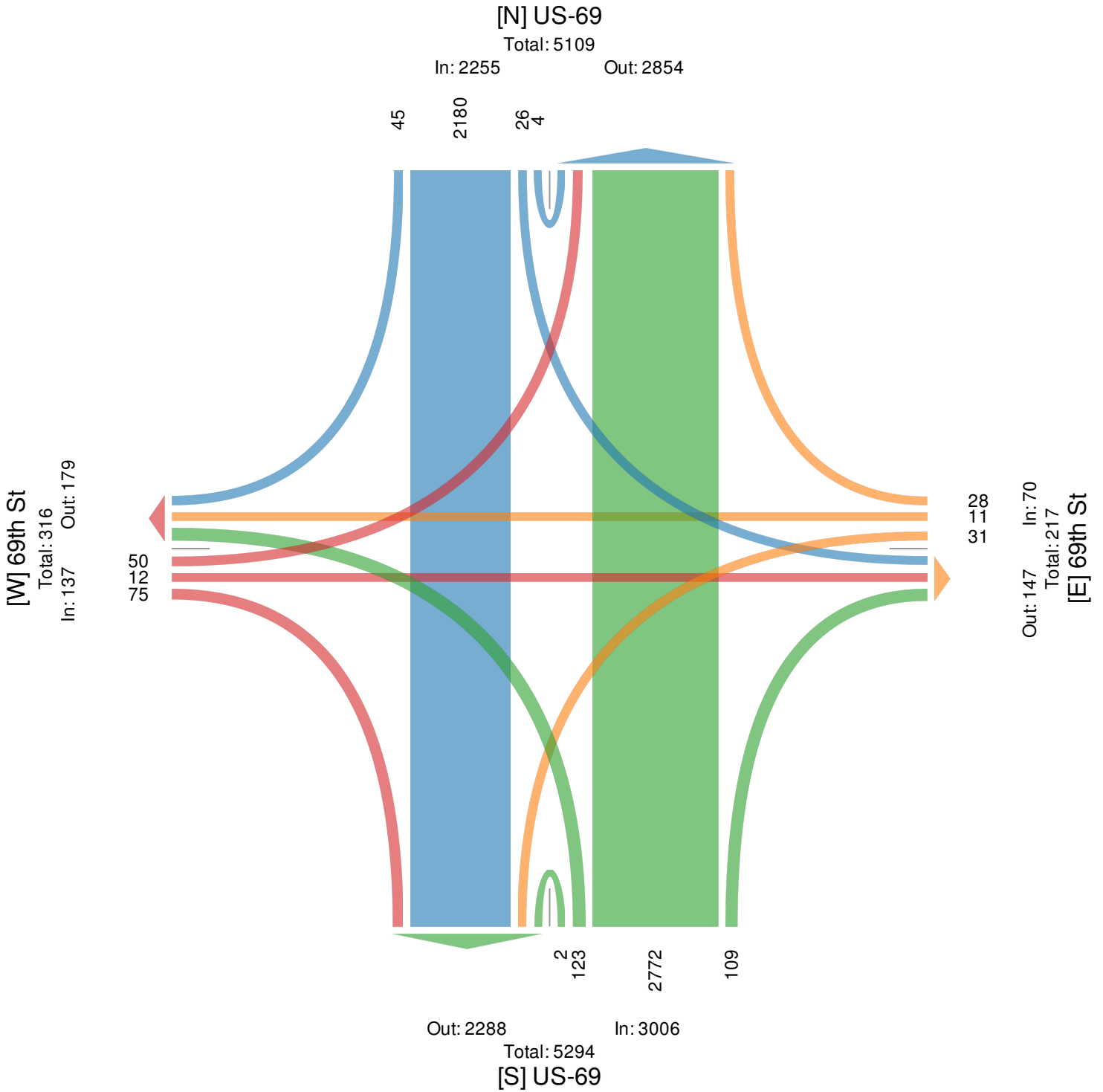
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627682, Location: 36.249334, -95.335894



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



**US-69 & SE 69th St - TMC**

Thu Mar 7, 2019

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627682, Location: 36.249334, -95.335894



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	US-69 Southbound						69th St Westbound						US-69 Northbound						69th St Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2019-03-07 7:15AM	1	121	0	0	122	0	0	0	1	0	1	0	4	144	5	0	153	0	9	0	3	0	12	0	288
7:30AM	1	146	0	1	148	0	3	1	4	0	8	0	1	122	2	0	125	0	13	0	7	0	20	0	301
7:45AM	1	139	1	0	141	0	2	1	3	0	6	0	3	167	2	0	172	0	8	2	5	0	15	0	334
8:00AM	3	104	1	0	108	0	1	0	2	0	3	0	3	111	4	0	118	0	7	1	4	0	12	0	241
<b>Total</b>	6	510	2	1	519	0	6	2	10	0	18	0	11	544	13	0	568	0	37	3	19	0	59	0	1164
<b>% Approach</b>	1.2%	98.3%	0.4%	0.2%	-	-	33.3%	11.1%	55.6%	0%	-	-	1.9%	95.8%	2.3%	0%	-	-	62.7%	5.1%	32.2%	0%	-	-	-
<b>% Total</b>	0.5%	43.8%	0.2%	0.1%	44.6%	-	0.5%	0.2%	0.9%	0%	1.5%	-	0.9%	46.7%	1.1%	0%	48.8%	-	3.2%	0.3%	1.6%	0%	5.1%	-	-
<b>PHF</b>	0.500	0.873	0.500	0.250	0.877	-	0.500	0.500	0.625	-	0.563	-	0.688	0.814	0.650	-	0.826	-	0.712	0.375	0.679	-	0.738	-	0.871
<b>Lights</b>	6	400	2	1	409	-	6	2	8	0	16	-	9	435	11	0	455	-	36	3	18	0	57	-	937
<b>% Lights</b>	100%	78.4%	100%	100%	78.8%	-	100%	100%	80.0%	0%	88.9%	-	81.8%	80.0%	84.6%	0%	80.1%	-	97.3%	100%	94.7%	0%	96.6%	-	80.5%
<b>Articulated Trucks and Single-Unit Trucks</b>	0	110	0	0	110	-	0	0	2	0	2	-	2	107	2	0	111	-	1	0	1	0	2	-	225
<b>% Articulated Trucks and Single-Unit Trucks</b>	0%	21.6%	0%	0%	21.2%	-	0%	0%	20.0%	0%	11.1%	-	18.2%	19.7%	15.4%	0%	19.5%	-	2.7%	0%	5.3%	0%	3.4%	-	19.3%
<b>Buses</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	2	0	0	2	-	0	0	0	0	0	-	2
<b>% Buses</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.4%	0%	0%	0.4%	-	0%	0%	0%	0%	0%	-	0.2%
<b>Pedestrians</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
<b>% Pedestrians</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
<b>% Bicycles on Crosswalk</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**US-69 & SE 69th St - TMC**

Thu Mar 7, 2019

AM Peak (7:15 AM - 8:15 AM)

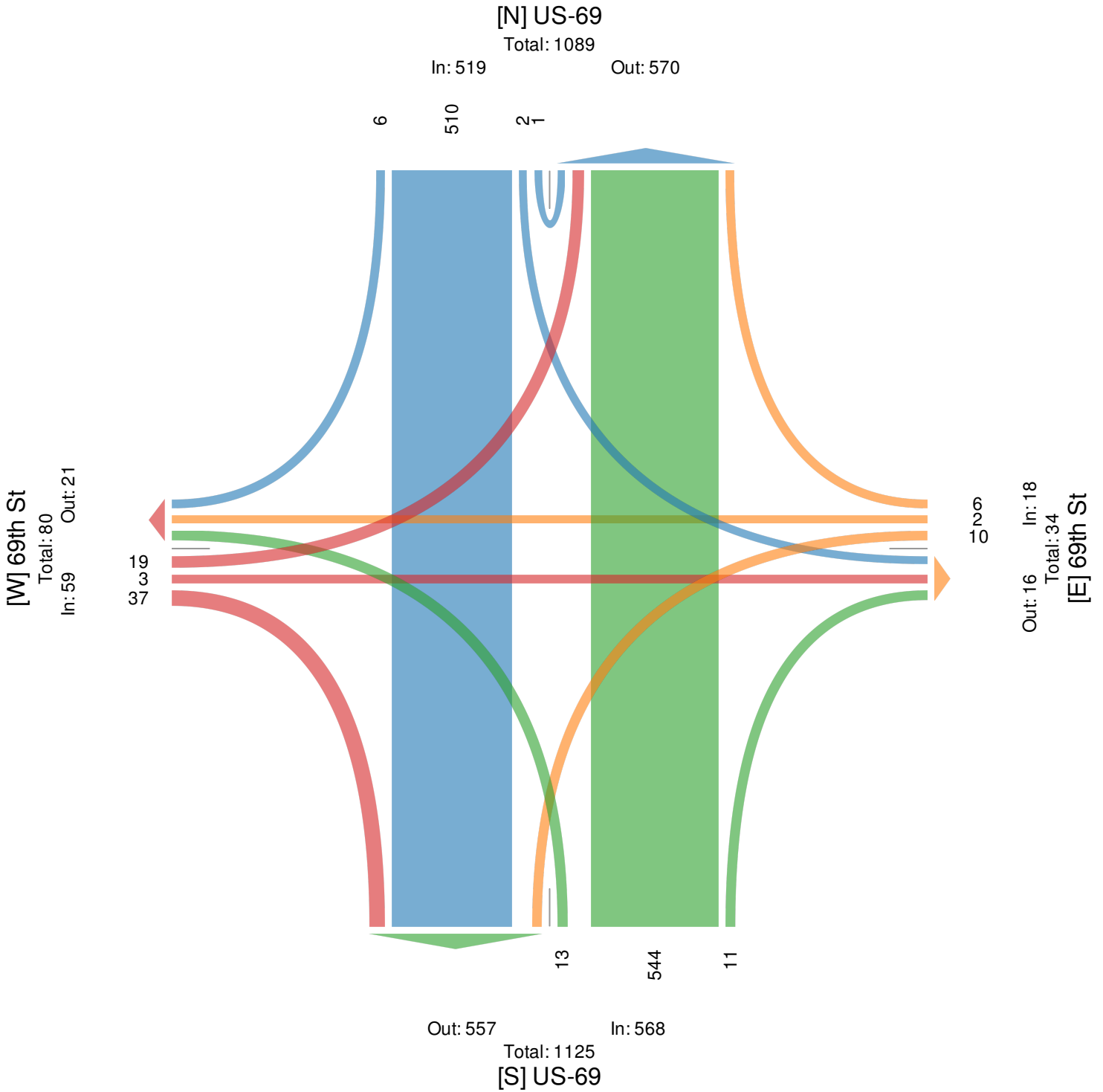
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627682, Location: 36.249334, -95.335894



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US





**US-69 & SE 69th St - TMC**

Thu Mar 7, 2019

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627682, Location: 36.249334, -95.335894



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	US-69 Southbound						69th St Westbound						US-69 Northbound						69th St Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2019-03-07 4:30PM	4	159	1	0	164	0	1	2	1	0	4	0	6	233	16	0	255	0	4	1	1	0	6	0	429
4:45PM	3	152	2	0	157	0	3	0	2	0	5	0	4	209	8	1	222	0	0	0	1	0	1	0	385
5:00PM	5	138	2	0	145	0	0	1	1	0	2	0	11	255	22	0	288	0	7	0	5	0	12	0	447
5:15PM	1	167	3	2	173	0	2	0	1	0	3	0	21	248	10	0	279	0	2	0	2	0	4	0	459
<b>Total</b>	13	616	8	2	639	0	6	3	5	0	14	0	42	945	56	1	1044	0	13	1	9	0	23	0	1720
<b>% Approach</b>	2.0%	96.4%	1.3%	0.3%	-	-	42.9%	21.4%	35.7%	0%	-	-	4.0%	90.5%	5.4%	0.1%	-	-	56.5%	4.3%	39.1%	0%	-	-	-
<b>% Total</b>	0.8%	35.8%	0.5%	0.1%	37.2%	-	0.3%	0.2%	0.3%	0%	0.8%	-	2.4%	54.9%	3.3%	0.1%	60.7%	-	0.8%	0.1%	0.5%	0%	1.3%	-	-
<b>PHF</b>	0.650	0.922	0.667	0.250	0.923	-	0.500	0.375	0.625	-	0.700	-	0.500	0.926	0.636	0.250	0.906	-	0.464	0.250	0.450	-	0.479	-	0.937
<b>Lights</b>	13	492	8	2	515	-	6	3	5	0	14	-	40	784	56	1	881	-	11	1	9	0	21	-	1431
<b>% Lights</b>	100%	79.9%	100%	100%	80.6%	-	100%	100%	100%	0%	100%	-	95.2%	83.0%	100%	100%	84.4%	-	84.6%	100%	100%	0%	91.3%	-	83.2%
<b>Articulated Trucks and Single-Unit Trucks</b>	0	124	0	0	124	-	0	0	0	0	0	-	2	158	0	0	160	-	2	0	0	0	2	-	286
<b>% Articulated Trucks and Single-Unit Trucks</b>	0%	20.1%	0%	0%	19.4%	-	0%	0%	0%	0%	0%	-	4.8%	16.7%	0%	0%	15.3%	-	15.4%	0%	0%	0%	8.7%	-	16.6%
<b>Buses</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	3	0	0	3	-	0	0	0	0	0	-	3
<b>% Buses</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0.3%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0.2%
<b>Pedestrians</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
<b>% Pedestrians</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
<b>% Bicycles on Crosswalk</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**US-69 & SE 69th St - TMC**

Thu Mar 7, 2019

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

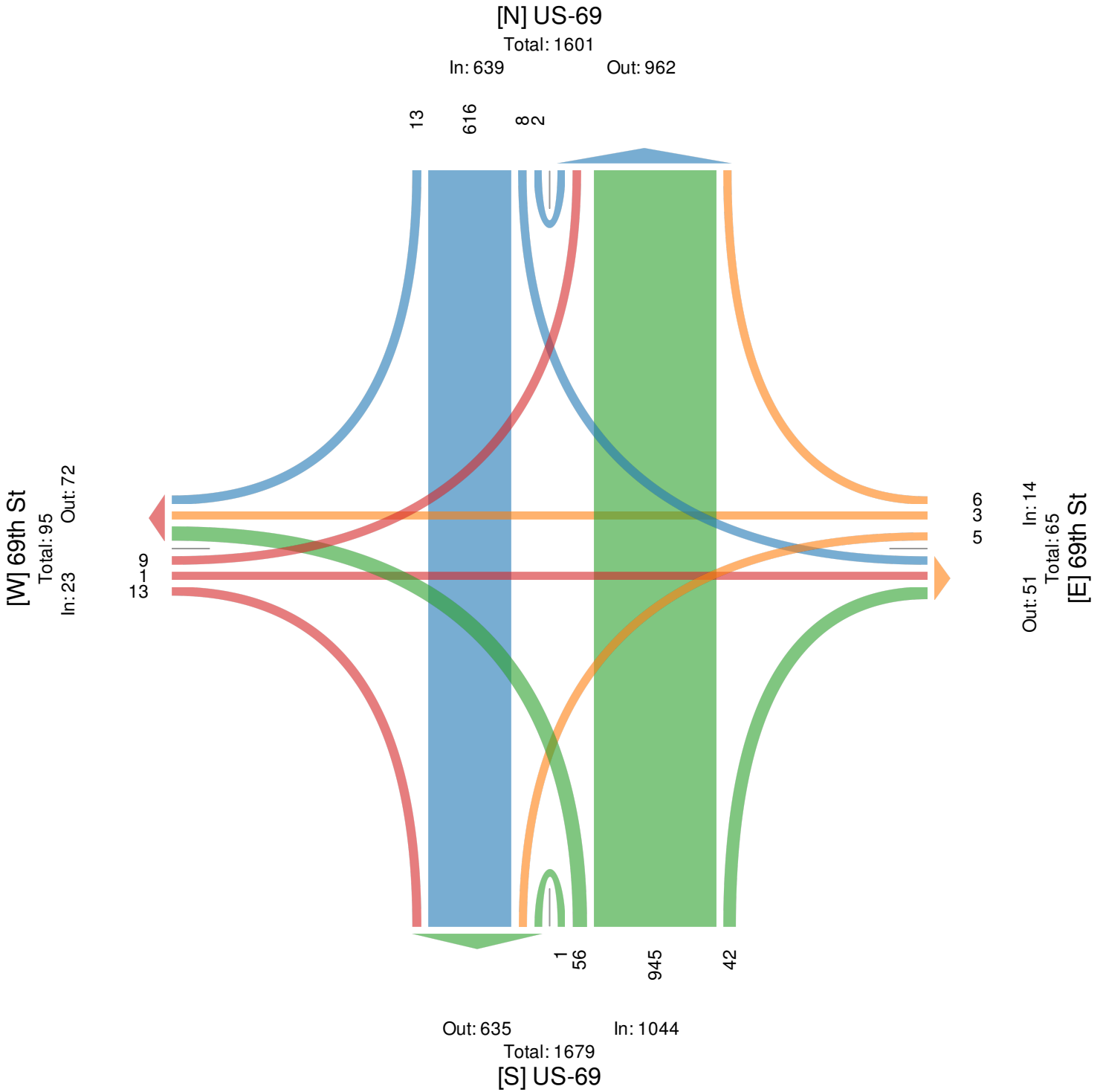
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627682, Location: 36.249334, -95.335894



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



**US-69 & US-69A - TMC**

Thu Mar 7, 2019

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627683, Location: 36.247639, -95.336128



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	US-69 Southbound					69A Westbound					US-69 Northbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
2019-03-07 7:00AM	84	26	0	110	0	36	27	0	63	0	33	72	0	105	0	278
7:15AM	100	34	0	134	0	47	28	0	75	0	38	108	0	146	0	355
7:30AM	110	50	0	160	0	35	31	0	66	0	44	86	0	130	0	356
7:45AM	107	46	0	153	0	35	28	0	63	0	61	139	0	200	0	416
Hourly Total	401	156	0	557	0	153	114	0	267	0	176	405	0	581	0	1405
8:00AM	82	30	0	112	0	26	21	0	47	0	39	90	0	129	0	288
8:15AM	103	24	0	127	0	26	21	0	47	0	27	119	0	146	0	320
8:30AM	99	28	0	127	0	17	22	0	39	0	17	115	0	132	0	298
8:45AM	95	18	0	113	0	23	13	0	36	0	23	115	0	138	0	287
Hourly Total	379	100	0	479	0	92	77	0	169	0	106	439	0	545	0	1193
4:00PM	159	22	0	181	0	93	37	0	130	0	12	154	2	168	0	479
4:15PM	138	9	0	147	0	58	41	0	99	0	15	165	0	180	0	426
4:30PM	142	27	0	169	0	96	46	0	142	0	9	163	0	172	0	483
4:45PM	138	16	0	154	0	72	45	0	117	0	12	147	1	160	0	431
Hourly Total	577	74	0	651	0	319	169	0	488	0	48	629	3	680	0	1819
5:00PM	123	23	0	146	0	131	68	0	199	0	21	158	0	179	0	524
5:15PM	139	29	0	168	0	127	78	0	205	0	22	155	0	177	0	550
5:30PM	124	16	0	140	0	132	80	0	212	0	27	139	0	166	0	518
5:45PM	133	16	0	149	0	33	31	0	64	0	17	100	0	117	0	330
Hourly Total	519	84	0	603	0	423	257	0	680	0	87	552	0	639	0	1922
<b>Total</b>	1876	414	0	2290	0	987	617	0	1604	0	417	2025	3	2445	0	6339
<b>% Approach</b>	81.9%	18.1%	0%	-	-	61.5%	38.5%	0%	-	-	17.1%	82.8%	0.1%	-	-	-
<b>% Total</b>	29.6%	6.5%	0%	36.1%	-	15.6%	9.7%	0%	25.3%	-	6.6%	31.9%	0%	38.6%	-	-
<b>Lights</b>	1398	367	0	1765	-	931	569	0	1500	-	390	1565	3	1958	-	5223
<b>% Lights</b>	74.5%	88.6%	0%	77.1%	-	94.3%	92.2%	0%	93.5%	-	93.5%	77.3%	100%	80.1%	-	82.4%
<b>Articulated Trucks and Single-Unit Trucks</b>	477	47	0	524	-	56	48	0	104	-	27	455	0	482	-	1110
<b>% Articulated Trucks and Single-Unit Trucks</b>	25.4%	11.4%	0%	22.9%	-	5.7%	7.8%	0%	6.5%	-	6.5%	22.5%	0%	19.7%	-	17.5%
<b>Buses</b>	1	0	0	1	-	0	0	0	0	-	0	5	0	5	-	6
<b>% Buses</b>	0.1%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0.2%	0%	0.2%	-	0.1%
<b>Pedestrians</b>	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0
<b>% Pedestrians</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0
<b>% Bicycles on Crosswalk</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**US-69 & US-69A - TMC**

Thu Mar 7, 2019

Full Length (7 AM-9 AM, 4 PM-6 PM)

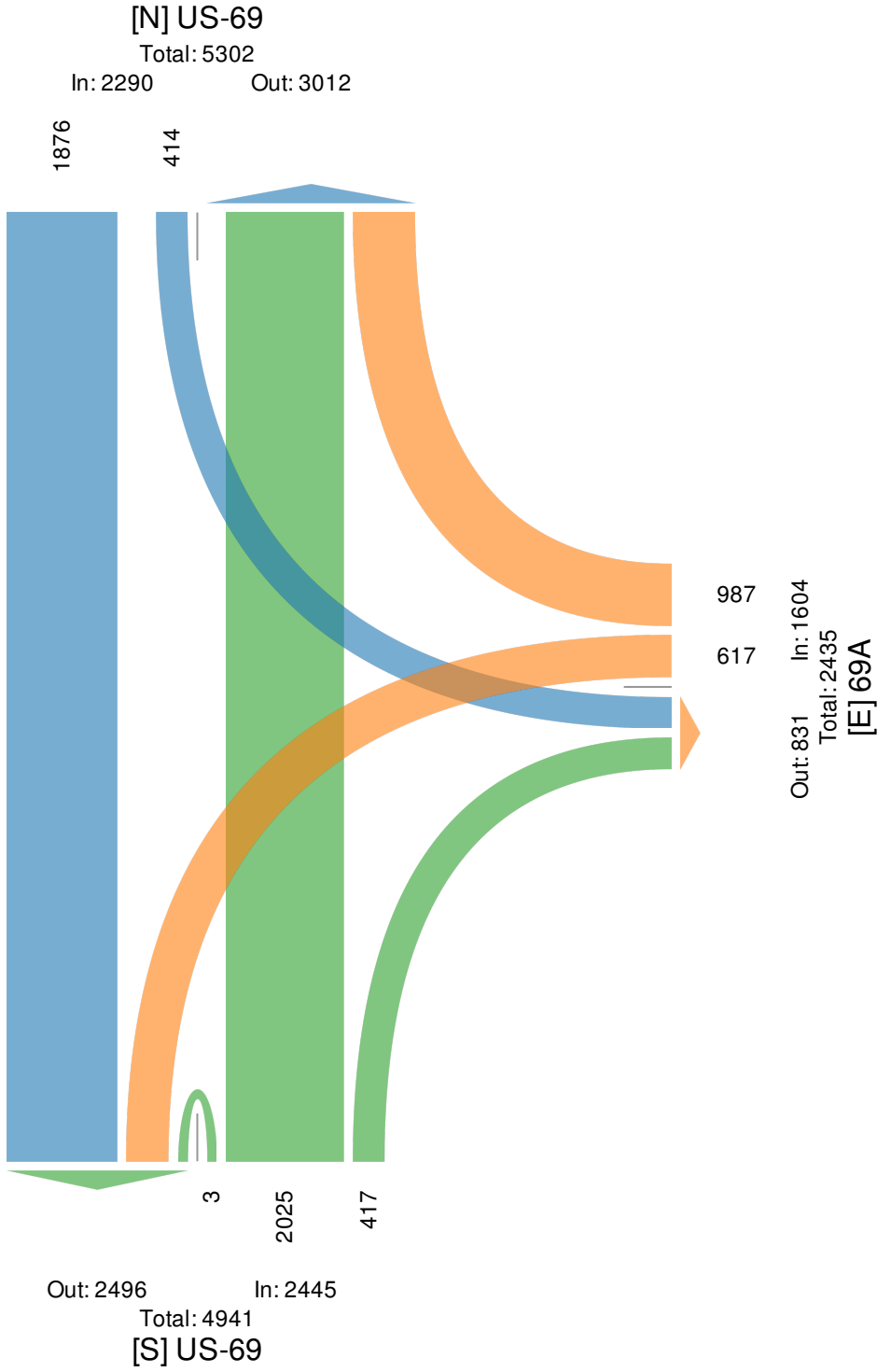
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627683, Location: 36.247639, -95.336128



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



**US-69 & US-69A - TMC**

Thu Mar 7, 2019

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627683, Location: 36.247639, -95.336128



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	US-69 Southbound					69A Westbound					US-69 Northbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
Time																
2019-03-07 7:15AM	100	34	0	134	0	47	28	0	75	0	38	108	0	146	0	355
7:30AM	110	50	0	160	0	35	31	0	66	0	44	86	0	130	0	356
7:45AM	107	46	0	153	0	35	28	0	63	0	61	139	0	200	0	416
8:00AM	82	30	0	112	0	26	21	0	47	0	39	90	0	129	0	288
<b>Total</b>	399	160	0	559	0	143	108	0	251	0	182	423	0	605	0	1415
<b>% Approach</b>	71.4%	28.6%	0%	-	-	57.0%	43.0%	0%	-	-	30.1%	69.9%	0%	-	-	-
<b>% Total</b>	28.2%	11.3%	0%	39.5%	-	10.1%	7.6%	0%	17.7%	-	12.9%	29.9%	0%	42.8%	-	-
<b>PHF</b>	0.907	0.800	-	0.873	-	0.761	0.871	-	0.837	-	0.746	0.761	-	0.756	-	0.850
<b>Lights</b>	297	142	0	439	-	135	101	0	236	-	172	316	0	488	-	1163
<b>% Lights</b>	74.4%	88.8%	0%	78.5%	-	94.4%	93.5%	0%	94.0%	-	94.5%	74.7%	0%	80.7%	-	82.2%
<b>Articulated Trucks and Single-Unit Trucks</b>	102	18	0	120	-	8	7	0	15	-	10	105	0	115	-	250
<b>% Articulated Trucks and Single-Unit Trucks</b>	25.6%	11.3%	0%	21.5%	-	5.6%	6.5%	0%	6.0%	-	5.5%	24.8%	0%	19.0%	-	17.7%
<b>Buses</b>	0	0	0	0	-	0	0	0	0	-	0	2	0	2	-	2
<b>% Buses</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0.5%	0%	0.3%	-	0.1%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**US-69 & US-69A - TMC**

Thu Mar 7, 2019

AM Peak (7:15 AM - 8:15 AM)

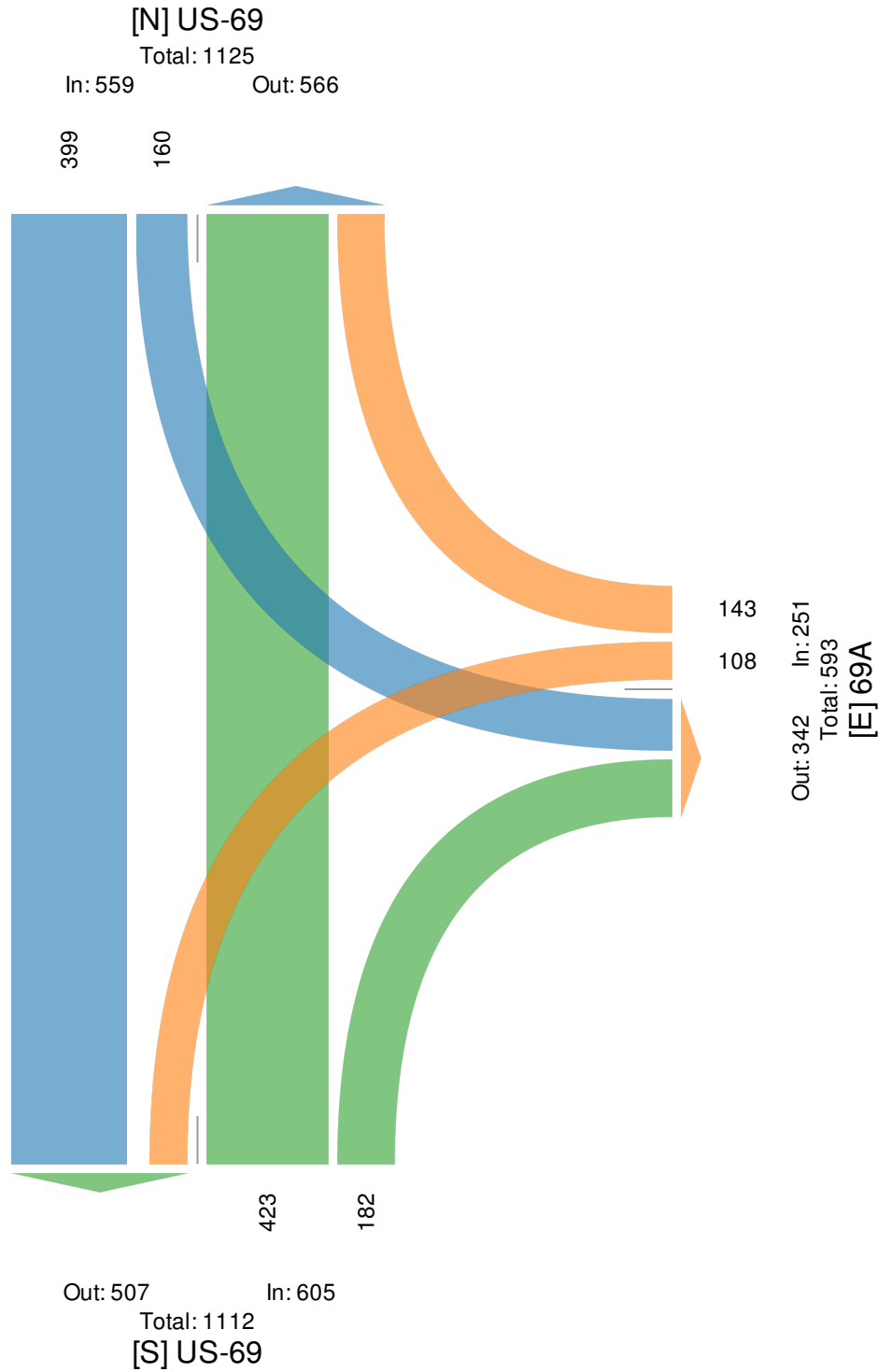
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627683, Location: 36.247639, -95.336128



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US





**US-69 & US-69A - TMC**

Thu Mar 7, 2019

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627683, Location: 36.247639, -95.336128



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	US-69 Southbound					69A Westbound					US-69 Northbound					Int
	T	L	U	App	Ped*	R	L	U	App	Ped*	R	T	U	App	Ped*	
Time																
2019-03-07 4:45PM	138	16	0	154	0	72	45	0	117	0	12	147	1	160	0	431
5:00PM	123	23	0	146	0	131	68	0	199	0	21	158	0	179	0	524
5:15PM	139	29	0	168	0	127	78	0	205	0	22	155	0	177	0	550
5:30PM	124	16	0	140	0	132	80	0	212	0	27	139	0	166	0	518
<b>Total</b>	524	84	0	608	0	462	271	0	733	0	82	599	1	682	0	2023
<b>% Approach</b>	86.2%	13.8%	0%	-	-	63.0%	37.0%	0%	-	-	12.0%	87.8%	0.1%	-	-	-
<b>% Total</b>	25.9%	4.2%	0%	30.1%	-	22.8%	13.4%	0%	36.2%	-	4.1%	29.6%	0%	33.7%	-	-
<b>PHF</b>	0.942	0.724	-	0.905	-	0.875	0.847	-	0.864	-	0.759	0.948	0.250	0.953	-	0.920
<b>Lights</b>	411	78	0	489	-	447	256	0	703	-	79	470	1	550	-	1742
<b>% Lights</b>	78.4%	92.9%	0%	80.4%	-	96.8%	94.5%	0%	95.9%	-	96.3%	78.5%	100%	80.6%	-	86.1%
<b>Articulated Trucks and Single-Unit Trucks</b>	113	6	0	119	-	15	15	0	30	-	3	128	0	131	-	280
<b>% Articulated Trucks and Single-Unit Trucks</b>	21.6%	7.1%	0%	19.6%	-	3.2%	5.5%	0%	4.1%	-	3.7%	21.4%	0%	19.2%	-	13.8%
<b>Buses</b>	0	0	0	0	-	0	0	0	0	-	0	1	0	1	-	1
<b>% Buses</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0.2%	0%	0.1%	-	0%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**US-69 & US-69A - TMC**

Thu Mar 7, 2019

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

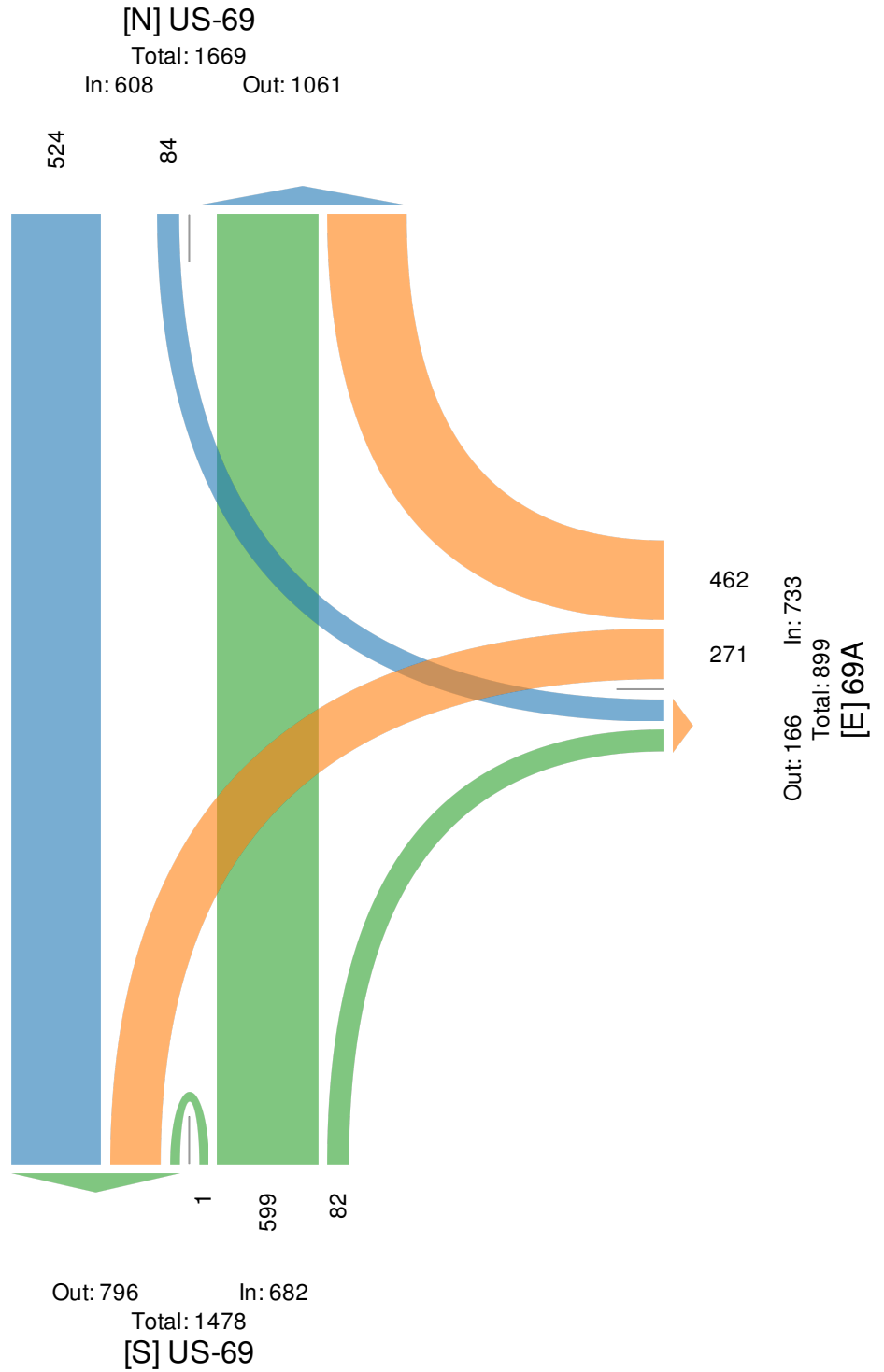
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627683, Location: 36.247639, -95.336128



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



**US-69A & Oakwood Dr - TMC**

Thu Mar 7, 2019

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627684, Location: 36.248703, -95.327629



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Oakwood Dr Southbound					US-69A Westbound					US-69A Eastbound					Int
	R	L	U	App	Ped*	R	T	U	App	Ped*	T	L	U	App	Ped*	
Time																
2019-03-07 7:00AM	3	14	0	17	0	3	75	0	78	0	54	0	0	54	0	149
7:15AM	1	9	0	10	0	9	88	0	97	0	66	0	0	66	0	173
7:30AM	4	12	0	16	0	6	79	0	85	0	94	0	0	94	0	195
7:45AM	2	8	0	10	0	6	71	0	77	0	101	1	0	102	0	189
Hourly Total	10	43	0	53	0	24	313	0	337	0	315	1	0	316	0	706
8:00AM	0	4	0	4	0	5	47	0	52	0	71	1	0	72	0	128
8:15AM	2	6	0	8	0	6	45	0	51	0	60	0	0	60	0	119
8:30AM	1	7	0	8	0	6	44	0	50	0	49	0	0	49	0	107
8:45AM	1	5	0	6	0	6	43	0	49	0	39	2	0	41	0	96
Hourly Total	4	22	0	26	0	23	179	0	202	0	219	3	0	222	0	450
4:00PM	0	13	0	13	0	16	104	0	120	0	63	5	0	68	0	201
4:15PM	6	12	0	18	0	14	73	0	87	0	35	2	0	37	0	142
4:30PM	0	13	0	13	0	16	129	0	145	0	38	1	0	39	0	197
4:45PM	1	11	0	12	0	12	105	0	117	0	31	1	0	32	0	161
Hourly Total	7	49	0	56	0	58	411	0	469	0	167	9	0	176	0	701
5:00PM	3	11	0	14	0	19	135	0	154	0	51	2	0	53	0	221
5:15PM	6	12	0	18	0	21	154	0	175	0	55	4	0	59	0	252
5:30PM	5	15	0	20	0	20	148	0	168	0	50	4	0	54	0	242
5:45PM	2	8	0	10	0	8	58	0	66	0	32	2	0	34	0	110
Hourly Total	16	46	0	62	0	68	495	0	563	0	188	12	0	200	0	825
<b>Total</b>	37	160	0	197	0	173	1398	0	1571	0	889	25	0	914	0	2682
<b>% Approach</b>	18.8%	81.2%	0%	-	-	11.0%	89.0%	0%	-	-	97.3%	2.7%	0%	-	-	-
<b>% Total</b>	1.4%	6.0%	0%	7.3%	-	6.5%	52.1%	0%	58.6%	-	33.1%	0.9%	0%	34.1%	-	-
<b>Lights</b>	36	154	0	190	-	171	1298	0	1469	-	812	25	0	837	-	2496
<b>% Lights</b>	97.3%	96.3%	0%	96.4%	-	98.8%	92.8%	0%	93.5%	-	91.3%	100%	0%	91.6%	-	93.1%
<b>Articulated Trucks and Single-Unit Trucks</b>	1	6	0	7	-	2	100	0	102	-	77	0	0	77	-	186
<b>% Articulated Trucks and Single-Unit Trucks</b>	2.7%	3.8%	0%	3.6%	-	1.2%	7.2%	0%	6.5%	-	8.7%	0%	0%	8.4%	-	6.9%
<b>Buses</b>	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
<b>% Buses</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
<b>% Pedestrians</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
<b>% Bicycles on Crosswalk</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**US-69A & Oakwood Dr - TMC**

Thu Mar 7, 2019

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627684, Location: 36.248703, -95.327629

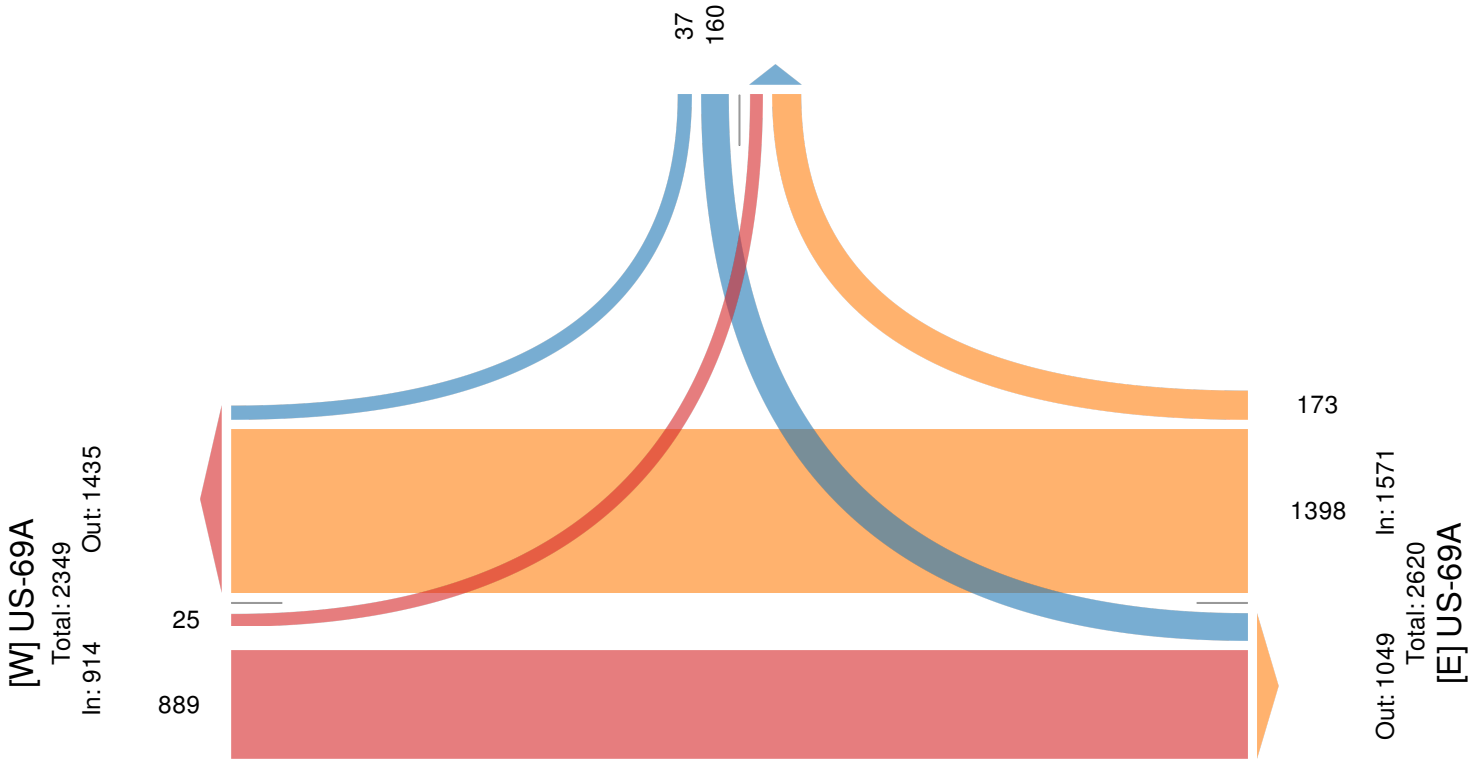


Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

**[N] Oakwood Dr**

Total: 395

In: 197 Out: 198



**US-69A & Oakwood Dr - TMC**

Thu Mar 7, 2019

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627684, Location: 36.248703, -95.327629



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Oakwood Dr Southbound					US-69A Westbound					US-69A Eastbound				Int
	R	L	U	App	Ped*	R	T	U	App	Ped*	T	L	U	App	
Time															
2019-03-07 7:00AM	3	14	0	17	0	3	75	0	78	0	54	0	0	54	0
7:15AM	1	9	0	10	0	9	88	0	97	0	66	0	0	66	0
7:30AM	4	12	0	16	0	6	79	0	85	0	94	0	0	94	0
7:45AM	2	8	0	10	0	6	71	0	77	0	101	1	0	102	0
<b>Total</b>	10	43	0	53	0	24	313	0	337	0	315	1	0	316	0
<b>% Approach</b>	18.9%	81.1%	0%	-	-	7.1%	92.9%	0%	-	-	99.7%	0.3%	0%	-	-
<b>% Total</b>	1.4%	6.1%	0%	7.5%	-	3.4%	44.3%	0%	47.7%	-	44.6%	0.1%	0%	44.8%	-
<b>PHF</b>	0.625	0.768	-	0.779	-	0.667	0.889	-	0.869	-	0.780	0.250	-	0.775	-
<b>Lights</b>	10	40	0	50	-	24	295	0	319	-	285	1	0	286	-
<b>% Lights</b>	100%	93.0%	0%	94.3%	-	100%	94.2%	0%	94.7%	-	90.5%	100%	0%	90.5%	-
<b>Articulated Trucks and Single-Unit Trucks</b>	0	3	0	3	-	0	18	0	18	-	30	0	0	30	-
<b>% Articulated Trucks and Single-Unit Trucks</b>	0%	7.0%	0%	5.7%	-	0%	5.8%	0%	5.3%	-	9.5%	0%	0%	9.5%	-
<b>Buses</b>	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-
<b>% Buses</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**US-69A & Oakwood Dr - TMC**

Thu Mar 7, 2019

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627684, Location: 36.248703, -95.327629



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

**[N] Oakwood Dr**

Total: 78

In: 53 Out: 25

10 43



**US-69A & Oakwood Dr - TMC**

Thu Mar 7, 2019

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627684, Location: 36.248703, -95.327629



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Oakwood Dr Southbound					US-69A Westbound					US-69A Eastbound					Int
	R	L	U	App	Ped*	R	T	U	App	Ped*	T	L	U	App	Ped*	
Time																
2019-03-07 4:45PM	1	11	0	12	0	12	105	0	117	0	31	1	0	32	0	161
5:00PM	3	11	0	14	0	19	135	0	154	0	51	2	0	53	0	221
5:15PM	6	12	0	18	0	21	154	0	175	0	55	4	0	59	0	252
5:30PM	5	15	0	20	0	20	148	0	168	0	50	4	0	54	0	242
<b>Total</b>	15	49	0	64	0	72	542	0	614	0	187	11	0	198	0	876
<b>% Approach</b>	23.4%	76.6%	0%	-	-	11.7%	88.3%	0%	-	-	94.4%	5.6%	0%	-	-	-
<b>% Total</b>	1.7%	5.6%	0%	7.3%	-	8.2%	61.9%	0%	70.1%	-	21.3%	1.3%	0%	22.6%	-	-
<b>PHF</b>	0.625	0.817	-	0.800	-	0.857	0.880	-	0.877	-	0.850	0.688	-	0.839	-	0.869
<b>Lights</b>	14	48	0	62	-	72	512	0	584	-	180	11	0	191	-	837
<b>% Lights</b>	93.3%	98.0%	0%	96.9%	-	100%	94.5%	0%	95.1%	-	96.3%	100%	0%	96.5%	-	95.5%
<b>Articulated Trucks and Single-Unit Trucks</b>	1	1	0	2	-	0	30	0	30	-	7	0	0	7	-	39
<b>% Articulated Trucks and Single-Unit Trucks</b>	6.7%	2.0%	0%	3.1%	-	0%	5.5%	0%	4.9%	-	3.7%	0%	0%	3.5%	-	4.5%
<b>Buses</b>	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
<b>% Buses</b>	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



**US-69A & Oakwood Dr - TMC**

Thu Mar 7, 2019

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627684, Location: 36.248703, -95.327629



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

**[N] Oakwood Dr**

Total: 147

In: 64 Out: 83

15  
49



**US-69A & Zarrow St / Elliott St - TMC**

Thu Mar 7, 2019

Full Length (7 AM-7 PM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627686, Location: 36.248706, -95.309926



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Elliott St Southbound					US-69A Westbound					Elliott St Northbound					US-69A Eastbound					Int						
	R	T	L	U	App Ped*	R	T	L	U	App Ped*	R	T	L	U	App Ped*	R	T	L	U	App Ped*							
2019-03-07 7:00AM	20	2	18	0	40	0	16	51	6	0	73	0	0	0	1	0	1	0	0	0	8	38	11	0	57	0	171
7:15AM	25	2	14	0	41	0	15	70	3	0	88	0	1	0	2	0	3	0	0	0	5	43	13	0	61	0	193
7:30AM	22	1	12	0	35	0	12	77	5	0	94	0	3	3	4	0	10	0	0	0	6	62	10	0	78	0	217
7:45AM	28	4	28	0	60	0	13	61	5	0	79	0	1	1	1	0	3	0	0	0	7	55	15	0	77	0	219
Hourly Total	95	9	72	0	176	0	56	259	19	0	334	0	5	4	8	0	17	0	0	0	26	198	49	0	273	0	800
8:00AM	20	1	20	0	41	0	18	38	6	0	62	0	2	0	0	0	2	0	0	0	4	39	12	0	55	0	160
8:15AM	24	2	14	0	40	0	10	29	5	0	44	0	5	1	0	0	6	0	0	0	3	49	12	0	64	0	154
8:30AM	11	1	14	0	26	0	9	41	1	0	51	0	3	0	1	0	4	0	0	0	3	46	4	0	53	0	134
8:45AM	9	0	10	0	19	0	13	43	1	0	57	0	4	1	2	0	7	0	0	0	1	34	9	0	44	0	127
Hourly Total	64	4	58	0	126	0	50	151	13	0	214	0	14	2	3	0	19	0	0	0	11	168	37	0	216	0	575
9:00AM	8	2	5	0	15	0	9	50	4	0	63	0	1	2	4	0	7	0	0	0	5	38	4	0	47	0	132
9:15AM	3	0	14	0	17	0	7	37	5	0	49	0	3	2	1	0	6	0	0	0	2	44	6	0	52	0	124
9:30AM	13	1	14	0	28	0	9	41	3	0	53	0	4	0	2	0	6	0	0	0	5	33	4	0	42	0	129
9:45AM	11	2	13	0	26	0	8	40	7	0	55	0	6	0	1	0	7	0	0	0	1	36	4	0	41	0	129
Hourly Total	35	5	46	0	86	0	33	168	19	0	220	0	14	4	8	0	26	0	0	0	13	151	18	0	182	0	514
10:00AM	13	0	10	0	23	0	12	36	3	0	51	0	4	0	6	0	10	0	0	0	3	32	4	0	39	0	123
10:15AM	7	0	8	0	15	0	5	32	3	0	40	0	3	1	1	0	5	0	0	0	0	41	9	0	50	0	110
10:30AM	6	1	10	0	17	0	9	33	5	0	47	0	3	0	3	0	6	0	0	0	4	27	13	0	44	0	114
10:45AM	6	3	7	0	16	0	15	50	4	0	69	0	1	0	1	0	2	0	0	0	3	40	4	0	47	0	134
Hourly Total	32	4	35	0	71	0	41	151	15	0	207	0	11	1	11	0	23	0	0	0	10	140	30	0	180	0	481
11:00AM	9	1	11	0	21	0	16	76	4	0	96	0	1	4	3	0	8	0	0	0	1	28	9	0	38	0	163
11:15AM	8	1	18	0	27	0	20	54	4	0	78	0	3	0	1	0	4	0	0	0	1	39	5	0	45	0	154
11:30AM	9	2	21	0	32	0	25	105	2	0	132	0	5	1	4	0	10	0	0	0	5	49	3	0	57	0	231
11:45AM	16	1	10	0	27	0	21	64	3	0	88	0	5	1	7	0	13	0	0	0	2	57	7	0	66	0	194
Hourly Total	42	5	60	0	107	0	82	299	13	0	394	0	14	6	15	0	35	0	0	0	9	173	24	0	206	0	742
12:00PM	27	2	25	0	54	0	19	63	2	0	84	0	7	5	14	0	26	0	0	0	5	65	17	0	87	0	251
12:15PM	8	3	19	0	30	0	9	46	1	0	56	0	3	2	7	0	12	0	0	0	8	64	7	0	79	0	177
12:30PM	17	2	21	0	40	0	11	46	3	0	60	0	3	1	1	0	5	0	0	0	5	53	7	0	65	0	170
12:45PM	21	4	20	0	45	0	11	37	4	0	52	0	2	1	2	0	5	0	0	0	8	48	10	0	66	0	168
Hourly Total	73	11	85	0	169	0	50	192	10	0	252	0	15	9	24	0	48	0	0	0	26	230	41	0	297	0	766
1:00PM	9	2	12	0	23	0	12	37	6	0	55	0	4	0	3	0	7	0	0	0	2	37	8	0	47	0	130
1:15PM	13	1	19	0	33	0	20	34	5	0	59	0	3	1	0	0	4	0	0	0	1	38	5	0	44	0	142
1:30PM	8	1	14	0	23	0	5	35	3	0	43	0	3	1	5	0	9	0	0	0	1	53	5	0	59	0	134
1:45PM	6	0	17	0	23	0	9	47	2	0	58	0	11	1	2	0	14	0	0	0	2	32	9	0	43	0	138
Hourly Total	36	4	62	0	102	0	46	153	16	0	215	0	21	3	10	0	34	0	0	0	6	160	27	0	193	0	544
2:00PM	7	1	7	0	15	0	6	42	8	0	56	0	2	0	5	0	7	0	0	0	2	52	11	0	65	0	143
2:15PM	7	1	10	0	18	0	12	41	7	0	60	0	6	3	2	0	11	0	0	0	3	48	8	0	59	0	148
2:30PM	2	0	13	0	15	0	27	67	5	0	99	0	13	7	15	0	35	0	0	0	2	48	10	0	60	0	209
2:45PM	12	0	13	0	25	0	21	55	3	0	79	0	3	1	0	0	4	0	0	0	2	33	11	0	46	0	154
Hourly Total	28	2	43	0	73	0	66	205	23	0	294	0	24	11	22	0	57	0	0	0	9	181	40	0	230	0	654
3:00PM	5	2	11	0	18	0	38	66	2	0	106	0	4	2	3	0	9	0	0	0	2	40	13	0	55	0	188
3:15PM	13	1	13	0	27	0	20	54	3	0	77	0	5	2	1	0	8	0	0	0	1	45	12	0	58	0	170
3:30PM	18	2	13	0	33	0	34	96	3	0	133	0	13	1	6	0	20	0	0	0	0	37	13	0	50	0	236
3:45PM	10	2	14	0	26	0	16	46	2	0	64	0	1	5	1	0	7	0	0	0	1	37	18	0	56	0	153
Hourly Total	46	7	51	0	104	0	108	262	10	0	380	0	23	10	11	0	44	0	0	0	4	159	56	0	219	0	747
4:00PM	14	1	9	0	24	0	35	66	2	0	103	0	5	4	10	0	19	0	0	0	4	66	31	0	101	0	247
4:15PM	12	0	14	0	26	0	16	59	2	0	77	0	8	0	2	0	10	0	0	0	5	37	15	0	57	0	170
4:30PM	4	3	9	0	16	0	55	102	2	0	159	0	18	8	11	0	37	0	0	0	1	45	10	0	56	0	268
4:45PM	12	2	12	0	26	0	24	52	1	0	77	0	16	4	7	0	27	0	0	0	0	40	13	0	53	0	183
Hourly Total	42	6	44	0	92	0	130	279	7	0	416	0	47	16	30	0	93	0	0	0	10	188	69	0	267	0	868
5:00PM	12	1	12	0	25	0	29	76	0	0	105	0	22	10	7	0	39	0	0	0	0	53	41	0	94	0	263
5:15PM	13	0	25	0	38	0	17	43	1	0	61	0	25	10	6	0	41	0	0	0	0	59	56	0	115	0	255
5:30PM	13	1	18	0	32	0	22	71	0	0	93	0	9	4	3	0	16	0	0	0	0	51	36	0	87	0	228
5:45PM	12	1	12																								

Leg Direction	Elliot St Southbound						US-69A Westbound						Elliot St Northbound						US-69A Eastbound						
Time	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	Int
<b>% Articulated Trucks and Single-Unit Trucks</b>	1.4%	6.3%	1.3%	0%	<b>1.6%</b>	-	1.0%	14.5%	26.2%	0%	<b>11.9%</b>	-	12.2%	2.2%	15.1%	0%	<b>11.4%</b>	-	20.5%	16.5%	1.7%	0%	<b>13.5%</b>	-	10.7%
<b>Buses</b>	0	0	2	0	<b>2</b>	-	2	3	0	0	<b>5</b>	-	0	0	0	0	<b>0</b>	-	0	0	0	0	<b>0</b>	-	7
<b>% Buses</b>	0%	0%	0.3%	0%	<b>0.2%</b>	-	0.3%	0.1%	0%	0%	<b>0.1%</b>	-	0%	0%	0%	0%	<b>0%</b>	-	0%	0%	0%	0%	<b>0%</b>	-	0.1%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**US-69A & Zarrow St / Elliott St - TMC**

Thu Mar 7, 2019

Full Length (7 AM-7 PM)

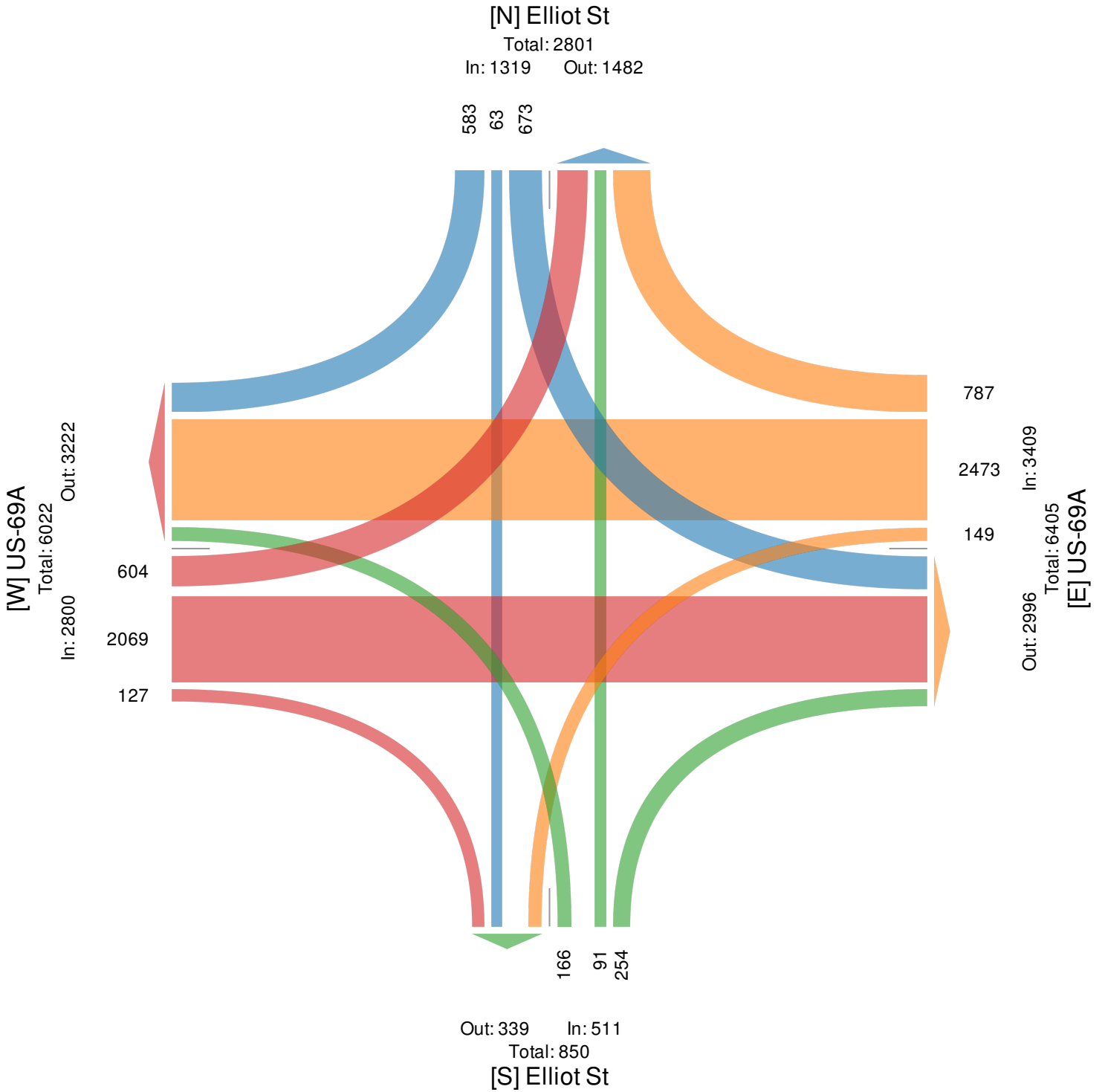
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627686, Location: 36.248706, -95.309926



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



**US-69A & Zarrow St / Elliott St - TMC**

Thu Mar 7, 2019

AM Peak (7 AM - 8 AM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627686, Location: 36.248706, -95.309926



Provided by: Gewalt Hamilton Associates Inc.

625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Elliott St Southbound						US-69A Westbound						Elliott St Northbound						US-69A Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2019-03-07 7:00AM	20	2	18	0	40	0	16	51	6	0	73	0	0	0	1	0	1	0	8	38	11	0	57	0	171
7:15AM	25	2	14	0	41	0	15	70	3	0	88	0	1	0	2	0	3	0	5	43	13	0	61	0	193
7:30AM	22	1	12	0	35	0	12	77	5	0	94	0	3	3	4	0	10	0	6	62	10	0	78	0	217
7:45AM	28	4	28	0	60	0	13	61	5	0	79	0	1	1	1	0	3	0	7	55	15	0	77	0	219
<b>Total</b>	95	9	72	0	176	0	56	259	19	0	334	0	5	4	8	0	17	0	26	198	49	0	273	0	800
<b>% Approach</b>	54.0%	5.1%	40.9%	0%	-	-	16.8%	77.5%	5.7%	0%	-	-	29.4%	23.5%	47.1%	0%	-	-	9.5%	72.5%	17.9%	0%	-	-	-
<b>% Total</b>	11.9%	1.1%	9.0%	0%	22.0%	-	7.0%	32.4%	2.4%	0%	41.8%	-	0.6%	0.5%	1.0%	0%	2.1%	-	3.3%	24.8%	6.1%	0%	34.1%	-	-
<b>PHF</b>	0.848	0.563	0.643	-	0.733	-	0.875	0.841	0.792	-	0.888	-	0.417	0.333	0.500	-	0.425	-	0.813	0.798	0.817	-	0.875	-	0.913
<b>Lights</b>	95	9	71	0	175	-	56	239	16	0	311	-	5	4	8	0	17	-	24	168	48	0	240	-	743
<b>% Lights</b>	100%	100%	98.6%	0%	99.4%	-	100%	92.3%	84.2%	0%	93.1%	-	100%	100%	100%	0%	100%	-	92.3%	84.8%	98.0%	0%	87.9%	-	92.9%
<b>Articulated Trucks and Single-Unit Trucks</b>	0	0	1	0	1	-	0	20	3	0	23	-	0	0	0	0	0	-	2	30	1	0	33	-	57
<b>% Articulated Trucks and Single-Unit Trucks</b>	0%	0%	1.4%	0%	0.6%	-	0%	7.7%	15.8%	0%	6.9%	-	0%	0%	0%	0%	0%	-	7.7%	15.2%	2.0%	0%	12.1%	-	7.1%
<b>Buses</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
<b>% Buses</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
<b>% Pedestrians</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
<b>% Bicycles on Crosswalk</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**US-69A & Zarrow St / Elliott St - TMC**

Thu Mar 7, 2019

AM Peak (7 AM - 8 AM)

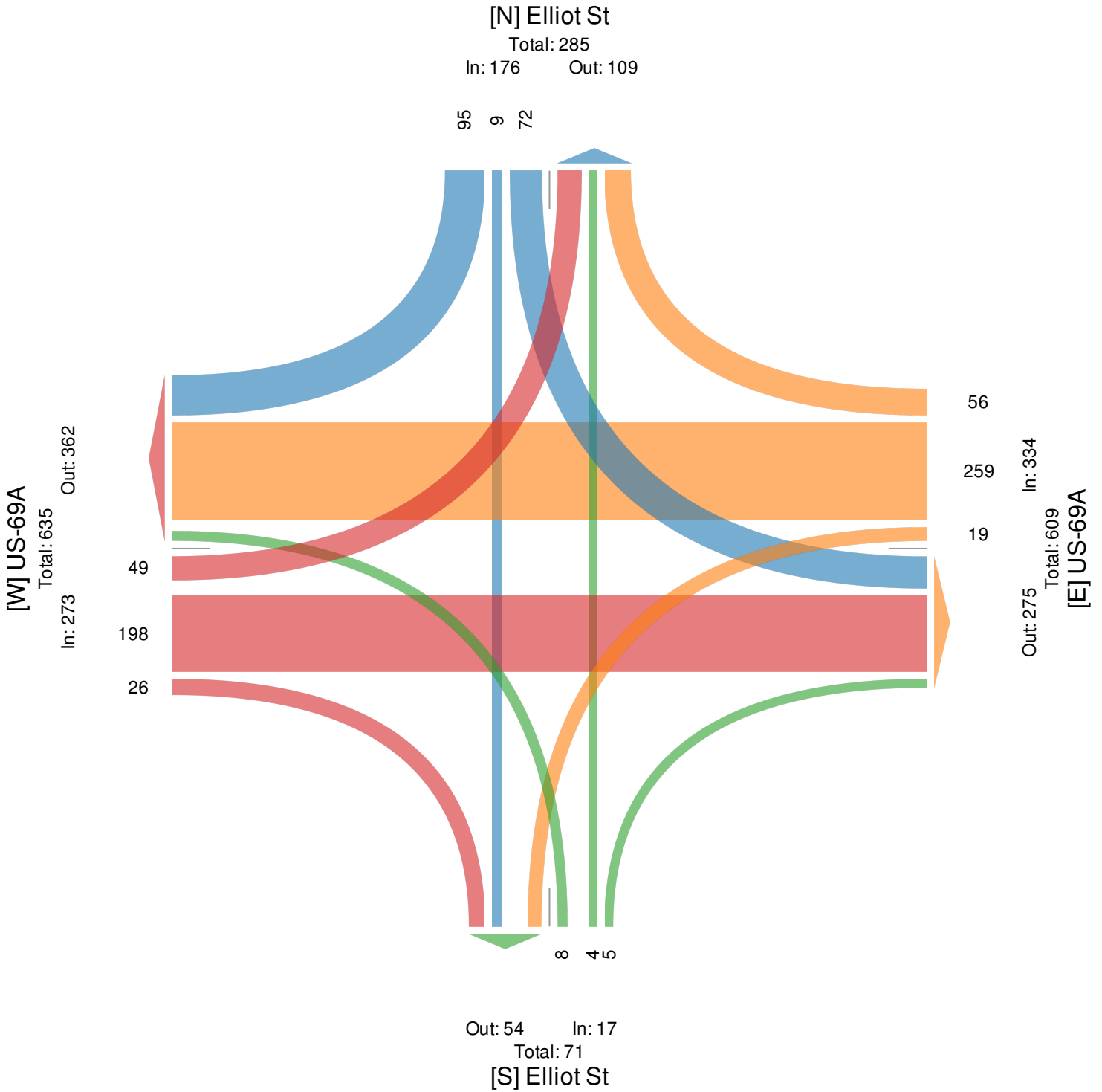
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627686, Location: 36.248706, -95.309926



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



**US-69A & Zarrow St / Elliott St - TMC**

Thu Mar 7, 2019

Midday Peak (11:30 AM - 12:30 PM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627686, Location: 36.248706, -95.309926



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Elliott St Southbound						US-69A Westbound						Elliott St Northbound						US-69A Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2019-03-07 11:30AM	9	2	21	0	32	0	25	105	2	0	132	0	5	1	4	0	10	0	5	49	3	0	57	0	231
11:45AM	16	1	10	0	27	0	21	64	3	0	88	0	5	1	7	0	13	0	2	57	7	0	66	0	194
12:00PM	27	2	25	0	54	0	19	63	2	0	84	0	7	5	14	0	26	0	5	65	17	0	87	0	251
12:15PM	8	3	19	0	30	0	9	46	1	0	56	0	3	2	7	0	12	0	8	64	7	0	79	0	177
<b>Total</b>	60	8	75	0	143	0	74	278	8	0	360	0	20	9	32	0	61	0	20	235	34	0	289	0	853
<b>% Approach</b>	42.0%	5.6%	52.4%	0%	-	-	20.6%	77.2%	2.2%	0%	-	-	32.8%	14.8%	52.5%	0%	-	-	6.9%	81.3%	11.8%	0%	-	-	-
<b>% Total</b>	7.0%	0.9%	8.8%	0%	16.8%	-	8.7%	32.6%	0.9%	0%	42.2%	-	2.3%	1.1%	3.8%	0%	7.2%	-	2.3%	27.5%	4.0%	0%	33.9%	-	-
<b>PHF</b>	0.556	0.667	0.750	-	0.662	-	0.740	0.662	0.667	-	0.682	-	0.714	0.450	0.571	-	0.587	-	0.625	0.904	0.500	-	0.830	-	0.850
<b>Lights</b>	59	8	75	0	142	-	74	237	7	0	318	-	17	9	30	0	56	-	17	197	33	0	247	-	763
<b>% Lights</b>	98.3%	100%	100%	0%	99.3%	-	100%	85.3%	87.5%	0%	88.3%	-	85.0%	100%	93.8%	0%	91.8%	-	85.0%	83.8%	97.1%	0%	85.5%	-	89.4%
<b>Articulated Trucks and Single-Unit Trucks</b>	1	0	0	0	1	-	0	41	1	0	42	-	3	0	2	0	5	-	3	38	1	0	42	-	90
<b>% Articulated Trucks and Single-Unit Trucks</b>	1.7%	0%	0%	0%	0.7%	-	0%	14.7%	12.5%	0%	11.7%	-	15.0%	0%	6.3%	0%	8.2%	-	15.0%	16.2%	2.9%	0%	14.5%	-	10.6%
<b>Buses</b>	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
<b>% Buses</b>	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
<b>Pedestrians</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
<b>% Pedestrians</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
<b>% Bicycles on Crosswalk</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**US-69A & Zarrow St / Elliott St - TMC**

Thu Mar 7, 2019

Midday Peak (11:30 AM - 12:30 PM)

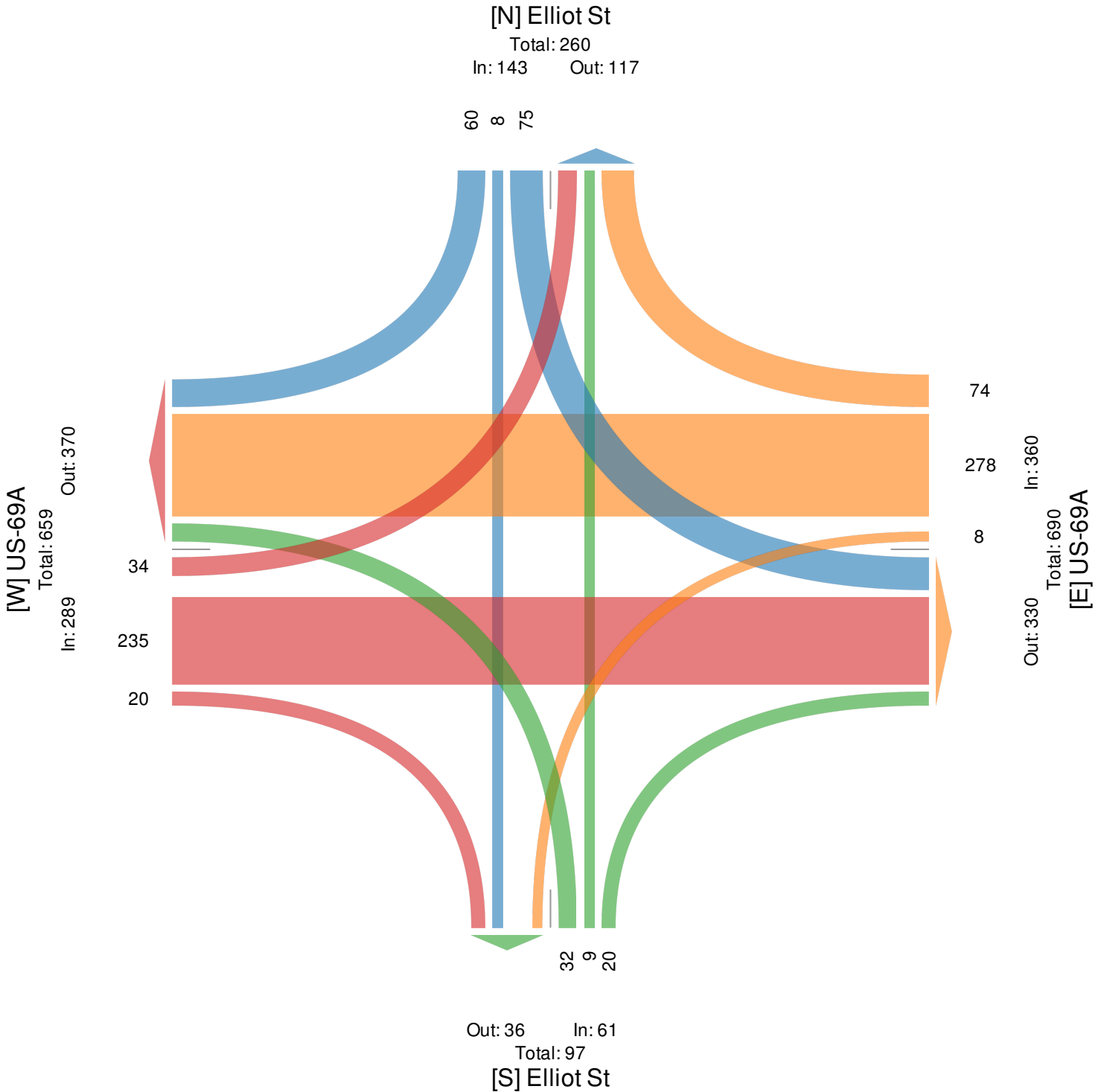
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627686, Location: 36.248706, -95.309926



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US





**US-69A & Zarrow St / Elliott St - TMC**

Thu Mar 7, 2019

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627686, Location: 36.248706, -95.309926



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Elliott St Southbound						US-69A Westbound						Elliott St Northbound						US-69A Eastbound						Int
	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	R	T	L	U	App	Ped*	
2019-03-07 4:30PM	4	3	9	0	16	0	55	102	2	0	159	0	18	8	11	0	37	0	1	45	10	0	56	0	268
4:45PM	12	2	12	0	26	0	24	52	1	0	77	0	16	4	7	0	27	0	0	40	13	0	53	0	183
5:00PM	12	1	12	0	25	0	29	76	0	0	105	0	22	10	7	0	39	0	0	53	41	0	94	0	263
5:15PM	13	0	25	0	38	0	17	43	1	0	61	0	25	10	6	0	41	0	0	59	56	0	115	0	255
<b>Total</b>	<b>41</b>	<b>6</b>	<b>58</b>	<b>0</b>	<b>105</b>	<b>0</b>	<b>125</b>	<b>273</b>	<b>4</b>	<b>0</b>	<b>402</b>	<b>0</b>	<b>81</b>	<b>32</b>	<b>31</b>	<b>0</b>	<b>144</b>	<b>0</b>	<b>1</b>	<b>197</b>	<b>120</b>	<b>0</b>	<b>318</b>	<b>0</b>	<b>969</b>
<b>% Approach</b>	39.0%	5.7%	55.2%	0%	-	-	31.1%	67.9%	1.0%	0%	-	-	56.3%	22.2%	21.5%	0%	-	-	0.3%	61.9%	37.7%	0%	-	-	-
<b>% Total</b>	4.2%	0.6%	6.0%	0%	10.8%	-	12.9%	28.2%	0.4%	0%	41.5%	-	8.4%	3.3%	3.2%	0%	14.9%	-	0.1%	20.3%	12.4%	0%	32.8%	-	-
<b>PHF</b>	0.788	0.500	0.580	-	0.691	-	0.568	0.669	0.500	-	0.632	-	0.810	0.800	0.705	-	0.878	-	0.250	0.835	0.536	-	0.691	-	0.904
<b>Lights</b>	40	6	58	0	104	-	124	251	4	0	379	-	77	32	31	0	140	-	1	180	120	0	301	-	924
<b>% Lights</b>	97.6%	100%	100%	0%	99.0%	-	99.2%	91.9%	100%	0%	94.3%	-	95.1%	100%	100%	0%	97.2%	-	100%	91.4%	100%	0%	94.7%	-	95.4%
<b>Articulated Trucks and Single-Unit Trucks</b>	1	0	0	0	1	-	0	22	0	0	22	-	4	0	0	0	4	-	0	17	0	0	17	-	44
<b>% Articulated Trucks and Single-Unit Trucks</b>	2.4%	0%	0%	0%	1.0%	-	0%	8.1%	0%	0%	5.5%	-	4.9%	0%	0%	0%	2.8%	-	0%	8.6%	0%	0%	5.3%	-	4.5%
<b>Buses</b>	0	0	0	0	0	-	1	0	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	1
<b>% Buses</b>	0%	0%	0%	0%	0%	-	0.8%	0%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.1%
<b>Pedestrians</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
<b>% Pedestrians</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bicycles on Crosswalk</b>	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
<b>% Bicycles on Crosswalk</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

**US-69A & Zarrow St / Elliott St - TMC**

Thu Mar 7, 2019

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

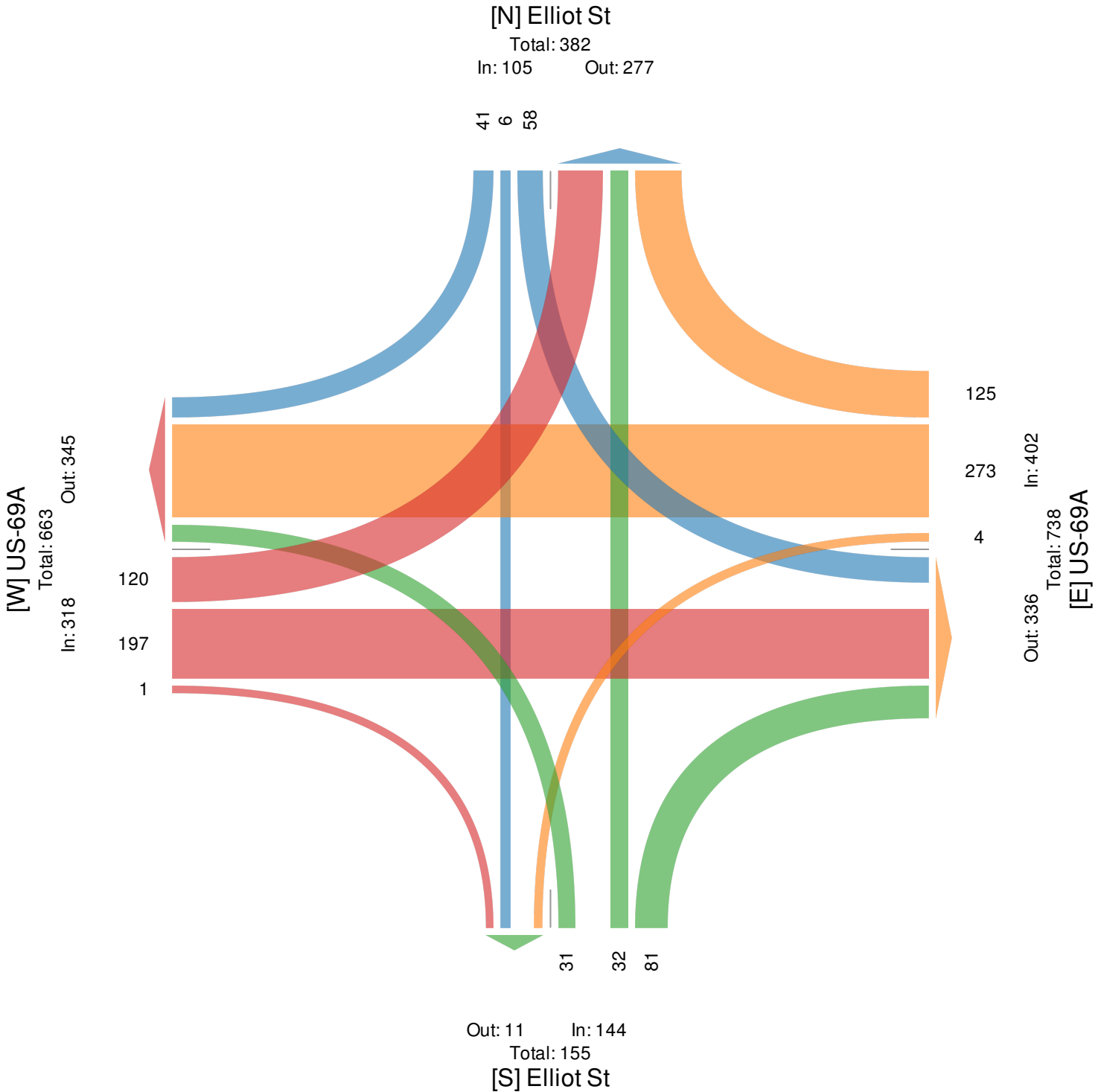
All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 627686, Location: 36.248706, -95.309926



Provided by: Gewalt Hamilton Associates Inc.  
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



## **APPENDIX B**

Base Conditions Capacity Analysis Reports

# HCM 6th Signalized Intersection Summary

## 1: US-69 & SH-69A

01/28/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	110	145	440	200	180	420
Future Volume (veh/h)	110	145	440	200	180	420
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	1811	1811	1530	1811	1737	1515
Adj Flow Rate, veh/h	129	171	518	235	212	494
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	6	6	25	6	11	26
Cap, veh/h	270	240	1205	637	261	1908
Arrive On Green	0.16	0.16	0.41	0.41	0.16	0.66
Sat Flow, veh/h	1725	1535	2983	1535	1654	2954
Grp Volume(v), veh/h	129	171	518	235	212	494
Grp Sat Flow(s),veh/h/ln	1725	1535	1453	1535	1654	1439
Q Serve(g_s), s	3.4	5.3	6.3	5.3	6.2	3.5
Cycle Q Clear(g_c), s	3.4	5.3	6.3	5.3	6.2	3.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	270	240	1205	637	261	1908
V/C Ratio(X)	0.48	0.71	0.43	0.37	0.81	0.26
Avail Cap(c_a), veh/h	624	555	1205	637	349	1908
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	19.1	19.9	10.4	10.1	20.3	3.4
Incr Delay (d2), s/veh	1.3	3.9	1.1	1.6	10.3	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	1.2	1.7	1.5	1.4	2.6	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.5	23.8	11.5	11.7	30.5	3.7
LnGrp LOS	C	C	B	B	C	A
Approach Vol, veh/h	300		753			706
Approach Delay, s/veh	22.4		11.6			11.8
Approach LOS	C		B			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	12.3	25.2			37.5	12.3
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	10.5	18.0			33.0	18.0
Max Q Clear Time (g_c+I1), s	8.2	8.3			5.5	7.3
Green Ext Time (p_c), s	0.1	2.7			3.0	0.6
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			13.5			
HCM 6th LOS			B			

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	5	1	10	16	5	1	25	1	5	49	10
Future Vol, veh/h	13	5	1	10	16	5	1	25	1	5	49	10
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	15	6	1	12	19	6	1	29	1	6	58	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.3	7.2	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	68%	32%	8%
Vol Thru, %	93%	26%	52%	77%
Vol Right, %	4%	5%	16%	16%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	27	19	31	64
LT Vol	1	13	10	5
Through Vol	25	5	16	49
RT Vol	1	1	5	10
Lane Flow Rate	32	22	36	75
Geometry Grp	1	1	1	1
Degree of Util (X)	0.036	0.026	0.041	0.083
Departure Headway (Hd)	4.044	4.218	4.07	3.947
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	881	843	874	905
Service Time	2.087	2.273	2.122	1.983
HCM Lane V/C Ratio	0.036	0.026	0.041	0.083
HCM Control Delay	7.2	7.4	7.3	7.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0.1	0.3

HCM 6th TWSC  
4: US-69 & SE 69th St

01/28/2020

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	19	3	40	15	2	10	15	559	11	5	545	6
Future Vol, veh/h	19	3	40	15	2	10	15	559	11	5	545	6
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	-	-	-	-	-	-	100	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	0	3	20	0	0	15	20	18	0	22	0
Mvmt Flow	20	3	42	16	2	11	16	588	12	5	574	6

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	914	1219	290	925	1216	300	580	0	0	600	0	0
Stage 1	587	587	-	626	626	-	-	-	-	-	-	-
Stage 2	327	632	-	299	590	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.5	6.96	7.9	6.5	6.9	4.4	-	-	4.1	-	-
Critical Hdwy Stg 1	6.6	5.5	-	6.9	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.5	-	6.9	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4	3.33	3.7	4	3.3	2.35	-	-	2.2	-	-
Pot Cap-1 Maneuver	223	182	704	198	183	702	906	-	-	987	-	-
Stage 1	455	500	-	397	480	-	-	-	-	-	-	-
Stage 2	651	477	-	637	498	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	214	178	704	180	179	702	906	-	-	987	-	-
Mov Cap-2 Maneuver	214	178	-	180	179	-	-	-	-	-	-	-
Stage 1	447	498	-	390	471	-	-	-	-	-	-	-
Stage 2	627	468	-	592	496	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	16.4		21.4		0.2		0.1	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	906	-	-	382	248	987	-
HCM Lane V/C Ratio	0.017	-	-	0.171	0.115	0.005	-
HCM Control Delay (s)	9	-	-	16.4	21.4	8.7	-
HCM Lane LOS	A	-	-	C	C	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.4	0	-

Intersection						
Int Delay, s/veh	2.9					
Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations	T		T		T	
Traffic Vol, veh/h	30	30	305	50	130	200
Future Vol, veh/h	30	30	305	50	130	200
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	8	2	2	6
Mvmt Flow	35	35	359	59	153	235

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	813	209	0	0	418
Stage 1	389	-	-	-	-
Stage 2	424	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	316	797	-	-	1138
Stage 1	654	-	-	-	-
Stage 2	628	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	267	797	-	-	1138
Mov Cap-2 Maneuver	267	-	-	-	-
Stage 1	553	-	-	-	-
Stage 2	628	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	15.9	0	3.6
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	400	1138	-
HCM Lane V/C Ratio	-	-	0.176	0.134	-
HCM Control Delay (s)	-	-	15.9	8.7	0.3
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.5	-

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	330	315	24	45	15
Future Vol, veh/h	3	330	315	24	45	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	10	6	0	7	0
Mvmt Flow	4	388	371	28	53	18

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	399	0	-	0	587 200
Stage 1	-	-	-	-	385 -
Stage 2	-	-	-	-	202 -
Critical Hdwy	4.1	-	-	-	6.94 6.9
Critical Hdwy Stg 1	-	-	-	-	5.94 -
Critical Hdwy Stg 2	-	-	-	-	5.94 -
Follow-up Hdwy	2.2	-	-	-	3.57 3.3
Pot Cap-1 Maneuver	1171	-	-	-	429 814
Stage 1	-	-	-	-	643 -
Stage 2	-	-	-	-	797 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1171	-	-	-	428 814
Mov Cap-2 Maneuver	-	-	-	-	514 -
Stage 1	-	-	-	-	641 -
Stage 2	-	-	-	-	797 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1171	-	-	-	566
HCM Lane V/C Ratio	0.003	-	-	-	0.125
HCM Control Delay (s)	8.1	-	-	-	12.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4



Intersection						
Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↘	
Traffic Vol, veh/h	245	130	74	309	30	30
Future Vol, veh/h	245	130	74	309	30	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	8	2	2	6	2	2
Mvmt Flow	288	153	87	364	35	35

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	441	0	721
Stage 1	-	-	-	-	365
Stage 2	-	-	-	-	356
Critical Hdwy	-	-	4.14	-	6.84
Critical Hdwy Stg 1	-	-	-	-	5.84
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	-	-	2.22	-	3.52
Pot Cap-1 Maneuver	-	-	1115	-	362
Stage 1	-	-	-	-	673
Stage 2	-	-	-	-	680
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1115	-	334
Mov Cap-2 Maneuver	-	-	-	-	429
Stage 1	-	-	-	-	621
Stage 2	-	-	-	-	680

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	554	-	-	1115	-
HCM Lane V/C Ratio	0.127	-	-	0.078	-
HCM Control Delay (s)	12.4	-	-	8.5	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.3	-

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↕↗		↵	↕↗			↕↗			↕	↗
Traffic Vol, veh/h	50	200	30	20	255	60	3	4	5	75	10	95
Future Vol, veh/h	50	200	30	20	255	60	3	4	5	75	10	95
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	15	8	16	8	0	0	0	0	1	0	0
Mvmt Flow	56	222	33	22	283	67	3	4	6	83	11	106

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	350	0	0	255	0	0	542	745	128	586	728	175
Stage 1	-	-	-	-	-	-	351	351	-	361	361	-
Stage 2	-	-	-	-	-	-	191	394	-	225	367	-
Critical Hdwy	4.14	-	-	4.42	-	-	7.5	6.5	6.9	7.52	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.52	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.52	5.5	-
Follow-up Hdwy	2.22	-	-	2.36	-	-	3.5	4	3.3	3.51	4	3.3
Pot Cap-1 Maneuver	1206	-	-	1211	-	-	428	345	905	396	353	844
Stage 1	-	-	-	-	-	-	644	636	-	633	629	-
Stage 2	-	-	-	-	-	-	798	609	-	760	626	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1206	-	-	1211	-	-	347	323	905	371	331	844
Mov Cap-2 Maneuver	-	-	-	-	-	-	347	323	-	371	331	-
Stage 1	-	-	-	-	-	-	614	607	-	604	618	-
Stage 2	-	-	-	-	-	-	673	598	-	715	597	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.5			0.5			13.2			13.8		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	452	1206	-	-	1211	-	-	366	844
HCM Lane V/C Ratio	0.029	0.046	-	-	0.018	-	-	0.258	0.125
HCM Control Delay (s)	13.2	8.1	-	-	8	-	-	18.2	9.9
HCM Lane LOS	B	A	-	-	A	-	-	C	A
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0.1	-	-	1	0.4

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	0	9	4	9	1	4	106	4	7	167	5
Future Vol, veh/h	6	0	9	4	9	1	4	106	4	7	167	5
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	80	80
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	1	0
Mvmt Flow	7	0	10	4	10	1	4	118	4	8	209	6

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	362	358	212	361	359	120	215	0	0	122	0	0
Stage 1	228	228	-	128	128	-	-	-	-	-	-	-
Stage 2	134	130	-	233	231	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	598	572	833	598	571	937	1367	-	-	1478	-	-
Stage 1	779	719	-	881	794	-	-	-	-	-	-	-
Stage 2	874	792	-	775	717	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	585	567	833	587	566	937	1367	-	-	1478	-	-
Mov Cap-2 Maneuver	585	567	-	587	566	-	-	-	-	-	-	-
Stage 1	777	715	-	878	792	-	-	-	-	-	-	-
Stage 2	859	790	-	761	713	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.2		11.3		0.3		0.3	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1367	-	-	712	589	1478	-
HCM Lane V/C Ratio	0.003	-	-	0.023	0.026	0.005	-
HCM Control Delay (s)	7.6	0	-	10.2	11.3	7.4	0
HCM Lane LOS	A	A	-	B	B	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-

# HCM 6th Signalized Intersection Summary

## 1: US-69 & SH-69A

01/28/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	275	450	610	85	110	530
Future Volume (veh/h)	275	450	610	85	110	530
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	1811	1856	1589	1841	1796	1574
Adj Flow Rate, veh/h	289	474	642	89	116	558
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	6	3	21	4	7	22
Cap, veh/h	517	472	1174	607	147	1645
Arrive On Green	0.30	0.30	0.39	0.39	0.09	0.55
Sat Flow, veh/h	1725	1572	3098	1560	1711	3069
Grp Volume(v), veh/h	289	474	642	89	116	558
Grp Sat Flow(s),veh/h/ln	1725	1572	1509	1560	1711	1495
Q Serve(g_s), s	8.5	18.0	9.9	2.2	4.0	6.2
Cycle Q Clear(g_c), s	8.5	18.0	9.9	2.2	4.0	6.2
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	517	472	1174	607	147	1645
V/C Ratio(X)	0.56	1.00	0.55	0.15	0.79	0.34
Avail Cap(c_a), veh/h	517	472	1174	607	245	1645
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	17.7	21.0	14.2	11.9	26.9	7.5
Incr Delay (d2), s/veh	1.3	42.6	1.8	0.5	8.9	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	10.7	2.8	0.7	1.8	1.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.0	63.6	16.1	12.4	35.8	8.0
LnGrp LOS	B	F	B	B	D	A
Approach Vol, veh/h	763		731			674
Approach Delay, s/veh	46.7		15.6			12.8
Approach LOS	D		B			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.7	27.8			37.5	22.5
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	8.6	19.9			33.0	18.0
Max Q Clear Time (g_c+I1), s	6.0	11.9			8.2	20.0
Green Ext Time (p_c), s	0.1	2.5			3.3	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			25.7			
HCM 6th LOS			C			

Intersection

Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	50	5	1	10	16	5	1	80	2	5	53	1
Future Vol, veh/h	50	5	1	10	16	5	1	80	2	5	53	1
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	59	6	1	12	19	6	1	94	2	6	62	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.9	7.5	7.7	7.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %		1%	89%	32%
Vol Thru, %		96%	9%	52%
Vol Right, %		2%	2%	16%
Sign Control		Stop	Stop	Stop
Traffic Vol by Lane		83	56	31
LT Vol		1	50	10
Through Vol		80	5	16
RT Vol		2	1	5
Lane Flow Rate		98	66	36
Geometry Grp		1	1	1
Degree of Util (X)		0.112	0.08	0.044
Departure Headway (Hd)		4.119	4.386	4.312
Convergence, Y/N		Yes	Yes	Yes
Cap		858	804	836
Service Time		2.2	2.479	2.312
HCM Lane V/C Ratio		0.114	0.082	0.043
HCM Control Delay		7.7	7.9	7.5
HCM Lane LOS		A	A	A
HCM 95th-tile Q		0.4	0.3	0.1

HCM 6th TWSC  
4: US-69 & SE 69th St

01/28/2020

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	10	1	15	5	3	10	60	955	45	10	620	15
Future Vol, veh/h	10	1	15	5	3	10	60	955	45	10	620	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	15	0	0	0	0	17	5	0	20	0
Mvmt Flow	11	1	16	5	3	11	63	1005	47	11	653	16

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1313	1861	335	1504	1846	526	669	0	0	1052	0	0
Stage 1	683	683	-	1155	1155	-	-	-	-	-	-	-
Stage 2	630	1178	-	349	691	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	7.2	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.45	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	118	74	624	85	76	502	931	-	-	669	-	-
Stage 1	410	452	-	213	274	-	-	-	-	-	-	-
Stage 2	441	267	-	646	449	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	105	68	624	77	70	502	931	-	-	669	-	-
Mov Cap-2 Maneuver	105	68	-	77	70	-	-	-	-	-	-	-
Stage 1	382	445	-	199	255	-	-	-	-	-	-	-
Stage 2	398	249	-	618	442	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	26.6		34.5		0.5		0.2	
HCM LOS	D		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	931	-	-	194	141	669	-	-
HCM Lane V/C Ratio	0.068	-	-	0.141	0.134	0.016	-	-
HCM Control Delay (s)	9.1	-	-	26.6	34.5	10.5	-	-
HCM Lane LOS	A	-	-	D	D	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	0.5	0	-	-

Intersection						
Int Delay, s/veh	3.2					
Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	140	30	190	2	5	560
Future Vol, veh/h	140	30	190	2	5	560
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	6	2	2	4
Mvmt Flow	165	35	224	2	6	659

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	567	113	0	0	226	0
Stage 1	225	-	-	-	-	-
Stage 2	342	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	454	918	-	-	1340	-
Stage 1	791	-	-	-	-	-
Stage 2	691	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	451	918	-	-	1340	-
Mov Cap-2 Maneuver	451	-	-	-	-	-
Stage 1	785	-	-	-	-	-
Stage 2	691	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	17.1	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	495	1340	-
HCM Lane V/C Ratio	-	-	0.404	0.004	-
HCM Control Delay (s)	-	-	17.1	7.7	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.9	0	-

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	11	210	550	72	49	15
Future Vol, veh/h	11	210	550	72	49	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	4	6	0	2	7
Mvmt Flow	13	247	647	85	58	18

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	732	0	-	0	840 366
Stage 1	-	-	-	-	690 -
Stage 2	-	-	-	-	150 -
Critical Hdwy	4.1	-	-	-	6.84 7.04
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.2	-	-	-	3.52 3.37
Pot Cap-1 Maneuver	882	-	-	-	304 617
Stage 1	-	-	-	-	459 -
Stage 2	-	-	-	-	862 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	882	-	-	-	299 617
Mov Cap-2 Maneuver	-	-	-	-	382 -
Stage 1	-	-	-	-	452 -
Stage 2	-	-	-	-	862 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	15.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	882	-	-	-	419
HCM Lane V/C Ratio	0.015	-	-	-	0.18
HCM Control Delay (s)	9.1	-	-	-	15.5
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.6



Intersection						
Int Delay, s/veh	6.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↗	
Traffic Vol, veh/h	230	29	10	373	249	70
Future Vol, veh/h	230	29	10	373	249	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	6	2	2	4	2	2
Mvmt Flow	271	34	12	439	293	82
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	305	0	532	153
Stage 1	-	-	-	-	288	-
Stage 2	-	-	-	-	244	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1253	-	477	866
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	774	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1253	-	472	866
Mov Cap-2 Maneuver	-	-	-	-	555	-
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	774	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.2	20.4			
HCM LOS			C			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	602	-	-	1253	-	
HCM Lane V/C Ratio	0.623	-	-	0.009	-	
HCM Control Delay (s)	20.4	-	-	7.9	-	
HCM Lane LOS	C	-	-	A	-	
HCM 95th %tile Q(veh)	4.3	-	-	0	-	

Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕			↕			↕	↗
Traffic Vol, veh/h	120	197	1	4	280	125	31	32	81	58	6	42
Future Vol, veh/h	120	197	1	4	280	125	31	32	81	58	6	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	9	0	0	8	0	0	0	5	0	0	2
Mvmt Flow	133	219	1	4	311	139	34	36	90	64	7	47

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	450	0	0	220	0	0	653	944	110	783	875	225
Stage 1	-	-	-	-	-	-	486	486	-	389	389	-
Stage 2	-	-	-	-	-	-	167	458	-	394	486	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	7	7.5	6.5	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.35	3.5	4	3.32
Pot Cap-1 Maneuver	1121	-	-	1361	-	-	356	264	913	288	290	778
Stage 1	-	-	-	-	-	-	537	554	-	612	612	-
Stage 2	-	-	-	-	-	-	824	570	-	608	554	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1121	-	-	1361	-	-	298	232	913	208	255	778
Mov Cap-2 Maneuver	-	-	-	-	-	-	298	232	-	208	255	-
Stage 1	-	-	-	-	-	-	473	488	-	539	610	-
Stage 2	-	-	-	-	-	-	764	568	-	448	488	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	3.3			0.1			18			22.2		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	435	1121	-	-	1361	-	-	212	778
HCM Lane V/C Ratio	0.368	0.119	-	-	0.003	-	-	0.335	0.06
HCM Control Delay (s)	18	8.6	-	-	7.7	-	-	30.3	9.9
HCM Lane LOS	C	A	-	-	A	-	-	D	A
HCM 95th %tile Q(veh)	1.7	0.4	-	-	0	-	-	1.4	0.2

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	2	6	7	5	5	9	265	3	7	93	4
Future Vol, veh/h	7	2	6	7	5	5	9	265	3	7	93	4
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	14	0	0	0	0	0	0	0	0
Mvmt Flow	8	2	7	8	6	6	10	294	3	8	103	4

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	443	438	105	442	439	296	107	0	0	297	0	0
Stage 1	121	121	-	316	316	-	-	-	-	-	-	-
Stage 2	322	317	-	126	123	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.24	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.24	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.24	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.626	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	528	515	955	506	515	748	1497	-	-	1276	-	-
Stage 1	888	800	-	670	659	-	-	-	-	-	-	-
Stage 2	694	658	-	850	798	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	514	507	955	495	507	748	1497	-	-	1276	-	-
Mov Cap-2 Maneuver	514	507	-	495	507	-	-	-	-	-	-	-
Stage 1	881	794	-	665	654	-	-	-	-	-	-	-
Stage 2	678	653	-	836	792	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.9		11.7		0.2		0.5	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1497	-	-	629	554	1276	-	-
HCM Lane V/C Ratio	0.007	-	-	0.026	0.034	0.006	-	-
HCM Control Delay (s)	7.4	0	-	10.9	11.7	7.8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

# HCM 6th Signalized Intersection Summary

## 1: US-69 & SH-69A

01/28/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	111	144	440	200	180	420
Future Volume (veh/h)	111	144	440	200	180	420
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	1811	1811	1530	1811	1737	1515
Adj Flow Rate, veh/h	156	231	706	325	274	563
Peak Hour Factor	0.87	0.76	0.76	0.75	0.80	0.91
Percent Heavy Veh, %	6	6	25	6	11	26
Cap, veh/h	321	286	1001	528	427	1937
Arrive On Green	0.19	0.19	0.34	0.34	0.26	0.67
Sat Flow, veh/h	1725	1535	2983	1535	1654	2954
Grp Volume(v), veh/h	156	231	706	325	274	563
Grp Sat Flow(s),veh/h/ln	1725	1535	1453	1535	1654	1439
Q Serve(g_s), s	5.2	9.2	13.4	11.3	9.4	5.1
Cycle Q Clear(g_c), s	5.2	9.2	13.4	11.3	9.4	5.1
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	321	286	1001	528	427	1937
V/C Ratio(X)	0.49	0.81	0.71	0.61	0.64	0.29
Avail Cap(c_a), veh/h	486	432	1001	528	427	1937
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.3	24.9	18.1	17.4	21.1	4.2
Incr Delay (d2), s/veh	1.1	6.7	4.2	5.3	3.2	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	1.9	3.4	4.1	3.9	3.4	0.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.4	31.6	22.3	22.7	24.3	4.6
LnGrp LOS	C	C	C	C	C	A
Approach Vol, veh/h	387		1031			837
Approach Delay, s/veh	28.7		22.4			11.1
Approach LOS	C		C			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	21.0	26.5			47.5	16.4
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	16.5	22.0			43.0	18.0
Max Q Clear Time (g_c+I1), s	11.4	15.4			7.1	11.2
Green Ext Time (p_c), s	0.3	2.9			3.6	0.7
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			19.3			
HCM 6th LOS			B			

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	13	5	1	10	16	4	1	25	1	5	49	9
Future Vol, veh/h	13	5	1	10	16	4	1	25	1	5	49	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	17	7	1	13	21	5	1	33	1	7	65	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.4	7.3	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	4%	68%	33%	8%
Vol Thru, %	93%	26%	53%	78%
Vol Right, %	4%	5%	13%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	27	19	30	63
LT Vol	1	13	10	5
Through Vol	25	5	16	49
RT Vol	1	1	4	9
Lane Flow Rate	36	25	40	84
Geometry Grp	1	1	1	1
Degree of Util (X)	0.04	0.03	0.045	0.092
Departure Headway (Hd)	4.06	4.242	4.112	3.969
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	876	837	864	899
Service Time	2.111	2.302	2.17	2.011
HCM Lane V/C Ratio	0.041	0.03	0.046	0.093
HCM Control Delay	7.3	7.4	7.4	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0.1	0.3

HCM 6th TWSC  
4: US-69 & SE 69th St

01/28/2020

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	19	3	40	15	2	10	15	559	11	5	545	6
Future Vol, veh/h	19	3	40	15	2	10	15	559	11	5	545	6
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	-	-	-	-	-	-	100	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	38	71	62	50	50	65	81	69	50	87	50
Heavy Vehicles, %	5	0	3	20	0	0	15	20	18	0	22	0
Mvmt Flow	34	10	69	30	5	24	28	842	19	12	764	15

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1276	1713	390	1319	1711	431	779	0	0	861	0	0
Stage 1	796	796	-	908	908	-	-	-	-	-	-	-
Stage 2	480	917	-	411	803	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.5	6.96	7.9	6.5	6.9	4.4	-	-	4.1	-	-
Critical Hdwy Stg 1	6.6	5.5	-	6.9	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.5	-	6.9	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4	3.33	3.7	4	3.3	2.35	-	-	2.2	-	-
Pot Cap-1 Maneuver	121	91	606	98	92	578	754	-	-	789	-	-
Stage 1	340	402	-	263	357	-	-	-	-	-	-	-
Stage 2	528	354	-	543	399	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	107	86	606	76	87	578	754	-	-	789	-	-
Mov Cap-2 Maneuver	107	86	-	76	87	-	-	-	-	-	-	-
Stage 1	327	396	-	253	344	-	-	-	-	-	-	-
Stage 2	480	341	-	463	393	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	41.3		60.1		0.3		0.1	
HCM LOS	E		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	754	-	-	207	121	789	-
HCM Lane V/C Ratio	0.037	-	-	0.543	0.486	0.015	-
HCM Control Delay (s)	10	-	-	41.3	60.1	9.6	-
HCM Lane LOS	A	-	-	E	F	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.9	2.2	0	-

Intersection						
Int Delay, s/veh	3.4					
Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations	Y		↑↓			↑↓
Traffic Vol, veh/h	29	30	305	50	130	200
Future Vol, veh/h	29	30	305	50	130	200
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	92	77	92	80	80
Heavy Vehicles, %	2	2	8	2	2	6
Mvmt Flow	38	40	483	66	198	305

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1065	275	0	0	549
Stage 1	516	-	-	-	-
Stage 2	549	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	218	722	-	-	1017
Stage 1	564	-	-	-	-
Stage 2	542	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	167	722	-	-	1017
Mov Cap-2 Maneuver	167	-	-	-	-
Stage 1	432	-	-	-	-
Stage 2	542	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	23.3	0	4
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	274	1017	-
HCM Lane V/C Ratio	-	-	0.286	0.195	-
HCM Control Delay (s)	-	-	23.3	9.4	0.5
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.7	-

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑		↘	
Traffic Vol, veh/h	3	330	316	24	45	14
Future Vol, veh/h	3	330	316	24	45	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	25	78	89	67	77	62
Heavy Vehicles, %	0	10	6	0	7	0
Mvmt Flow	15	516	433	44	71	28

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	477	0	-	0	743
Stage 1	-	-	-	-	455
Stage 2	-	-	-	-	288
Critical Hdwy	4.1	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	5.94
Critical Hdwy Stg 2	-	-	-	-	5.94
Follow-up Hdwy	2.2	-	-	-	3.57
Pot Cap-1 Maneuver	1096	-	-	-	340
Stage 1	-	-	-	-	591
Stage 2	-	-	-	-	721
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1096	-	-	-	335
Mov Cap-2 Maneuver	-	-	-	-	442
Stage 1	-	-	-	-	583
Stage 2	-	-	-	-	721

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	13.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1096	-	-	-	501
HCM Lane V/C Ratio	0.013	-	-	-	0.197
HCM Control Delay (s)	8.3	-	-	-	13.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.7



Intersection						
Int Delay, s/veh	1.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↘	
Traffic Vol, veh/h	245	130	74	309	31	30
Future Vol, veh/h	245	130	74	309	31	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	77	77	92	80	80	92
Heavy Vehicles, %	8	8	2	6	6	2
Mvmt Flow	388	206	98	471	47	40

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	594	0	923 297
Stage 1	-	-	-	-	491 -
Stage 2	-	-	-	-	432 -
Critical Hdwy	-	-	4.14	-	6.92 6.94
Critical Hdwy Stg 1	-	-	-	-	5.92 -
Critical Hdwy Stg 2	-	-	-	-	5.92 -
Follow-up Hdwy	-	-	2.22	-	3.56 3.32
Pot Cap-1 Maneuver	-	-	978	-	262 699
Stage 1	-	-	-	-	569 -
Stage 2	-	-	-	-	611 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	978	-	236 699
Mov Cap-2 Maneuver	-	-	-	-	342 -
Stage 1	-	-	-	-	512 -
Stage 2	-	-	-	-	611 -

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	446	-	-	978	-
HCM Lane V/C Ratio	0.195	-	-	0.1	-
HCM Control Delay (s)	15	-	-	9.1	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.7	-	-	0.3	-

Intersection												
Int Delay, s/veh	8.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↕↗		↵	↕↗			↕↘			↕↗	↕↘
Traffic Vol, veh/h	49	200	30	20	255	61	3	4	5	75	10	94
Future Vol, veh/h	49	200	30	20	255	61	3	4	5	75	10	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	80	81	79	84	88	50	33	42	64	56	85
Heavy Vehicles, %	2	15	8	16	8	0	0	0	0	1	0	0
Mvmt Flow	73	305	45	31	370	85	7	15	15	143	22	135

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	455	0	0	350	0	0	732	991	175	781	971	228
Stage 1	-	-	-	-	-	-	474	474	-	475	475	-
Stage 2	-	-	-	-	-	-	258	517	-	306	496	-
Critical Hdwy	4.14	-	-	4.42	-	-	7.5	6.5	6.9	7.52	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.52	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.52	5.5	-
Follow-up Hdwy	2.22	-	-	2.36	-	-	3.5	4	3.3	3.51	4	3.3
Pot Cap-1 Maneuver	1102	-	-	1111	-	-	313	248	844	287	255	781
Stage 1	-	-	-	-	-	-	545	561	-	542	561	-
Stage 2	-	-	-	-	-	-	730	537	-	682	549	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1102	-	-	1111	-	-	223	225	844	249	232	781
Mov Cap-2 Maneuver	-	-	-	-	-	-	223	225	-	249	232	-
Stage 1	-	-	-	-	-	-	509	524	-	506	545	-
Stage 2	-	-	-	-	-	-	564	522	-	608	513	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.5			0.5			17.9			29.3		
HCM LOS							C			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	316	1102	-	-	1111	-	-	247	781
HCM Lane V/C Ratio	0.116	0.066	-	-	0.028	-	-	0.667	0.173
HCM Control Delay (s)	17.9	8.5	-	-	8.3	-	-	44.6	10.6
HCM Lane LOS	C	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	0.4	0.2	-	-	0.1	-	-	4.3	0.6

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	0	9	4	9	1	4	106	4	7	166	5
Future Vol, veh/h	5	0	9	4	9	1	4	106	4	7	166	5
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	53	40	75	25	25	25	25	88	50	58	82	42
Heavy Vehicles, %	0	0	0	0	0	0	0	1	0	0	1	0
Mvmt Flow	12	0	15	20	44	5	20	147	10	15	247	15

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	502	482	255	484	484	152	262	0	0	157	0	0
Stage 1	285	285	-	192	192	-	-	-	-	-	-	-
Stage 2	217	197	-	292	292	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	483	487	789	496	486	900	1314	-	-	1435	-	-
Stage 1	727	679	-	814	745	-	-	-	-	-	-	-
Stage 2	790	742	-	720	675	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	437	473	789	476	472	900	1314	-	-	1435	-	-
Mov Cap-2 Maneuver	437	473	-	476	472	-	-	-	-	-	-	-
Stage 1	715	671	-	800	732	-	-	-	-	-	-	-
Stage 2	726	729	-	698	667	-	-	-	-	-	-	-















Approach	EB		WB		NB		SB	
HCM Control Delay, s	11.5		13.5		0.9		0.4	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1314	-	-	582	490	1435	-
HCM Lane V/C Ratio	0.015	-	-	0.045	0.139	0.01	-
HCM Control Delay (s)	7.8	0	-	11.5	13.5	7.5	0
HCM Lane LOS	A	A	-	B	B	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	0.5	0	-

# HCM 6th Signalized Intersection Summary

## 1: US-69 & SH-69A

01/28/2020

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			 			 
Traffic Volume (veh/h)	275	450	610	85	110	530
Future Volume (veh/h)	275	450	610	85	110	530
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	1811	1856	1589	1841	1796	1574
Adj Flow Rate, veh/h	395	624	783	136	186	688
Peak Hour Factor	0.85	0.88	0.95	0.76	0.72	0.94
Percent Heavy Veh, %	6	3	21	4	7	22
Cap, veh/h	532	485	1007	521	227	1620
Arrive On Green	0.31	0.31	0.33	0.33	0.13	0.54
Sat Flow, veh/h	1725	1572	3098	1560	1711	3069
Grp Volume(v), veh/h	395	624	783	136	186	688
Grp Sat Flow(s),veh/h/ln	1725	1572	1509	1560	1711	1495
Q Serve(g_s), s	12.3	18.5	14.0	3.8	6.3	8.2
Cycle Q Clear(g_c), s	12.3	18.5	14.0	3.8	6.3	8.2
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	532	485	1007	521	227	1620
V/C Ratio(X)	0.74	1.29	0.78	0.26	0.82	0.42
Avail Cap(c_a), veh/h	532	485	1007	521	242	1620
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	18.6	20.8	18.0	14.6	25.3	8.2
Incr Delay (d2), s/veh	5.6	144.1	5.9	1.2	18.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	24.7	4.6	1.2	3.3	1.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.2	164.8	23.9	15.8	43.7	9.0
LnGrp LOS	C	F	C	B	D	A
Approach Vol, veh/h	1019		919			874
Approach Delay, s/veh	110.3		22.7			16.4
Approach LOS	F		C			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	12.5	24.5			37.0	23.0
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	8.5	19.5			32.5	18.5
Max Q Clear Time (g_c+I1), s	8.3	16.0			10.2	20.5
Green Ext Time (p_c), s	0.0	1.7			4.1	0.0
<b>Intersection Summary</b>						
HCM 6th Ctrl Delay			52.5			
HCM 6th LOS			D			

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	50	5	1	10	16	5	1	80	2	5	53	1
Future Vol, veh/h	50	5	1	10	16	5	1	80	2	5	53	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	66	7	1	13	21	7	1	106	3	7	70	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	7.6	7.9	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %		1%	89%	32%
Vol Thru, %		96%	9%	52%
Vol Right, %		2%	2%	16%
Sign Control		Stop	Stop	Stop
Traffic Vol by Lane		83	56	31
LT Vol		1	50	10
Through Vol		80	5	16
RT Vol		2	1	5
Lane Flow Rate		110	74	41
Geometry Grp		1	1	1
Degree of Util (X)		0.127	0.094	0.05
Departure Headway (Hd)		4.251	4.534	4.372
Convergence, Y/N		Yes	Yes	Yes
Cap		849	795	823
Service Time		2.251	2.539	2.379
HCM Lane V/C Ratio		0.13	0.093	0.05
HCM Control Delay		7.9	8	7.6
HCM Lane LOS		A	A	A
HCM 95th-tile Q		0.4	0.3	0.2

HCM 6th TWSC  
4: US-69 & SE 69th St

01/28/2020

Intersection												
Int Delay, s/veh	10.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	10	1	15	5	3	10	60	955	45	10	620	15
Future Vol, veh/h	10	1	15	5	3	10	60	955	45	10	620	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	45	25	46	62	38	50	64	93	50	67	92	65
Heavy Vehicles, %	0	0	15	0	0	0	0	17	5	0	20	0
Mvmt Flow	27	5	40	10	10	24	114	1253	110	18	822	28

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1732	2463	425	1986	2422	682	850	0	0	1363	0	0
Stage 1	872	872	-	1536	1536	-	-	-	-	-	-	-
Stage 2	860	1591	-	450	886	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	7.2	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.45	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	58	31	543	37	33	397	797	-	-	511	-	-
Stage 1	316	371	-	124	180	-	-	-	-	-	-	-
Stage 2	321	169	-	564	365	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	34	26	543	26	27	397	797	-	-	511	-	-
Mov Cap-2 Maneuver	34	26	-	26	27	-	-	-	-	-	-	-
Stage 1	271	358	-	106	154	-	-	-	-	-	-	-
Stage 2	242	145	-	497	352	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	229.5		184.8		0.8		0.3	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	797	-	-	68	55	511	-
HCM Lane V/C Ratio	0.144	-	-	1.055	0.798	0.036	-
HCM Control Delay (s)	10.3	-	-	229.5	184.8	12.3	-
HCM Lane LOS	B	-	-	F	F	B	-
HCM 95th %tile Q(veh)	0.5	-	-	5.4	3.4	0.1	-

Intersection						
Int Delay, s/veh	4.3					
Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations	T		T		T	
Traffic Vol, veh/h	140	30	190	2	5	560
Future Vol, veh/h	140	30	190	2	5	560
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	92	74	92	92	86
Heavy Vehicles, %	2	2	6	2	2	4
Mvmt Flow	186	40	313	3	7	794

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	726	158	0	0	316
Stage 1	315	-	-	-	-
Stage 2	411	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22
Pot Cap-1 Maneuver	360	859	-	-	1241
Stage 1	713	-	-	-	-
Stage 2	638	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	356	859	-	-	1241
Mov Cap-2 Maneuver	356	-	-	-	-
Stage 1	706	-	-	-	-
Stage 2	638	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	25.3	0	0.1
HCM LOS	D		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	397	1241	-
HCM Lane V/C Ratio	-	-	0.568	0.005	-
HCM Control Delay (s)	-	-	25.3	7.9	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	3.4	0	-

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	11	210	550	72	49	15
Future Vol, veh/h	11	210	550	72	49	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	69	85	88	86	82	62
Heavy Vehicles, %	0	4	6	0	2	7
Mvmt Flow	19	301	763	102	73	30

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	865	0	-	0	1003 433
Stage 1	-	-	-	-	814 -
Stage 2	-	-	-	-	189 -
Critical Hdwy	4.1	-	-	-	6.84 7.04
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.2	-	-	-	3.52 3.37
Pot Cap-1 Maneuver	787	-	-	-	239 557
Stage 1	-	-	-	-	396 -
Stage 2	-	-	-	-	824 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	787	-	-	-	233 557
Mov Cap-2 Maneuver	-	-	-	-	323 -
Stage 1	-	-	-	-	386 -
Stage 2	-	-	-	-	824 -

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	18.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	787	-	-	-	367
HCM Lane V/C Ratio	0.025	-	-	-	0.279
HCM Control Delay (s)	9.7	-	-	-	18.6
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1



Intersection						
Int Delay, s/veh	10.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↘	
Traffic Vol, veh/h	230	29	10	373	249	70
Future Vol, veh/h	230	29	10	373	249	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	92	92	86	92	92
Heavy Vehicles, %	6	2	2	4	2	2
Mvmt Flow	379	38	13	529	330	93

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	0	0	417	689
Stage 1	-	-	-	398
Stage 2	-	-	-	291
Critical Hdwy	-	-	4.14	6.84
Critical Hdwy Stg 1	-	-	-	5.84
Critical Hdwy Stg 2	-	-	-	5.84
Follow-up Hdwy	-	-	2.22	3.52
Pot Cap-1 Maneuver	-	-	1138	380
Stage 1	-	-	-	647
Stage 2	-	-	-	733
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	-	-	1138	376
Mov Cap-2 Maneuver	-	-	-	480
Stage 1	-	-	-	640
Stage 2	-	-	-	733

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	34.3
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	526	-	-	1138	-
HCM Lane V/C Ratio	0.804	-	-	0.012	-
HCM Control Delay (s)	34.3	-	-	8.2	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	7.7	-	-	0	-

Intersection												
Int Delay, s/veh	169											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗			↔			↖	↗
Traffic Vol, veh/h	120	197	1	4	280	125	31	32	81	58	6	42
Future Vol, veh/h	120	197	1	4	280	125	31	32	81	58	6	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	-	-	-	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	54	83	25	50	67	57	70	80	81	58	50	79
Heavy Vehicles, %	0	9	0	0	8	0	0	0	5	0	0	2
Mvmt Flow	271	290	5	10	510	268	54	49	122	122	15	65

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	778	0	0	295	0	0	1118	1633	148	1376	1501	389
Stage 1	-	-	-	-	-	-	835	835	-	664	664	-
Stage 2	-	-	-	-	-	-	283	798	-	712	837	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	7	7.5	6.5	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.35	3.5	4	3.32
Pot Cap-1 Maneuver	848	-	-	1278	-	-	164	102	863	~ 106	123	610
Stage 1	-	-	-	-	-	-	333	386	-	421	461	-
Stage 2	-	-	-	-	-	-	706	401	-	394	385	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	848	-	-	1278	-	-	96	69	863	~ 30	83	610
Mov Cap-2 Maneuver	-	-	-	-	-	-	96	69	-	~ 30	83	-
Stage 1	-	-	-	-	-	-	226	262	-	286	457	-
Stage 2	-	-	-	-	-	-	606	398	-	187	262	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	5.4			0.1			272.7			\$ 1172.5		
HCM LOS							F			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	159	848	-	-	1278	-	-	32	610
HCM Lane V/C Ratio	1.414	0.32	-	-	0.008	-	-	4.27	0.106
HCM Control Delay (s)	272.7	11.2	-	-	7.8	-	-	\$ 1723.6	11.6
HCM Lane LOS	F	B	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	14.2	1.4	-	-	0	-	-	16.2	0.4

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

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	2	6	7	5	5	9	265	3	7	93	4
Future Vol, veh/h	7	2	6	7	5	5	9	265	3	7	93	4
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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	44	50	50	44	25	42	56	80	25	58	72	100
Heavy Vehicles, %	0	0	0	14	0	0	0	0	0	0	0	0
Mvmt Flow	19	5	15	19	24	15	20	404	15	15	158	5

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	662	650	161	653	645	412	163	0	0	419	0	0
Stage 1	191	191	-	452	452	-	-	-	-	-	-	-
Stage 2	471	459	-	201	193	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.24	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.24	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.24	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.626	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	378	391	889	364	393	644	1428	-	-	1151	-	-
Stage 1	815	746	-	565	574	-	-	-	-	-	-	-
Stage 2	577	570	-	774	745	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	343	378	889	346	380	644	1428	-	-	1151	-	-
Mov Cap-2 Maneuver	343	378	-	346	380	-	-	-	-	-	-	-
Stage 1	800	736	-	555	564	-	-	-	-	-	-	-
Stage 2	530	560	-	746	735	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	13.7		15.3		0.3		0.7	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1428	-	-	453	408	1151	-	-
HCM Lane V/C Ratio	0.014	-	-	0.086	0.143	0.013	-	-
HCM Control Delay (s)	7.6	0	-	13.7	15.3	8.2	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.5	0	-	-

## **APPENDIX C**

Signal Warrant Evaluation –  
Developed Conditions

# HCS7 Warrants Report

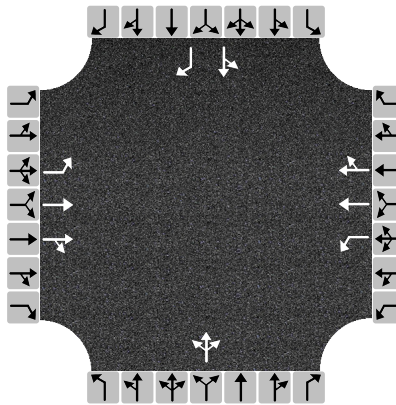
## Project Information

Analyst	D. Millican	Date	6/18/2019
Agency	Olsson	Analysis Year	2019
Jurisdiction	Pryor Creek, OK	Time Period Analyzed	12-Hour Volumes
Project Description	Zarrow St. & SH-69A		

## General

Major Street Direction	East-West	Population < 10,000	Yes
Starting Time Interval	7	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	0
Major Street Speed (mi/h)	45	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	0		

## Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Number of Lanes, N	1	2	0	1	2	0	0	1	0	0	1	1
Lane Usage	L	TR		L	TR			LTR			LT	R
Vehicle Volumes Averages (veh/h)	50	172	10	12	206	65	13	7	21	56	5	48
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.0			0.0			0.0			0.0		
Delay (veh-hrs)	0.0			0.0			0.0			0.0		

## School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	2

## Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	4
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)		Tractor-Trailer Trucks (%)	10

# HCS7 Warrants Report

## Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (70%)	4A (70%)	4B (70%)
07 - 08	607	176	800	0	0	Yes	Yes	No	Yes	Yes	No	No	No	No
08 - 09	430	126	575	0	0	No	Yes	No	No	No	No	No	No	No
09 - 10	402	86	514	0	0	No	No	No	No	No	No	No	No	No
10 - 11	387	71	481	0	0	No	No	No	No	No	No	No	No	No
11 - 12	600	107	742	0	0	No	No	No	Yes	No	No	No	No	No
12 - 13	549	169	766	0	0	Yes	Yes	No	Yes	No	No	No	No	No
13 - 14	408	102	544	0	0	No	No	No	No	No	No	No	No	No
14 - 15	524	73	654	0	0	No	No	No	Yes	No	No	No	No	No
15 - 16	599	104	747	0	0	No	No	No	Yes	No	No	No	No	No
16 - 17	683	93	868	0	0	No	No	Yes	Yes	No	No	No	No	No
17 - 18	643	120	866	0	0	No	Yes	Yes	Yes	No	No	No	No	No
18 - 19	377	93	482	0	0	No	No	No	No	No	No	No	No	No
Total	6209	1320	8039	0	0	2	4	2	7	1	0	0	0	0

## Warrants

### Warrant 1: Eight-Hour Vehicular Volume

A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--

B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--

56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)

### Warrant 2: Four-Hour Vehicular Volume

Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)

### Warrant 3: Peak Hour

A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--

B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)

### Warrant 4: Pedestrian Volume

A. Four Hour Volumes --or--

B. One-Hour Volumes

### Warrant 5: School Crossing

Gaps Same Period --and--

Student Volumes

Nearest Traffic Control Signal (optional)

### Warrant 6: Coordinated Signal System

Degree of Platooning (Predominant direction or both directions)

### Warrant 7: Crash Experience

A. Adequate trials of alternatives, observance and enforcement failed --and--

B. Reported crashes susceptible to correction by signal (12-month period) --and--

C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied

### Warrant 8: Roadway Network

A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--

B. Weekend Volume (Five hours total)

### Warrant 9: Grade Crossing

A. Grade Crossing within 140 ft --and--

B. Peak-Hour Vehicular Volumes

# HCS7 Warrants Report

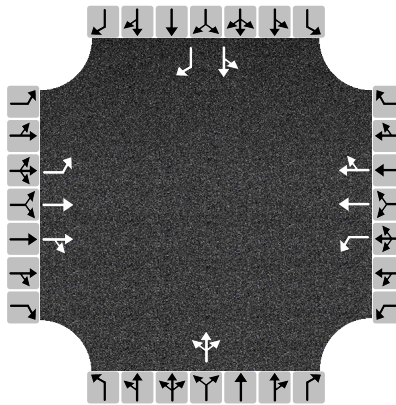
## Project Information

Analyst	D. Millican	Date	11/6/2019
Agency	Olsson	Analysis Year	2030 at Full Build-out
Jurisdiction	Pryor Creek, OK	Time Period Analyzed	12-Hour Volumes
Project Description	Zarrow St. & SH-69A		

## General

Major Street Direction	East-West	Population < 10,000	Yes
Starting Time Interval	7	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	0
Major Street Speed (mi/h)	45	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	0		

## Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Number of Lanes, N	1	2	0	1	2	0	0	1	0	0	1	1
Lane Usage	L	TR		L	TR			LTR			LT	R
Vehicle Volumes Averages (veh/h)	130	229	19	25	273	90	22	22	49	86	11	86
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.8			0.1			21.0			7.1		
Delay (veh-hrs)	0.1			0.0			1.0			0.6		

## School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	2

## Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	4
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)		Tractor-Trailer Trucks (%)	10

# HCS7 Warrants Report

## Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (70%)	4A (70%)	4B (70%)
07 - 08	708	248	975	0	0	Yes	Yes	Yes	Yes	Yes	No	No	No	No
08 - 09	604	191	819	0	0	Yes	Yes	No	Yes	Yes	No	No	No	No
09 - 10	576	151	754	0	0	Yes	Yes	No	Yes	No	No	No	No	No
10 - 11	561	136	724	0	0	No	Yes	No	Yes	No	No	No	No	No
11 - 12	764	180	979	0	0	Yes	Yes	Yes	Yes	Yes	No	No	No	No
12 - 13	758	238	1121	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
13 - 14	747	181	1042	0	0	Yes	Yes	Yes	Yes	Yes	No	No	No	No
14 - 15	900	154	1201	0	0	Yes	Yes	Yes	Yes	Yes	No	No	No	No
15 - 16	945	183	1262	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
16 - 17	1036	183	1390	0	0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
17 - 18	919	200	1312	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18 - 19	710	173	990	0	0	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Total	9228	2218	12569	0	0	11	12	9	12	10	1	4	0	0

## Warrants

<b>Warrant 1: Eight-Hour Vehicular Volume</b>	✓
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	✓
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	✓
56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	✓
<b>Warrant 2: Four-Hour Vehicular Volume</b>	✓
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	✓
<b>Warrant 3: Peak Hour</b>	✓
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	✓
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	✓
<b>Warrant 4: Pedestrian Volume</b>	
A. Four Hour Volumes --or--	
B. One-Hour Volumes	
<b>Warrant 5: School Crossing</b>	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	
<b>Warrant 6: Coordinated Signal System</b>	
Degree of Platooning (Predominant direction or both directions)	
<b>Warrant 7: Crash Experience</b>	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	✓
<b>Warrant 8: Roadway Network</b>	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
<b>Warrant 9: Grade Crossing</b>	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	



# HCS7 Warrants Report

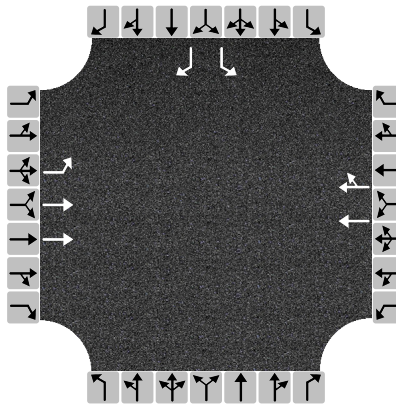
## Project Information

Analyst	D. Millican	Date	11/6/2019
Agency	Olsson	Analysis Year	2030 at Full Build-out
Jurisdiction	Pryor Creek, OK	Time Period Analyzed	12-Hour Volumes (Estimated)
Project Description	Oakwood Drive & SH-69A		

## General

Major Street Direction	East-West	Population < 10,000	Yes
Starting Time Interval	7	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	0
Major Street Speed (mi/h)	45	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	0		

## Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement												
Number of Lanes, N	1	2	0	0	2	0	0	0	0	1	0	1
Lane Usage	L	T			TR					L		R
Vehicle Volumes Averages (veh/h)	177	326	19	25	506	43	22	22	49	52	11	203
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.9			0.0			0.0			4.9		
Delay (veh-hrs)	0.2			0.0			0.0			0.7		

## School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	2

## Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	4
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)		Tractor-Trailer Trucks (%)	10

# HCS7 Warrants Report

## Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (70%)	4A (70%)	4B (70%)
07 - 08	987	258	1264	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
08 - 09	880	201	1105	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
09 - 10	862	161	1050	0	0	Yes	Yes	Yes	Yes	Yes	No	No	No	No
10 - 11	847	148	1022	0	0	Yes	Yes	Yes	Yes	Yes	No	No	No	No
11 - 12	1000	190	1225	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
12 - 13	1032	258	1415	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
13 - 14	1113	272	1499	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
14 - 15	1283	323	1753	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
15 - 16	1335	346	1815	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
16 - 17	1440	353	1976	0	0	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
17 - 18	1300	352	1845	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18 - 19	1112	332	1551	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
Total	13191	3194	17520	0	0	12	12	12	12	12	1	10	0	0

## Warrants

<b>Warrant 1: Eight-Hour Vehicular Volume</b>	✓
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	✓
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	✓
56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	✓
<b>Warrant 2: Four-Hour Vehicular Volume</b>	✓
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	✓
<b>Warrant 3: Peak Hour</b>	✓
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	✓
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	✓
<b>Warrant 4: Pedestrian Volume</b>	
A. Four Hour Volumes --or--	
B. One-Hour Volumes	
<b>Warrant 5: School Crossing</b>	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	
<b>Warrant 6: Coordinated Signal System</b>	
Degree of Platooning (Predominant direction or both directions)	
<b>Warrant 7: Crash Experience</b>	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	✓
<b>Warrant 8: Roadway Network</b>	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
<b>Warrant 9: Grade Crossing</b>	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

## **APPENDIX D**

Base plus Site Traffic on Existing Network  
Capacity Analysis Reports

# HCM 6th Signalized Intersection Summary

## 1: US-69 & SH-69A

01/28/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	198	289	537	270	268	512
Future Volume (veh/h)	198	289	537	270	268	512
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	1811	1856	1589	1841	1796	1574
Adj Flow Rate, veh/h	208	304	565	284	282	539
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	6	3	21	4	7	22
Cap, veh/h	398	363	1065	551	327	1852
Arrive On Green	0.23	0.23	0.35	0.35	0.19	0.62
Sat Flow, veh/h	1725	1572	3098	1560	1711	3069
Grp Volume(v), veh/h	208	304	565	284	282	539
Grp Sat Flow(s),veh/h/ln	1725	1572	1509	1560	1711	1495
Q Serve(g_s), s	6.3	11.1	8.9	8.6	9.6	5.0
Cycle Q Clear(g_c), s	6.3	11.1	8.9	8.6	9.6	5.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	398	363	1065	551	327	1852
V/C Ratio(X)	0.52	0.84	0.53	0.52	0.86	0.29
Avail Cap(c_a), veh/h	517	472	1065	551	328	1852
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	20.2	22.0	15.5	15.4	23.5	5.3
Incr Delay (d2), s/veh	1.1	10.0	1.9	3.4	20.2	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	2.2	4.3	2.6	2.9	5.0	0.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.2	32.0	17.3	18.8	43.7	5.7
LnGrp LOS	C	C	B	B	D	A
Approach Vol, veh/h	512		849			821
Approach Delay, s/veh	27.6		17.8			18.8
Approach LOS	C		B			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	16.0	25.7			41.6	18.4
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	11.5	17.0			33.0	18.0
Max Q Clear Time (g_c+I1), s	11.6	10.9			7.0	13.1
Green Ext Time (p_c), s	0.0	2.2			3.2	0.8

### Intersection Summary

HCM 6th Ctrl Delay	20.5
HCM 6th LOS	C

### Notes

User approved pedestrian interval to be less than phase max green.

**Intersection**

Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	6	1	184	20	5	1	31	68	6	59	11
Future Vol, veh/h	16	6	1	184	20	5	1	31	68	6	59	11
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	19	7	1	216	24	6	1	36	80	7	69	13
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	9.6	8	8.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %		1%	70%	88%
Vol Thru, %		31%	26%	10%
Vol Right, %		68%	4%	2%
Sign Control		Stop	Stop	Stop
Traffic Vol by Lane		100	23	209
LT Vol		1	16	184
Through Vol		31	6	20
RT Vol		68	1	5
Lane Flow Rate		118	27	246
Geometry Grp		1	1	1
Degree of Util (X)		0.139	0.036	0.311
Departure Headway (Hd)		4.252	4.765	4.557
Convergence, Y/N		Yes	Yes	Yes
Cap		844	751	789
Service Time		2.278	2.799	2.584
HCM Lane V/C Ratio		0.14	0.036	0.312
HCM Control Delay		8	8	9.6
HCM Lane LOS		A	A	A
HCM 95th-tile Q		0.5	0.1	1.3

HCM 6th TWSC  
4: US-69 & SE 69th St

01/28/2020

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	23	4	49	18	2	12	18	795	13	6	713	7
Future Vol, veh/h	23	4	49	18	2	12	18	795	13	6	713	7
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	-	-	-	-	-	-	100	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	15	0	0	0	0	17	5	0	20	0
Mvmt Flow	24	4	52	19	2	13	19	837	14	6	751	7

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1225	1656	379	1272	1652	426	758	0	0	851	0	0
Stage 1	767	767	-	882	882	-	-	-	-	-	-	-
Stage 2	458	889	-	390	770	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	7.2	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.45	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	137	99	583	127	100	582	862	-	-	796	-	-
Stage 1	365	414	-	312	367	-	-	-	-	-	-	-
Stage 2	557	364	-	611	413	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	129	96	583	109	97	582	862	-	-	796	-	-
Mov Cap-2 Maneuver	129	96	-	109	97	-	-	-	-	-	-	-
Stage 1	357	411	-	305	359	-	-	-	-	-	-	-
Stage 2	530	356	-	547	410	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	26		34.6		0.2		0.1	
HCM LOS	D		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	862	-	-	250	155	796	-
HCM Lane V/C Ratio	0.022	-	-	0.32	0.217	0.008	-
HCM Control Delay (s)	9.3	-	-	26	34.6	9.6	-
HCM Lane LOS	A	-	-	D	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.3	0.8	0	-

Intersection						
Int Delay, s/veh	3.9					
Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	35	44	446	61	178	420
Future Vol, veh/h	35	44	446	61	178	420
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	85	85	85	85	85	85
Heavy Vehicles, %	4	2	6	2	2	4
Mvmt Flow	41	52	525	72	209	494

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1226	299	0	0	597
Stage 1	561	-	-	-	-
Stage 2	665	-	-	-	-
Critical Hdwy	6.88	6.94	-	-	4.14
Critical Hdwy Stg 1	5.88	-	-	-	-
Critical Hdwy Stg 2	5.88	-	-	-	-
Follow-up Hdwy	3.54	3.32	-	-	2.22
Pot Cap-1 Maneuver	168	697	-	-	976
Stage 1	529	-	-	-	-
Stage 2	468	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	118	697	-	-	976
Mov Cap-2 Maneuver	118	-	-	-	-
Stage 1	373	-	-	-	-
Stage 2	468	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	32.8	0	3.4
HCM LOS	D		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	220	976	-
HCM Lane V/C Ratio	-	-	0.422	0.215	-
HCM Control Delay (s)	-	-	32.8	9.7	0.8
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	2	0.8	-

Intersection						
Int Delay, s/veh	4.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↔		↕	
Traffic Vol, veh/h	71	417	409	29	55	189
Future Vol, veh/h	71	417	409	29	55	189
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	85	85	85	85	85	85
Heavy Vehicles, %	0	4	6	0	2	7
Mvmt Flow	84	491	481	34	65	222

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	515	0	-	0	912
Stage 1	-	-	-	-	498
Stage 2	-	-	-	-	414
Critical Hdwy	4.1	-	-	-	6.84
Critical Hdwy Stg 1	-	-	-	-	5.84
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	2.2	-	-	-	3.52
Pot Cap-1 Maneuver	1061	-	-	-	273
Stage 1	-	-	-	-	576
Stage 2	-	-	-	-	635
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1061	-	-	-	243
Mov Cap-2 Maneuver	-	-	-	-	353
Stage 1	-	-	-	-	513
Stage 2	-	-	-	-	635

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	16.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1061	-	-	-	586
HCM Lane V/C Ratio	0.079	-	-	-	0.49
HCM Control Delay (s)	8.7	0.4	-	-	16.9
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	2.7



Intersection						
Int Delay, s/veh	2.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↘	↑↑	↘	
Traffic Vol, veh/h	313	159	104	400	38	44
Future Vol, veh/h	313	159	104	400	38	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	500	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	6	2	2	4	4	2
Mvmt Flow	368	187	122	471	45	52

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	555	0	942 278
Stage 1	-	-	-	-	462 -
Stage 2	-	-	-	-	480 -
Critical Hdwy	-	-	4.14	-	6.88 6.94
Critical Hdwy Stg 1	-	-	-	-	5.88 -
Critical Hdwy Stg 2	-	-	-	-	5.88 -
Follow-up Hdwy	-	-	2.22	-	3.54 3.32
Pot Cap-1 Maneuver	-	-	1011	-	258 719
Stage 1	-	-	-	-	595 -
Stage 2	-	-	-	-	582 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1011	-	227 719
Mov Cap-2 Maneuver	-	-	-	-	326 -
Stage 1	-	-	-	-	523 -
Stage 2	-	-	-	-	582 -

Approach	EB	WB	NB
HCM Control Delay, s	0	1.9	14.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	461	-	-	1011	-
HCM Lane V/C Ratio	0.209	-	-	0.121	-
HCM Control Delay (s)	14.9	-	-	9.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0.4	-

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔			↔	↔
Traffic Vol, veh/h	70	200	30	20	255	70	3	5	5	94	14	131
Future Vol, veh/h	70	200	30	20	255	70	3	5	5	94	14	131
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	9	0	0	8	0	0	0	5	0	0	2
Mvmt Flow	78	222	33	22	283	78	3	6	6	104	16	146

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	361	0	0	255	0	0	589	800	128	636	777	181
Stage 1	-	-	-	-	-	-	395	395	-	366	366	-
Stage 2	-	-	-	-	-	-	194	405	-	270	411	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	7	7.5	6.5	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.35	3.5	4	3.32
Pot Cap-1 Maneuver	1209	-	-	1322	-	-	396	320	889	367	330	831
Stage 1	-	-	-	-	-	-	607	608	-	631	626	-
Stage 2	-	-	-	-	-	-	795	602	-	718	598	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1209	-	-	1322	-	-	291	290	889	333	299	831
Mov Cap-2 Maneuver	-	-	-	-	-	-	291	290	-	333	299	-
Stage 1	-	-	-	-	-	-	561	562	-	583	613	-
Stage 2	-	-	-	-	-	-	626	589	-	653	553	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	2			0.5			14.5			15.7		
HCM LOS							B			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	392	1209	-	-	1322	-	-	328	831
HCM Lane V/C Ratio	0.037	0.064	-	-	0.017	-	-	0.366	0.175
HCM Control Delay (s)	14.5	8.2	0.2	-	7.8	0.1	-	22.2	10.3
HCM Lane LOS	B	A	A	-	A	A	-	C	B
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0.1	-	-	1.6	0.6

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Vol, veh/h	23	0	69	4	9	1	35	106	4	9	203	13
Future Vol, veh/h	23	0	69	4	9	1	35	106	4	9	203	13
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	-	-	-	-	-	-	-	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	14	0	0	0	0	0	0	0	0
Mvmt Flow	26	0	77	4	10	1	39	118	4	10	226	14

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	457	453	233	490	458	120	240	0	0	122	0	0
Stage 1	253	253	-	198	198	-	-	-	-	-	-	-
Stage 2	204	200	-	292	260	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.24	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.24	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.24	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.626	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	517	506	811	470	502	937	1339	-	-	1478	-	-
Stage 1	756	701	-	777	741	-	-	-	-	-	-	-
Stage 2	803	739	-	691	697	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	494	487	811	413	483	937	1339	-	-	1478	-	-
Mov Cap-2 Maneuver	494	487	-	413	483	-	-	-	-	-	-	-
Stage 1	733	696	-	753	718	-	-	-	-	-	-	-
Stage 2	766	716	-	621	692	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	11		12.8		1.9		0.3	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1339	-	-	699	476	1478	-	-
HCM Lane V/C Ratio	0.029	-	-	0.146	0.033	0.007	-	-
HCM Control Delay (s)	7.8	0	-	11	12.8	7.5	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0.1	0	-	-

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	7	73	204	0	0	5
Future Vol, veh/h	7	73	204	0	0	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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	86	240	0	0	6
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	240	0	-	0	342	240
Stage 1	-	-	-	-	240	-
Stage 2	-	-	-	-	102	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1327	-	-	-	654	799
Stage 1	-	-	-	-	800	-
Stage 2	-	-	-	-	922	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1327	-	-	-	650	799
Mov Cap-2 Maneuver	-	-	-	-	650	-
Stage 1	-	-	-	-	795	-
Stage 2	-	-	-	-	922	-
Approach	EB	WB	SB			
HCM Control Delay, s	0.7	0	9.5			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1327	-	-	-	-	799
HCM Lane V/C Ratio	0.006	-	-	-	-	0.007
HCM Control Delay (s)	7.7	0	-	-	-	9.5
HCM Lane LOS	A	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-	0

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	7	66	199	0	0	5
Future Vol, veh/h	7	66	199	0	0	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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	78	234	0	0	6

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	234	0	-	0	328 234
Stage 1	-	-	-	-	234 -
Stage 2	-	-	-	-	94 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1333	-	-	-	666 805
Stage 1	-	-	-	-	805 -
Stage 2	-	-	-	-	930 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1333	-	-	-	662 805
Mov Cap-2 Maneuver	-	-	-	-	662 -
Stage 1	-	-	-	-	800 -
Stage 2	-	-	-	-	930 -

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1333	-	-	-	-	805
HCM Lane V/C Ratio	0.006	-	-	-	-	0.007
HCM Control Delay (s)	7.7	0	-	-	0	9.5
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	-	0

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	3	63	199	2	1	0
Future Vol, veh/h	3	63	199	2	1	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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	74	234	2	1	0
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	236	0	-	0	317	235
Stage 1	-	-	-	-	235	-
Stage 2	-	-	-	-	82	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1331	-	-	-	676	804
Stage 1	-	-	-	-	804	-
Stage 2	-	-	-	-	941	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1331	-	-	-	674	804
Mov Cap-2 Maneuver	-	-	-	-	674	-
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	941	-
Approach	EB	WB	SB			
HCM Control Delay, s	0.4	0	10.4			
HCM LOS			B			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1331	-	-	-	-	674
HCM Lane V/C Ratio	0.003	-	-	-	-	0.002
HCM Control Delay (s)	7.7	0	-	-	-	10.4
HCM Lane LOS	A	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	5	59	198	1	0	3
Future Vol, veh/h	5	59	198	1	0	3
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	69	233	1	0	4

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	234	0	0 315 234
Stage 1	-	-	- 234 -
Stage 2	-	-	- 81 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1333	-	- 678 805
Stage 1	-	-	- 805 -
Stage 2	-	-	- 942 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1333	-	- 675 805
Mov Cap-2 Maneuver	-	-	- 675 -
Stage 1	-	-	- 801 -
Stage 2	-	-	- 942 -

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1333	-	-	-	805
HCM Lane V/C Ratio	0.004	-	-	-	0.004
HCM Control Delay (s)	7.7	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	2	57	197	1	0	2
Future Vol, veh/h	2	57	197	1	0	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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	67	232	1	0	2
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	233	0	-	0	304	233
Stage 1	-	-	-	-	233	-
Stage 2	-	-	-	-	71	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1335	-	-	-	688	806
Stage 1	-	-	-	-	806	-
Stage 2	-	-	-	-	952	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1335	-	-	-	687	806
Mov Cap-2 Maneuver	-	-	-	-	687	-
Stage 1	-	-	-	-	804	-
Stage 2	-	-	-	-	952	-
Approach	EB	WB	SB			
HCM Control Delay, s	0.3	0	9.5			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1335	-	-	-	806	
HCM Lane V/C Ratio	0.002	-	-	-	0.003	
HCM Control Delay (s)	7.7	0	-	-	9.5	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0	



Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	20	37	114	8	10	84
Future Vol, veh/h	20	37	114	8	10	84
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	44	134	9	12	99

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	143	0	-	0	231
Stage 1	-	-	-	-	139
Stage 2	-	-	-	-	92
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1440	-	-	-	757
Stage 1	-	-	-	-	888
Stage 2	-	-	-	-	932
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1440	-	-	-	744
Mov Cap-2 Maneuver	-	-	-	-	744
Stage 1	-	-	-	-	873
Stage 2	-	-	-	-	932

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1440	-	-	-	744	909
HCM Lane V/C Ratio	0.016	-	-	-	0.016	0.109
HCM Control Delay (s)	7.5	0	-	-	9.9	9.4
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0	0.4

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	2	45	120	1	0	2
Future Vol, veh/h	2	45	120	1	0	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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	53	141	1	0	2
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	142	0	-	0	199	142
Stage 1	-	-	-	-	142	-
Stage 2	-	-	-	-	57	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1441	-	-	-	790	906
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	966	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1441	-	-	-	789	906
Mov Cap-2 Maneuver	-	-	-	-	789	-
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	966	-
Approach	EB	WB	SB			
HCM Control Delay, s	0.3	0	9			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1441	-	-	-	906	
HCM Lane V/C Ratio	0.002	-	-	-	0.003	
HCM Control Delay (s)	7.5	0	-	-	9	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0	

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	7	38	95	9	22	26
Future Vol, veh/h	7	38	95	9	22	26
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	45	112	11	26	31

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	123	0	-	0	179 118
Stage 1	-	-	-	-	118 -
Stage 2	-	-	-	-	61 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1464	-	-	-	811 934
Stage 1	-	-	-	-	907 -
Stage 2	-	-	-	-	962 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1464	-	-	-	806 934
Mov Cap-2 Maneuver	-	-	-	-	806 -
Stage 1	-	-	-	-	902 -
Stage 2	-	-	-	-	962 -

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	9.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1464	-	-	-	871
HCM Lane V/C Ratio	0.006	-	-	-	0.065
HCM Control Delay (s)	7.5	0	-	-	9.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	4.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	14	46	59	16	45	45
Future Vol, veh/h	14	46	59	16	45	45
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	82	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	16	56	69	19	53	53

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	88	0	-	0	167 79
Stage 1	-	-	-	-	79 -
Stage 2	-	-	-	-	88 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1520	-	-	-	828 987
Stage 1	-	-	-	-	949 -
Stage 2	-	-	-	-	940 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1520	-	-	-	819 987
Mov Cap-2 Maneuver	-	-	-	-	819 -
Stage 1	-	-	-	-	939 -
Stage 2	-	-	-	-	940 -

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1520	-	-	-	819	987
HCM Lane V/C Ratio	0.011	-	-	-	0.065	0.054
HCM Control Delay (s)	7.4	0	-	-	9.7	8.9
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0.2

# HCM 6th Signalized Intersection Summary

## 1: US-69 & SH-69A

01/28/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	434	708	713	230	330	620
Future Volume (veh/h)	434	708	713	230	330	620
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	1811	1856	1589	1841	1796	1574
Adj Flow Rate, veh/h	457	745	751	242	347	653
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	6	3	21	4	7	22
Cap, veh/h	517	472	855	442	328	1645
Arrive On Green	0.30	0.30	0.28	0.28	0.19	0.55
Sat Flow, veh/h	1725	1572	3098	1560	1711	3069
Grp Volume(v), veh/h	457	745	751	242	347	653
Grp Sat Flow(s),veh/h/ln	1725	1572	1509	1560	1711	1495
Q Serve(g_s), s	15.1	18.0	14.2	7.9	11.5	7.5
Cycle Q Clear(g_c), s	15.1	18.0	14.2	7.9	11.5	7.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	517	472	855	442	328	1645
V/C Ratio(X)	0.88	1.58	0.88	0.55	1.06	0.40
Avail Cap(c_a), veh/h	517	472	855	442	328	1645
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	20.0	21.0	20.5	18.2	24.3	7.8
Incr Delay (d2), s/veh	16.4	270.7	12.4	4.8	65.9	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	40.6	5.4	2.9	9.8	1.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	36.4	291.7	32.9	23.1	90.1	8.5
LnGrp LOS	D	F	C	C	F	A
Approach Vol, veh/h	1202		993			1000
Approach Delay, s/veh	194.6		30.5			36.8
Approach LOS	F		C			D
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	16.0	21.5			37.5	22.5
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	11.5	17.0			33.0	18.0
Max Q Clear Time (g_c+I1), s	13.5	16.2			9.5	20.0
Green Ext Time (p_c), s	0.0	0.4			3.9	0.0

### Intersection Summary

HCM 6th Ctrl Delay	94.2
HCM 6th LOS	F

### Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	14.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	6	1	275	20	6	1	98	313	6	65	1
Future Vol, veh/h	16	6	1	275	20	6	1	98	313	6	65	1
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	19	7	1	324	24	7	1	115	368	7	76	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.4	15.1	15.6	9.6
HCM LOS	A	C	C	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	70%	91%	8%
Vol Thru, %	24%	26%	7%	90%
Vol Right, %	76%	4%	2%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	412	23	301	72
LT Vol	1	16	275	6
Through Vol	98	6	20	65
RT Vol	313	1	6	1
Lane Flow Rate	485	27	354	85
Geometry Grp	1	1	1	1
Degree of Util (X)	0.637	0.046	0.545	0.134
Departure Headway (Hd)	4.73	6.092	5.545	5.709
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	771	586	652	626
Service Time	2.73	4.15	3.583	3.76
HCM Lane V/C Ratio	0.629	0.046	0.543	0.136
HCM Control Delay	15.6	9.4	15.1	9.6
HCM Lane LOS	C	A	C	A
HCM 95th-tile Q	4.6	0.1	3.3	0.5

HCM 6th TWSC  
4: US-69 & SE 69th St

01/28/2020

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	12	1	18	6	4	12	73	1293	55	12	926	12
Future Vol, veh/h	12	1	18	6	4	12	73	1293	55	12	926	12
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	-	-	-	-	-	-	100	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	15	0	0	0	0	17	5	0	20	0
Mvmt Flow	13	1	19	6	4	13	77	1361	58	13	975	13

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1845	2581	494	2058	2558	710	988	0	0	1419	0	0
Stage 1	1008	1008	-	1544	1544	-	-	-	-	-	-	-
Stage 2	837	1573	-	514	1014	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	7.2	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.45	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	47	26	488	33	27	381	708	-	-	486	-	-
Stage 1	261	321	-	122	178	-	-	-	-	-	-	-
Stage 2	332	172	-	517	319	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	35	23	488	28	23	381	708	-	-	486	-	-
Mov Cap-2 Maneuver	35	23	-	28	23	-	-	-	-	-	-	-
Stage 1	233	312	-	109	159	-	-	-	-	-	-	-
Stage 2	279	153	-	482	310	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	89.3		121		0.5		0.2	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	708	-	-	73	52	486	-
HCM Lane V/C Ratio	0.109	-	-	0.447	0.445	0.026	-
HCM Control Delay (s)	10.7	-	-	89.3	121	12.6	-
HCM Lane LOS	B	-	-	F	F	B	-
HCM 95th %tile Q(veh)	0.4	-	-	1.8	1.7	0.1	-

Intersection						
Int Delay, s/veh	39.3					
Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations	Y		↑↑			↑↑
Traffic Vol, veh/h	171	63	554	2	25	940
Future Vol, veh/h	171	63	554	2	25	940
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	85	85	85	85	85	85
Heavy Vehicles, %	4	2	6	2	2	4
Mvmt Flow	201	74	652	2	29	1106

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1264	327	0	0	654	0
Stage 1	653	-	-	-	-	-
Stage 2	611	-	-	-	-	-
Critical Hdwy	6.88	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.88	-	-	-	-	-
Critical Hdwy Stg 2	5.88	-	-	-	-	-
Follow-up Hdwy	3.54	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	~ 159	669	-	-	929	-
Stage 1	474	-	-	-	-	-
Stage 2	499	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	~ 146	669	-	-	929	-
Mov Cap-2 Maneuver	~ 146	-	-	-	-	-
Stage 1	436	-	-	-	-	-
Stage 2	499	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	292.7	0	0.5
HCM LOS	F		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	185	929	-
HCM Lane V/C Ratio	-	-	1.488	0.032	-
HCM Control Delay (s)	-	-	292.7	9	0.3
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	17.3	0.1	-

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



Intersection

Int Delay, s/veh	3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑	
Traffic Vol, veh/h	314	304	684	98	60	281
Future Vol, veh/h	314	304	684	98	60	281
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	85	85	85	85	85	85
Heavy Vehicles, %	0	4	6	0	2	7
Mvmt Flow	369	358	805	115	71	331

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	920	0	-	0	1780 460
Stage 1	-	-	-	-	863 -
Stage 2	-	-	-	-	917 -
Critical Hdwy	4.1	-	-	-	6.84 7.04
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.2	-	-	-	3.52 3.37
Pot Cap-1 Maneuver	750	-	-	-	73 535
Stage 1	-	-	-	-	373 -
Stage 2	-	-	-	-	350 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	750	-	-	-	~ 28 535
Mov Cap-2 Maneuver	-	-	-	-	~ -47 -
Stage 1	-	-	-	-	144 -
Stage 2	-	-	-	-	350 -

Approach	EB	WB	SB
HCM Control Delay, s	8	0	0.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	750	-	-	-	+
HCM Lane V/C Ratio	0.493	-	-	-	-
HCM Control Delay (s)	14.4	1.4	-	-	0.8
HCM Lane LOS	B	A	-	-	A
HCM 95th %tile Q(veh)	2.8	-	-	-	-

Notes

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

Intersection						
Int Delay, s/veh	20.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↗	
Traffic Vol, veh/h	329	35	28	478	304	108
Future Vol, veh/h	329	35	28	478	304	108
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	500	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	6	2	2	4	4	2
Mvmt Flow	387	41	33	562	358	127

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	428	0	755
Stage 1	-	-	-	-	408
Stage 2	-	-	-	-	347
Critical Hdwy	-	-	4.14	-	6.88
Critical Hdwy Stg 1	-	-	-	-	5.88
Critical Hdwy Stg 2	-	-	-	-	5.88
Follow-up Hdwy	-	-	2.22	-	3.54
Pot Cap-1 Maneuver	-	-	1128	- ~	340
Stage 1	-	-	-	-	634
Stage 2	-	-	-	-	681
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1128	- ~	330
Mov Cap-2 Maneuver	-	-	-	-	439
Stage 1	-	-	-	-	616
Stage 2	-	-	-	-	681

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	63.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	497	-	-	1128	-
HCM Lane V/C Ratio	0.975	-	-	0.029	-
HCM Control Delay (s)	63.3	-	-	8.3	-
HCM Lane LOS	F	-	-	A	-
HCM 95th %tile Q(veh)	12.7	-	-	0.1	-

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

Intersection												
Int Delay, s/veh	20											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	↔
Traffic Vol, veh/h	217	240	1	4	280	154	31	39	81	81	12	81
Future Vol, veh/h	217	240	1	4	280	154	31	39	81	81	12	81
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	9	0	0	8	0	0	0	5	0	0	2
Mvmt Flow	241	267	1	4	311	171	34	43	90	90	13	90

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	482	0	0	268	0	0	920	1240	134	1042	1155	241
Stage 1	-	-	-	-	-	-	750	750	-	405	405	-
Stage 2	-	-	-	-	-	-	170	490	-	637	750	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.5	6.5	7	7.5	6.5	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.35	3.5	4	3.32
Pot Cap-1 Maneuver	1091	-	-	1307	-	-	229	177	881	187	199	760
Stage 1	-	-	-	-	-	-	374	422	-	599	602	-
Stage 2	-	-	-	-	-	-	821	552	-	437	422	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1091	-	-	1307	-	-	150	130	881	101	147	760
Mov Cap-2 Maneuver	-	-	-	-	-	-	150	130	-	101	147	-
Stage 1	-	-	-	-	-	-	277	312	-	443	600	-
Stage 2	-	-	-	-	-	-	705	550	-	250	312	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	4.6			0.1			43.8			89.8		
HCM LOS							E			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	252	1091	-	-	1307	-	-	105	760
HCM Lane V/C Ratio	0.666	0.221	-	-	0.003	-	-	0.984	0.118
HCM Control Delay (s)	43.8	9.2	0.4	-	7.8	0	-	159	10.4
HCM Lane LOS	E	A	A	-	A	A	-	F	B
HCM 95th %tile Q(veh)	4.3	0.8	-	-	0	-	-	6.1	0.4

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Vol, veh/h	26	4	74	7	5	5	116	265	3	7	93	31
Future Vol, veh/h	26	4	74	7	5	5	116	265	3	7	93	31
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	-	-	-	-	-	-	-	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	14	0	0	0	0	0	0	0	0
Mvmt Flow	29	4	82	8	6	6	129	294	3	8	103	34

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	696	691	120	733	707	296	137	0	0	297	0	0
Stage 1	136	136	-	554	554	-	-	-	-	-	-	-
Stage 2	560	555	-	179	153	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.24	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.24	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.24	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.626	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	359	370	937	321	363	748	1459	-	-	1276	-	-
Stage 1	872	788	-	496	517	-	-	-	-	-	-	-
Stage 2	516	516	-	796	775	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	322	329	937	265	323	748	1459	-	-	1276	-	-
Mov Cap-2 Maneuver	322	329	-	265	323	-	-	-	-	-	-	-
Stage 1	780	783	-	443	462	-	-	-	-	-	-	-
Stage 2	452	461	-	718	770	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.4		15.9		2.3		0.4	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1459	-	-	605	350	1276	-
HCM Lane V/C Ratio	0.088	-	-	0.191	0.054	0.006	-
HCM Control Delay (s)	7.7	0	-	12.4	15.9	7.8	-
HCM Lane LOS	A	A	-	B	C	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.7	0.2	0	-

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	46	279	251	0	0	50
Future Vol, veh/h	46	279	251	0	0	50
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	328	295	0	0	59

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	295	0	-	0	731 295
Stage 1	-	-	-	-	295 -
Stage 2	-	-	-	-	436 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1266	-	-	-	389 744
Stage 1	-	-	-	-	755 -
Stage 2	-	-	-	-	652 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1266	-	-	-	369 744
Mov Cap-2 Maneuver	-	-	-	-	369 -
Stage 1	-	-	-	-	716 -
Stage 2	-	-	-	-	652 -

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1266	-	-	-	744
HCM Lane V/C Ratio	0.043	-	-	-	0.079
HCM Control Delay (s)	8	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	46	233	201	0	0	50
Future Vol, veh/h	46	233	201	0	0	50
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	274	236	0	0	59

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	236	0	-	0	618 236
Stage 1	-	-	-	-	236 -
Stage 2	-	-	-	-	382 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1331	-	-	-	453 803
Stage 1	-	-	-	-	803 -
Stage 2	-	-	-	-	690 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1331	-	-	-	431 803
Mov Cap-2 Maneuver	-	-	-	-	431 -
Stage 1	-	-	-	-	764 -
Stage 2	-	-	-	-	690 -

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1331	-	-	-	-	803
HCM Lane V/C Ratio	0.041	-	-	-	-	0.073
HCM Control Delay (s)	7.8	0	-	-	0	9.8
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.2

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	13	220	187	9	5	14
Future Vol, veh/h	13	220	187	9	5	14
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	259	220	11	6	16

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	231	0	-	0	515 226
Stage 1	-	-	-	-	226 -
Stage 2	-	-	-	-	289 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1337	-	-	-	520 813
Stage 1	-	-	-	-	812 -
Stage 2	-	-	-	-	760 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1337	-	-	-	513 813
Mov Cap-2 Maneuver	-	-	-	-	513 -
Stage 1	-	-	-	-	801 -
Stage 2	-	-	-	-	760 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1337	-	-	-	705
HCM Lane V/C Ratio	0.011	-	-	-	0.032
HCM Control Delay (s)	7.7	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	34	191	160	6	6	36
Future Vol, veh/h	34	191	160	6	6	36
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	225	188	7	7	42

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	195	0	-	0	497 192
Stage 1	-	-	-	-	192 -
Stage 2	-	-	-	-	305 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1378	-	-	-	532 850
Stage 1	-	-	-	-	841 -
Stage 2	-	-	-	-	748 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1378	-	-	-	514 850
Mov Cap-2 Maneuver	-	-	-	-	514 -
Stage 1	-	-	-	-	813 -
Stage 2	-	-	-	-	748 -

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1378	-	-	-	777
HCM Lane V/C Ratio	0.029	-	-	-	0.064
HCM Control Delay (s)	7.7	0	-	-	9.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2



Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	17	180	148	3	4	18
Future Vol, veh/h	17	180	148	3	4	18
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	212	174	4	5	21

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	178	0	-	0	428
Stage 1	-	-	-	-	176
Stage 2	-	-	-	-	252
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1398	-	-	-	584
Stage 1	-	-	-	-	855
Stage 2	-	-	-	-	790
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1398	-	-	-	575
Mov Cap-2 Maneuver	-	-	-	-	575
Stage 1	-	-	-	-	841
Stage 2	-	-	-	-	790

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1398	-	-	-	794
HCM Lane V/C Ratio	0.014	-	-	-	0.033
HCM Control Delay (s)	7.6	0	-	-	9.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	68	116	115	28	19	36
Future Vol, veh/h	68	116	115	28	19	36
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	80	136	135	33	22	42

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	168	0	-	0	448 152
Stage 1	-	-	-	-	152 -
Stage 2	-	-	-	-	296 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1410	-	-	-	568 894
Stage 1	-	-	-	-	876 -
Stage 2	-	-	-	-	755 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1410	-	-	-	533 894
Mov Cap-2 Maneuver	-	-	-	-	533 -
Stage 1	-	-	-	-	823 -
Stage 2	-	-	-	-	755 -

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1410	-	-	-	533	894
HCM Lane V/C Ratio	0.057	-	-	-	0.042	0.047
HCM Control Delay (s)	7.7	0	-	-	12.1	9.2
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.1	0.1

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	17	118	125	3	3	18
Future Vol, veh/h	17	118	125	3	3	18
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	139	147	4	4	21

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	151	0	-	0	328 149
Stage 1	-	-	-	-	149 -
Stage 2	-	-	-	-	179 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1430	-	-	-	666 898
Stage 1	-	-	-	-	879 -
Stage 2	-	-	-	-	852 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1430	-	-	-	656 898
Mov Cap-2 Maneuver	-	-	-	-	656 -
Stage 1	-	-	-	-	866 -
Stage 2	-	-	-	-	852 -

Approach	EB	WB	SB
HCM Control Delay, s	1	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1430	-	-	-	853
HCM Lane V/C Ratio	0.014	-	-	-	0.029
HCM Control Delay (s)	7.6	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	24	97	111	30	15	17
Future Vol, veh/h	24	97	111	30	15	17
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	114	131	35	18	20

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	166	0	-	0	319 149
Stage 1	-	-	-	-	149 -
Stage 2	-	-	-	-	170 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1412	-	-	-	674 898
Stage 1	-	-	-	-	879 -
Stage 2	-	-	-	-	860 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1412	-	-	-	660 898
Mov Cap-2 Maneuver	-	-	-	-	660 -
Stage 1	-	-	-	-	861 -
Stage 2	-	-	-	-	860 -

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1412	-	-	-	768
HCM Lane V/C Ratio	0.02	-	-	-	0.049
HCM Control Delay (s)	7.6	0	-	-	9.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	46	66	117	55	35	24
Future Vol, veh/h	46	66	117	55	35	24
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	82	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	54	80	138	65	41	28

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	203	0	-	0	359 171
Stage 1	-	-	-	-	171 -
Stage 2	-	-	-	-	188 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1381	-	-	-	644 878
Stage 1	-	-	-	-	864 -
Stage 2	-	-	-	-	849 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1381	-	-	-	618 878
Mov Cap-2 Maneuver	-	-	-	-	618 -
Stage 1	-	-	-	-	829 -
Stage 2	-	-	-	-	849 -

Approach	EB	WB	SB
HCM Control Delay, s	3.1	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1381	-	-	-	618	878
HCM Lane V/C Ratio	0.039	-	-	-	0.067	0.032
HCM Control Delay (s)	7.7	0	-	-	11.2	9.2
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	0.1

## **APPENDIX E**

Base plus Site Traffic on Proposed Network  
Capacity Analysis Reports

# HCM 6th Signalized Intersection Summary

## 1: US-69 & SH-69A

01/28/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔↔	↑↑	↔	↔↔	↑↑
Traffic Volume (veh/h)	198	289	537	270	268	512
Future Volume (veh/h)	198	289	537	270	268	512
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	1811	1856	1589	1841	1796	1574
Adj Flow Rate, veh/h	208	304	565	284	282	539
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	6	3	21	4	7	22
Cap, veh/h	534	442	1494	772	399	2064
Arrive On Green	0.16	0.16	0.49	0.49	0.12	0.69
Sat Flow, veh/h	3346	2768	3098	1560	3319	3069
Grp Volume(v), veh/h	208	304	565	284	282	539
Grp Sat Flow(s),veh/h/ln	1673	1384	1509	1560	1659	1495
Q Serve(g_s), s	3.3	6.2	7.0	6.7	4.9	4.1
Cycle Q Clear(g_c), s	3.3	6.2	7.0	6.7	4.9	4.1
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	534	442	1494	772	399	2064
V/C Ratio(X)	0.39	0.69	0.38	0.37	0.71	0.26
Avail Cap(c_a), veh/h	1004	830	1494	772	636	2064
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	22.6	23.8	9.4	9.4	25.4	3.5
Incr Delay (d2), s/veh	0.5	1.9	0.7	1.3	2.3	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	1.1	1.8	1.7	1.8	1.8	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.0	25.7	10.1	10.7	27.7	3.8
LnGrp LOS	C	C	B	B	C	A
Approach Vol, veh/h	512		849			821
Approach Delay, s/veh	24.6		10.3			12.0
Approach LOS	C		B			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	11.7	34.2			45.9	14.1
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	11.5	17.0			33.0	18.0
Max Q Clear Time (g_c+I1), s	6.9	9.0			6.1	8.2
Green Ext Time (p_c), s	0.4	2.7			3.2	1.4

### Intersection Summary

HCM 6th Ctrl Delay	14.3
HCM 6th LOS	B

### Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary  
 14: SH-69A & Oakwood Dr

01/28/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Traffic Volume (veh/h)	71	417	409	29	55	189	
Future Volume (veh/h)	71	417	409	29	55	189	
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	1900	1841	1811	1811	1870	1796	
Adj Flow Rate, veh/h	84	491	481	34	65	222	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	
Percent Heavy Veh, %	0	4	6	6	2	7	
Cap, veh/h	268	1129	631	44	960	820	
Arrive On Green	0.06	0.32	0.19	0.19	0.54	0.54	
Sat Flow, veh/h	1810	3589	3351	230	1781	1522	
Grp Volume(v), veh/h	84	491	253	262	65	222	
Grp Sat Flow(s),veh/h/ln	1810	1749	1721	1770	1781	1522	
Q Serve(g_s), s	2.3	7.2	9.0	9.1	1.1	5.1	
Cycle Q Clear(g_c), s	2.3	7.2	9.0	9.1	1.1	5.1	
Prop In Lane	1.00			0.13	1.00	1.00	
Lane Grp Cap(c), veh/h	268	1129	333	342	960	820	
V/C Ratio(X)	0.31	0.43	0.76	0.76	0.07	0.27	
Avail Cap(c_a), veh/h	521	1910	476	490	960	820	
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	18.5	17.3	24.8	24.8	7.2	8.1	
Incr Delay (d2), s/veh	0.7	0.3	4.4	4.4	0.1	0.8	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.8	2.4	3.5	3.7	0.4	6.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	19.2	17.6	29.2	29.2	7.3	8.9	
LnGrp LOS	B	B	C	C	A	A	
Approach Vol, veh/h		575	515		287		
Approach Delay, s/veh		17.8	29.2		8.5		
Approach LOS		B	C		A		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				25.5	39.5	8.4	17.1
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				35.5	20.5	13.0	18.0
Max Q Clear Time (g_c+I1), s				9.2	7.1	4.3	11.1
Green Ext Time (p_c), s				2.8	0.8	0.1	1.5
<b>Intersection Summary</b>							
HCM 6th Ctrl Delay			20.1				
HCM 6th LOS			C				
<b>Notes</b>							
User approved pedestrian interval to be less than phase max green.							



# HCM 6th Signalized Intersection Summary

## 21: Zarrow St & SH-69A

01/28/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (veh/h)	70	200	30	20	255	70	3	5	5	94	14	131
Future Volume (veh/h)	70	200	30	20	255	70	3	5	5	94	14	131
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	1900	1767	1767	1900	1781	1781	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	78	222	33	22	283	78	3	6	6	104	16	146
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	9	9	0	8	8	0	0	0	0	0	0
Cap, veh/h	401	684	100	421	494	134	225	108	108	306	27	249
Arrive On Green	0.07	0.23	0.23	0.03	0.19	0.19	0.12	0.12	0.12	0.17	0.17	0.17
Sat Flow, veh/h	1810	2937	431	1810	2633	712	1810	872	872	1810	161	1473
Grp Volume(v), veh/h	78	126	129	22	180	181	3	0	12	104	0	162
Grp Sat Flow(s),veh/h/ln	1810	1678	1689	1810	1692	1653	1810	0	1743	1810	0	1635
Q Serve(g_s), s	1.3	2.5	2.6	0.4	3.9	4.0	0.1	0.0	0.2	2.0	0.0	3.7
Cycle Q Clear(g_c), s	1.3	2.5	2.6	0.4	3.9	4.0	0.1	0.0	0.2	2.0	0.0	3.7
Prop In Lane	1.00		0.25	1.00		0.43	1.00		0.50	1.00		0.90
Lane Grp Cap(c), veh/h	401	391	393	421	318	310	225	0	216	306	0	276
V/C Ratio(X)	0.19	0.32	0.33	0.05	0.57	0.58	0.01	0.00	0.06	0.34	0.00	0.59
Avail Cap(c_a), veh/h	921	1187	1195	619	819	800	696	0	671	1011	0	913
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	11.7	12.8	12.8	12.6	14.9	14.9	15.5	0.0	15.6	14.8	0.0	15.4
Incr Delay (d2), s/veh	0.2	0.5	0.5	0.1	1.6	1.7	0.0	0.0	0.1	0.7	0.0	2.0
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	0.4	0.7	0.8	0.1	1.3	1.3	0.0	0.0	0.1	0.8	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.0	13.3	13.3	12.6	16.5	16.7	15.5	0.0	15.7	15.4	0.0	17.4
LnGrp LOS	B	B	B	B	B	B	B	A	B	B	A	B
Approach Vol, veh/h		333			383			15			266	
Approach Delay, s/veh		13.0			16.3			15.6			16.6	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		9.5	5.6	13.9		11.3	7.4	12.1				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		15.5	5.5	28.5		22.5	14.5	19.5				
Max Q Clear Time (g_c+I1), s		2.2	2.4	4.6		5.7	3.3	6.0				
Green Ext Time (p_c), s		0.0	0.0	1.3		1.1	0.1	1.5				

### Intersection Summary

HCM 6th Ctrl Delay	15.3
HCM 6th LOS	B

### Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th TWSC  
4: US-69 & SE 69th St

01/28/2020

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	23	4	49	18	2	12	18	795	13	6	713	7
Future Vol, veh/h	23	4	49	18	2	12	18	795	13	6	713	7
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	-	-	-	-	-	-	100	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	15	0	0	0	0	17	5	0	20	0
Mvmt Flow	24	4	52	19	2	13	19	837	14	6	751	7

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1225	1656	379	1272	1652	426	758	0	0	851	0	0
Stage 1	767	767	-	882	882	-	-	-	-	-	-	-
Stage 2	458	889	-	390	770	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	7.2	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.45	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	137	99	583	127	100	582	862	-	-	796	-	-
Stage 1	365	414	-	312	367	-	-	-	-	-	-	-
Stage 2	557	364	-	611	413	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	129	96	583	109	97	582	862	-	-	796	-	-
Mov Cap-2 Maneuver	129	96	-	109	97	-	-	-	-	-	-	-
Stage 1	357	411	-	305	359	-	-	-	-	-	-	-
Stage 2	530	356	-	547	410	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26	34.6	0.2	0.1
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	862	-	-	250	155	796	-
HCM Lane V/C Ratio	0.022	-	-	0.32	0.217	0.008	-
HCM Control Delay (s)	9.3	-	-	26	34.6	9.6	-
HCM Lane LOS	A	-	-	D	D	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.3	0.8	0	-

Intersection						
Int Delay, s/veh	3.9					
Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	35	44	446	61	178	420
Future Vol, veh/h	35	44	446	61	178	420
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	85	85	85	85	85	85
Heavy Vehicles, %	4	2	6	2	2	4
Mvmt Flow	41	52	525	72	209	494

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1226	299	0	0	597
Stage 1	561	-	-	-	-
Stage 2	665	-	-	-	-
Critical Hdwy	6.88	6.94	-	-	4.14
Critical Hdwy Stg 1	5.88	-	-	-	-
Critical Hdwy Stg 2	5.88	-	-	-	-
Follow-up Hdwy	3.54	3.32	-	-	2.22
Pot Cap-1 Maneuver	168	697	-	-	976
Stage 1	529	-	-	-	-
Stage 2	468	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	118	697	-	-	976
Mov Cap-2 Maneuver	118	-	-	-	-
Stage 1	373	-	-	-	-
Stage 2	468	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	32.8	0	3.4
HCM LOS	D		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	220	976	-
HCM Lane V/C Ratio	-	-	0.422	0.215	-
HCM Control Delay (s)	-	-	32.8	9.7	0.8
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	2	0.8	-

HCM 6th TWSC  
 15: Oakwood Dr & SE 69th St/E 530 Rd

01/28/2020

Intersection												
Int Delay, s/veh	6.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	16	6	1	184	20	5	1	31	68	6	59	11
Future Vol, veh/h	16	6	1	184	20	5	1	31	68	6	59	11
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	-	-	-	300	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	19	7	1	216	24	6	1	36	80	7	69	13

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	183	208	76	172	174	76	82	0	0	116	0	0
Stage 1	90	90	-	78	78	-	-	-	-	-	-	-
Stage 2	93	118	-	94	96	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	783	692	991	796	723	991	1528	-	-	1485	-	-
Stage 1	922	824	-	936	834	-	-	-	-	-	-	-
Stage 2	919	802	-	918	819	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	756	688	991	785	719	991	1528	-	-	1485	-	-
Mov Cap-2 Maneuver	756	688	-	785	719	-	-	-	-	-	-	-
Stage 1	921	820	-	935	833	-	-	-	-	-	-	-
Stage 2	887	801	-	904	815	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10		11.1		0.1		0.6	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1528	-	-	744	785	761	1485	-	-
HCM Lane V/C Ratio	0.001	-	-	0.036	0.276	0.039	0.005	-	-
HCM Control Delay (s)	7.4	0	-	10	11.3	9.9	7.4	0	-
HCM Lane LOS	A	A	-	B	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	1.1	0.1	0	-	-

Intersection						
Int Delay, s/veh	2.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↘	
Traffic Vol, veh/h	313	159	104	400	38	44
Future Vol, veh/h	313	159	104	400	38	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	500	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	6	2	2	4	4	2
Mvmt Flow	368	187	122	471	45	52

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	555	0	942
Stage 1	-	-	-	-	462
Stage 2	-	-	-	-	480
Critical Hdwy	-	-	4.14	-	6.88
Critical Hdwy Stg 1	-	-	-	-	5.88
Critical Hdwy Stg 2	-	-	-	-	5.88
Follow-up Hdwy	-	-	2.22	-	3.54
Pot Cap-1 Maneuver	-	-	1011	-	258
Stage 1	-	-	-	-	595
Stage 2	-	-	-	-	582
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1011	-	227
Mov Cap-2 Maneuver	-	-	-	-	326
Stage 1	-	-	-	-	523
Stage 2	-	-	-	-	582

Approach	EB	WB	NB
HCM Control Delay, s	0	1.9	14.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	461	-	-	1011	-
HCM Lane V/C Ratio	0.209	-	-	0.121	-
HCM Control Delay (s)	14.9	-	-	9.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0.4	-

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↕			↕		↖	↗	
Traffic Vol, veh/h	23	0	69	4	9	1	35	106	4	9	203	13
Future Vol, veh/h	23	0	69	4	9	1	35	106	4	9	203	13
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	150	-	-	-	-	-	-	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	14	0	0	0	0	0	0	0	0
Mvmt Flow	26	0	77	4	10	1	39	118	4	10	226	14

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	457	453	233	490	458	120	240	0	0	122	0	0
Stage 1	253	253	-	198	198	-	-	-	-	-	-	-
Stage 2	204	200	-	292	260	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.24	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.24	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.24	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.626	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	517	506	811	470	502	937	1339	-	-	1478	-	-
Stage 1	756	701	-	777	741	-	-	-	-	-	-	-
Stage 2	803	739	-	691	697	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	494	487	811	413	483	937	1339	-	-	1478	-	-
Mov Cap-2 Maneuver	494	487	-	413	483	-	-	-	-	-	-	-
Stage 1	733	696	-	753	718	-	-	-	-	-	-	-
Stage 2	766	716	-	621	692	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	10.6		12.8		1.9		0.3	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1339	-	-	494	811	476	1478	-	-
HCM Lane V/C Ratio	0.029	-	-	0.052	0.095	0.033	0.007	-	-
HCM Control Delay (s)	7.8	0	-	12.7	9.9	12.8	7.5	-	-
HCM Lane LOS	A	A	-	B	A	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.3	0.1	0	-	-

Intersection						
Int Delay, s/veh	4.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	14	46	59	16	45	45
Future Vol, veh/h	14	46	59	16	45	45
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	82	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	16	56	69	19	53	53
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	88	0	-	0	167	79
Stage 1	-	-	-	-	79	-
Stage 2	-	-	-	-	88	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1520	-	-	-	828	987
Stage 1	-	-	-	-	949	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1520	-	-	-	819	987
Mov Cap-2 Maneuver	-	-	-	-	799	-
Stage 1	-	-	-	-	939	-
Stage 2	-	-	-	-	940	-
Approach	EB	WB	SB			
HCM Control Delay, s	1.7	0	9.4			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1520	-	-	-	799	987
HCM Lane V/C Ratio	0.011	-	-	-	0.066	0.054
HCM Control Delay (s)	7.4	0	-	-	9.8	8.9
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2	0.2

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	3	63	199	2	1	0
Future Vol, veh/h	3	63	199	2	1	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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	74	234	2	1	0

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	236	0	-	0	317 235
Stage 1	-	-	-	-	235 -
Stage 2	-	-	-	-	82 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1331	-	-	-	676 804
Stage 1	-	-	-	-	804 -
Stage 2	-	-	-	-	941 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1331	-	-	-	674 804
Mov Cap-2 Maneuver	-	-	-	-	694 -
Stage 1	-	-	-	-	802 -
Stage 2	-	-	-	-	941 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1331	-	-	-	694
HCM Lane V/C Ratio	0.003	-	-	-	0.002
HCM Control Delay (s)	7.7	0	-	-	10.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0



Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	7	66	199	0	0	5
Future Vol, veh/h	7	66	199	0	0	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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	78	234	0	0	6

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	234	0	-	0	328 234
Stage 1	-	-	-	-	234 -
Stage 2	-	-	-	-	94 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1333	-	-	-	666 805
Stage 1	-	-	-	-	805 -
Stage 2	-	-	-	-	930 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1333	-	-	-	662 805
Mov Cap-2 Maneuver	-	-	-	-	687 -
Stage 1	-	-	-	-	800 -
Stage 2	-	-	-	-	930 -

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1333	-	-	-	-	805
HCM Lane V/C Ratio	0.006	-	-	-	-	0.007
HCM Control Delay (s)	7.7	0	-	-	0	9.5
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	-	-	0

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	5	59	198	1	0	3
Future Vol, veh/h	5	59	198	1	0	3
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	69	233	1	0	4

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	234	0	-	0	315 234
Stage 1	-	-	-	-	234 -
Stage 2	-	-	-	-	81 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1333	-	-	-	678 805
Stage 1	-	-	-	-	805 -
Stage 2	-	-	-	-	942 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1333	-	-	-	675 805
Mov Cap-2 Maneuver	-	-	-	-	694 -
Stage 1	-	-	-	-	801 -
Stage 2	-	-	-	-	942 -

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1333	-	-	-	805
HCM Lane V/C Ratio	0.004	-	-	-	0.004
HCM Control Delay (s)	7.7	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	2	57	197	1	0	2
Future Vol, veh/h	2	57	197	1	0	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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	67	232	1	0	2

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	233	0	0	304	233
Stage 1	-	-	-	233	-
Stage 2	-	-	-	71	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1335	-	-	688	806
Stage 1	-	-	-	806	-
Stage 2	-	-	-	952	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1335	-	-	687	806
Mov Cap-2 Maneuver	-	-	-	701	-
Stage 1	-	-	-	804	-
Stage 2	-	-	-	952	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1335	-	-	-	806
HCM Lane V/C Ratio	0.002	-	-	-	0.003
HCM Control Delay (s)	7.7	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

**Intersection**

Int Delay, s/veh 3.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	20	37	114	8	10	84
Future Vol, veh/h	20	37	114	8	10	84
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	44	134	9	12	99

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	143	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1440	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1440	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1440	-	-	-	745	909
HCM Lane V/C Ratio	0.016	-	-	-	0.016	0.109
HCM Control Delay (s)	7.5	0	-	-	9.9	9.4
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0	0.4

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	2	45	120	1	0	2
Future Vol, veh/h	2	45	120	1	0	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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	53	141	1	0	2

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	142	0	0	199	142
Stage 1	-	-	-	142	-
Stage 2	-	-	-	57	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	1441	-	-	790	906
Stage 1	-	-	-	885	-
Stage 2	-	-	-	966	-
Platoon blocked, %		-	-		
Mov Cap-1 Maneuver	1441	-	-	789	906
Mov Cap-2 Maneuver	-	-	-	777	-
Stage 1	-	-	-	884	-
Stage 2	-	-	-	966	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1441	-	-	-	906
HCM Lane V/C Ratio	0.002	-	-	-	0.003
HCM Control Delay (s)	7.5	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	7	38	95	9	22	26
Future Vol, veh/h	7	38	95	9	22	26
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	45	112	11	26	31

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	123	0	-	0	179 118
Stage 1	-	-	-	-	118 -
Stage 2	-	-	-	-	61 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1464	-	-	-	811 934
Stage 1	-	-	-	-	907 -
Stage 2	-	-	-	-	962 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1464	-	-	-	806 934
Mov Cap-2 Maneuver	-	-	-	-	789 -
Stage 1	-	-	-	-	902 -
Stage 2	-	-	-	-	962 -

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1464	-	-	-	861
HCM Lane V/C Ratio	0.006	-	-	-	0.066
HCM Control Delay (s)	7.5	0	-	-	9.5
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑	↘		↙	
Traffic Vol, veh/h	7	73	204	0	0	5
Future Vol, veh/h	7	73	204	0	0	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	75	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	86	240	0	0	6

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	240	0	-	0	342 240
Stage 1	-	-	-	-	240 -
Stage 2	-	-	-	-	102 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1327	-	-	-	654 799
Stage 1	-	-	-	-	800 -
Stage 2	-	-	-	-	922 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1327	-	-	-	650 799
Mov Cap-2 Maneuver	-	-	-	-	679 -
Stage 1	-	-	-	-	795 -
Stage 2	-	-	-	-	922 -

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1327	-	-	-	799
HCM Lane V/C Ratio	0.006	-	-	-	0.007
HCM Control Delay (s)	7.7	-	-	-	9.5
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

# HCM 6th Signalized Intersection Summary

## 1: US-69 & SH-69A

01/28/2020



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔	↔↔	↑↑	↔	↔↔	↑↑
Traffic Volume (veh/h)	434	708	713	230	330	620
Future Volume (veh/h)	434	708	713	230	330	620
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	1811	1856	1589	1841	1796	1574
Adj Flow Rate, veh/h	457	745	751	242	347	653
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	6	3	21	4	7	22
Cap, veh/h	993	821	1021	527	465	1654
Arrive On Green	0.30	0.30	0.34	0.34	0.14	0.55
Sat Flow, veh/h	3346	2768	3098	1560	3319	3069
Grp Volume(v), veh/h	457	745	751	242	347	653
Grp Sat Flow(s),veh/h/ln	1673	1384	1509	1560	1659	1495
Q Serve(g_s), s	6.7	15.5	13.2	7.3	6.0	7.5
Cycle Q Clear(g_c), s	6.7	15.5	13.2	7.3	6.0	7.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	993	821	1021	527	465	1654
V/C Ratio(X)	0.46	0.91	0.74	0.46	0.75	0.39
Avail Cap(c_a), veh/h	1004	830	1021	527	636	1654
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	17.2	20.3	17.5	15.6	24.8	7.7
Incr Delay (d2), s/veh	0.3	13.5	4.7	2.9	3.2	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	5.5	4.2	2.4	2.2	1.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.5	33.8	22.2	18.4	28.0	8.4
LnGrp LOS	B	C	C	B	C	A
Approach Vol, veh/h	1202		993			1000
Approach Delay, s/veh	27.6		21.3			15.2
Approach LOS	C		C			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	12.9	24.8			37.7	22.3
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	11.5	17.0			33.0	18.0
Max Q Clear Time (g_c+I1), s	8.0	15.2			9.5	17.5
Green Ext Time (p_c), s	0.4	1.0			3.9	0.3

### Intersection Summary

HCM 6th Ctrl Delay	21.8
HCM 6th LOS	C

### Notes

User approved pedestrian interval to be less than phase max green.



# HCM 6th Signalized Intersection Summary

## 14: SH-69A & Oakwood Dr

01/28/2020



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↖	↑↑	↗		↙	↘	
Traffic Volume (veh/h)	314	304	684	98	60	281	
Future Volume (veh/h)	314	304	684	98	60	281	
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	1900	1841	1811	1811	1870	1796	
Adj Flow Rate, veh/h	369	358	805	115	71	331	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	
Percent Heavy Veh, %	0	4	6	6	2	7	
Cap, veh/h	425	1801	837	120	617	528	
Arrive On Green	0.17	0.52	0.28	0.28	0.35	0.35	
Sat Flow, veh/h	1810	3589	3113	432	1781	1522	
Grp Volume(v), veh/h	369	358	458	462	71	331	
Grp Sat Flow(s),veh/h/ln	1810	1749	1721	1733	1781	1522	
Q Serve(g_s), s	8.7	3.6	17.1	17.1	1.8	11.8	
Cycle Q Clear(g_c), s	8.7	3.6	17.1	17.1	1.8	11.8	
Prop In Lane	1.00			0.25	1.00	1.00	
Lane Grp Cap(c), veh/h	425	1801	476	480	617	528	
V/C Ratio(X)	0.87	0.20	0.96	0.96	0.12	0.63	
Avail Cap(c_a), veh/h	482	1910	476	480	617	528	
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	14.3	8.5	23.2	23.2	14.5	17.7	
Incr Delay (d2), s/veh	14.2	0.1	31.5	31.4	0.4	5.6	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	4.2	1.0	9.8	9.9	0.7	10.7	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	28.5	8.6	54.7	54.6	14.8	23.3	
LnGrp LOS	C	A	D	D	B	C	
Approach Vol, veh/h		727	920		402		
Approach Delay, s/veh		18.7	54.7		21.8		
Approach LOS		B	D		C		
Timer - Assigned Phs				4	6	7	8
Phs Duration (G+Y+Rc), s				38.0	27.0	15.5	22.5
Change Period (Y+Rc), s				4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s				35.5	20.5	13.0	18.0
Max Q Clear Time (g_c+I1), s				5.6	13.8	10.7	19.1
Green Ext Time (p_c), s				2.0	0.8	0.3	0.0

### Intersection Summary

HCM 6th Ctrl Delay	35.4
HCM 6th LOS	D

### Notes

User approved pedestrian interval to be less than phase max green.

# HCM 6th Signalized Intersection Summary

## 21: Zarrow St & SH-69A

01/28/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	217	240	1	4	280	154	31	39	81	81	12	81
Future Volume (veh/h)	217	240	1	4	280	154	31	39	81	81	12	81
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	1900	1767	1767	1900	1781	1781	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	241	267	1	4	311	171	34	43	90	90	13	90
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	0	9	9	0	8	8	0	0	0	0	0	0
Cap, veh/h	486	1220	5	419	476	256	234	71	148	214	25	170
Arrive On Green	0.14	0.36	0.36	0.01	0.22	0.22	0.13	0.13	0.13	0.12	0.12	0.12
Sat Flow, veh/h	1810	3430	13	1810	2126	1142	1810	548	1146	1810	207	1435
Grp Volume(v), veh/h	241	131	137	4	246	236	34	0	133	90	0	103
Grp Sat Flow(s),veh/h/ln	1810	1678	1764	1810	1692	1576	1810	0	1694	1810	0	1642
Q Serve(g_s), s	4.2	2.5	2.5	0.1	6.1	6.3	0.8	0.0	3.4	2.1	0.0	2.7
Cycle Q Clear(g_c), s	4.2	2.5	2.5	0.1	6.1	6.3	0.8	0.0	3.4	2.1	0.0	2.7
Prop In Lane	1.00		0.01	1.00		0.72	1.00		0.68	1.00		0.87
Lane Grp Cap(c), veh/h	486	597	628	419	379	353	234	0	219	214	0	195
V/C Ratio(X)	0.50	0.22	0.22	0.01	0.65	0.67	0.15	0.00	0.61	0.42	0.00	0.53
Avail Cap(c_a), veh/h	808	1039	1093	626	717	668	609	0	570	885	0	803
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	10.4	10.4	10.4	13.7	16.2	16.3	17.8	0.0	18.9	18.8	0.0	19.1
Incr Delay (d2), s/veh	0.8	0.2	0.2	0.0	1.9	2.2	0.3	0.0	2.7	1.3	0.0	2.2
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	1.2	0.7	0.7	0.0	2.0	2.0	0.3	0.0	1.4	0.9	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.2	10.5	10.5	13.7	18.1	18.5	18.1	0.0	21.7	20.1	0.0	21.3
LnGrp LOS	B	B	B	B	B	B	B	A	C	C	A	C
Approach Vol, veh/h		509			486			167				193
Approach Delay, s/veh		10.9			18.2			20.9				20.8
Approach LOS		B			B			C				C
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		10.4	4.7	20.9		10.0	10.8	14.8				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		15.5	5.5	28.5		22.5	14.5	19.5				
Max Q Clear Time (g_c+I1), s		5.4	2.1	4.5		4.7	6.2	8.3				
Green Ext Time (p_c), s		0.5	0.0	1.3		0.7	0.4	2.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				16.2								
HCM 6th LOS				B								
<b>Notes</b>												
User approved pedestrian interval to be less than phase max green.												

HCM 6th TWSC  
4: US-69 & SE 69th St

01/28/2020

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	12	1	18	6	4	12	73	1293	55	12	926	18
Future Vol, veh/h	12	1	18	6	4	12	73	1293	55	12	926	18
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	-	-	-	-	-	-	100	-	-	120	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	15	0	0	0	0	17	5	0	20	0
Mvmt Flow	13	1	19	6	4	13	77	1361	58	13	975	19

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1848	2584	497	2058	2564	710	994	0	0	1419	0	0
Stage 1	1011	1011	-	1544	1544	-	-	-	-	-	-	-
Stage 2	837	1573	-	514	1020	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	7.2	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.45	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	47	26	485	33	27	381	704	-	-	486	-	-
Stage 1	260	320	-	122	178	-	-	-	-	-	-	-
Stage 2	332	172	-	517	317	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	35	23	485	27	23	381	704	-	-	486	-	-
Mov Cap-2 Maneuver	35	23	-	27	23	-	-	-	-	-	-	-
Stage 1	232	311	-	109	159	-	-	-	-	-	-	-
Stage 2	278	153	-	482	308	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	89.3		124.5		0.6		0.2	
HCM LOS	F		F					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	704	-	-	73	51	486	-
HCM Lane V/C Ratio	0.109	-	-	0.447	0.454	0.026	-
HCM Control Delay (s)	10.7	-	-	89.3	124.5	12.6	-
HCM Lane LOS	B	-	-	F	F	B	-
HCM 95th %tile Q(veh)	0.4	-	-	1.8	1.7	0.1	-

Intersection						
Int Delay, s/veh	39.3					
Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations						
Traffic Vol, veh/h	171	63	554	2	25	940
Future Vol, veh/h	171	63	554	2	25	940
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	85	85	85	85	85	85
Heavy Vehicles, %	4	2	6	2	2	4
Mvmt Flow	201	74	652	2	29	1106

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1264	327	0	0	654	0
Stage 1	653	-	-	-	-	-
Stage 2	611	-	-	-	-	-
Critical Hdwy	6.88	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.88	-	-	-	-	-
Critical Hdwy Stg 2	5.88	-	-	-	-	-
Follow-up Hdwy	3.54	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	~ 159	669	-	-	929	-
Stage 1	474	-	-	-	-	-
Stage 2	499	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	~ 146	669	-	-	929	-
Mov Cap-2 Maneuver	~ 146	-	-	-	-	-
Stage 1	436	-	-	-	-	-
Stage 2	499	-	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	292.7	0	0.5
HCM LOS	F		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	185	929	-
HCM Lane V/C Ratio	-	-	1.488	0.032	-
HCM Control Delay (s)	-	-	292.7	9	0.3
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	17.3	0.1	-

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

HCM 6th TWSC  
 15: Oakwood Dr & SE 69th St/E 530 Rd

01/28/2020

Intersection												
Int Delay, s/veh	7.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕			↕			↕	
Traffic Vol, veh/h	61	6	1	275	20	6	1	98	313	6	65	1
Future Vol, veh/h	61	6	1	275	20	6	1	98	313	6	65	1
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	-	-	-	300	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	72	7	1	324	24	7	1	115	368	7	76	1

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	408	576	77	396	392	299	77	0	0	483	0	0
Stage 1	91	91	-	301	301	-	-	-	-	-	-	-
Stage 2	317	485	-	95	91	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	557	431	990	568	547	745	1535	-	-	1090	-	-
Stage 1	921	823	-	712	669	-	-	-	-	-	-	-
Stage 2	698	555	-	917	823	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	530	428	990	557	543	745	1535	-	-	1090	-	-
Mov Cap-2 Maneuver	530	428	-	557	543	-	-	-	-	-	-	-
Stage 1	920	817	-	711	668	-	-	-	-	-	-	-
Stage 2	666	554	-	902	817	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	13.1		19.3		0		0.7	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1535	-	-	523	557	579	1090	-	-
HCM Lane V/C Ratio	0.001	-	-	0.153	0.581	0.053	0.006	-	-
HCM Control Delay (s)	7.3	0	-	13.1	20	11.6	8.3	0	-
HCM Lane LOS	A	A	-	B	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	3.7	0.2	0	-	-

Intersection						
Int Delay, s/veh	20.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↘	
Traffic Vol, veh/h	329	35	28	478	304	108
Future Vol, veh/h	329	35	28	478	304	108
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	500	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	6	2	2	4	4	2
Mvmt Flow	387	41	33	562	358	127

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	428	0	755
Stage 1	-	-	-	-	408
Stage 2	-	-	-	-	347
Critical Hdwy	-	-	4.14	-	6.88
Critical Hdwy Stg 1	-	-	-	-	5.88
Critical Hdwy Stg 2	-	-	-	-	5.88
Follow-up Hdwy	-	-	2.22	-	3.54
Pot Cap-1 Maneuver	-	-	1128	-	~ 340
Stage 1	-	-	-	-	634
Stage 2	-	-	-	-	681
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1128	-	~ 330
Mov Cap-2 Maneuver	-	-	-	-	439
Stage 1	-	-	-	-	616
Stage 2	-	-	-	-	681

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	63.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	497	-	-	1128	-
HCM Lane V/C Ratio	0.975	-	-	0.029	-
HCM Control Delay (s)	63.3	-	-	8.3	-
HCM Lane LOS	F	-	-	A	-
HCM 95th %tile Q(veh)	12.7	-	-	0.1	-

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

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	4	74	7	5	5	116	265	3	7	93	31
Future Vol, veh/h	26	4	74	7	5	5	116	265	3	7	93	31
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	150	-	-	-	-	-	-	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	0	14	0	0	0	0	0	0	0	0
Mvmt Flow	29	4	82	8	6	6	129	294	3	8	103	34

Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	696	691	120	733	707	296	137	0	0	297	0	0
Stage 1	136	136	-	554	554	-	-	-	-	-	-	-
Stage 2	560	555	-	179	153	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.24	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.24	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.24	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.626	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	359	370	937	321	363	748	1459	-	-	1276	-	-
Stage 1	872	788	-	496	517	-	-	-	-	-	-	-
Stage 2	516	516	-	796	775	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	322	329	937	265	323	748	1459	-	-	1276	-	-
Mov Cap-2 Maneuver	322	329	-	265	323	-	-	-	-	-	-	-
Stage 1	780	783	-	443	462	-	-	-	-	-	-	-
Stage 2	452	461	-	718	770	-	-	-	-	-	-	-

Approach	EB		WB			NB			SB		
HCM Control Delay, s	11.6		15.9			2.3			0.4		
HCM LOS	B		C								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1459	-	-	322	856	350	1276	-	-
HCM Lane V/C Ratio	0.088	-	-	0.09	0.101	0.054	0.006	-	-
HCM Control Delay (s)	7.7	0	-	17.3	9.7	15.9	7.8	-	-
HCM Lane LOS	A	A	-	C	A	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.3	0.3	0.2	0	-	-

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	↔
Traffic Vol, veh/h	46	66	117	55	35	24
Future Vol, veh/h	46	66	117	55	35	24
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	54	78	138	65	41	28

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	203	0	-	0	357 171
Stage 1	-	-	-	-	171 -
Stage 2	-	-	-	-	186 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1381	-	-	-	645 878
Stage 1	-	-	-	-	864 -
Stage 2	-	-	-	-	851 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1381	-	-	-	619 878
Mov Cap-2 Maneuver	-	-	-	-	653 -
Stage 1	-	-	-	-	829 -
Stage 2	-	-	-	-	851 -

Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1381	-	-	-	653	878
HCM Lane V/C Ratio	0.039	-	-	-	0.063	0.032
HCM Control Delay (s)	7.7	0	-	-	10.9	9.2
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	0.1



Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	13	220	187	9	5	14
Future Vol, veh/h	13	220	187	9	5	14
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	259	220	11	6	16

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	231	0	-	0	515 226
Stage 1	-	-	-	-	226 -
Stage 2	-	-	-	-	289 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1337	-	-	-	520 813
Stage 1	-	-	-	-	812 -
Stage 2	-	-	-	-	760 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1337	-	-	-	513 813
Mov Cap-2 Maneuver	-	-	-	-	586 -
Stage 1	-	-	-	-	801 -
Stage 2	-	-	-	-	760 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1337	-	-	-	738
HCM Lane V/C Ratio	0.011	-	-	-	0.03
HCM Control Delay (s)	7.7	0	-	-	10
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	46	233	201	0	0	50
Future Vol, veh/h	46	233	201	0	0	50
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	274	236	0	0	59

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	236	0	-	0	618 236
Stage 1	-	-	-	-	236 -
Stage 2	-	-	-	-	382 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1331	-	-	-	453 803
Stage 1	-	-	-	-	803 -
Stage 2	-	-	-	-	690 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1331	-	-	-	431 803
Mov Cap-2 Maneuver	-	-	-	-	509 -
Stage 1	-	-	-	-	764 -
Stage 2	-	-	-	-	690 -

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1331	-	-	-	-	803
HCM Lane V/C Ratio	0.041	-	-	-	-	0.073
HCM Control Delay (s)	7.8	0	-	-	0	9.8
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.2

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	34	191	160	6	6	36
Future Vol, veh/h	34	191	160	6	6	36
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	225	188	7	7	42

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	195	0	-	0	497 192
Stage 1	-	-	-	-	192 -
Stage 2	-	-	-	-	305 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1378	-	-	-	532 850
Stage 1	-	-	-	-	841 -
Stage 2	-	-	-	-	748 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1378	-	-	-	514 850
Mov Cap-2 Maneuver	-	-	-	-	577 -
Stage 1	-	-	-	-	813 -
Stage 2	-	-	-	-	748 -

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1378	-	-	-	796
HCM Lane V/C Ratio	0.029	-	-	-	0.062
HCM Control Delay (s)	7.7	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	17	180	148	3	4	18
Future Vol, veh/h	17	180	148	3	4	18
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	212	174	4	5	21

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	178	0	-	0	428 176
Stage 1	-	-	-	-	176 -
Stage 2	-	-	-	-	252 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1398	-	-	-	584 867
Stage 1	-	-	-	-	855 -
Stage 2	-	-	-	-	790 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1398	-	-	-	575 867
Mov Cap-2 Maneuver	-	-	-	-	628 -
Stage 1	-	-	-	-	841 -
Stage 2	-	-	-	-	790 -

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1398	-	-	-	811
HCM Lane V/C Ratio	0.014	-	-	-	0.032
HCM Control Delay (s)	7.6	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	68	116	115	28	19	36
Future Vol, veh/h	68	116	115	28	19	36
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	80	136	135	33	22	42

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	168	0	-	0	448 152
Stage 1	-	-	-	-	152 -
Stage 2	-	-	-	-	296 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1410	-	-	-	568 894
Stage 1	-	-	-	-	876 -
Stage 2	-	-	-	-	755 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1410	-	-	-	533 894
Mov Cap-2 Maneuver	-	-	-	-	574 -
Stage 1	-	-	-	-	823 -
Stage 2	-	-	-	-	755 -

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1410	-	-	-	574	894
HCM Lane V/C Ratio	0.057	-	-	-	0.039	0.047
HCM Control Delay (s)	7.7	0	-	-	11.5	9.2
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.1	0.1

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	17	118	125	3	3	18
Future Vol, veh/h	17	118	125	3	3	18
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	139	147	4	4	21

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	151	0	-	0	328 149
Stage 1	-	-	-	-	149 -
Stage 2	-	-	-	-	179 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1430	-	-	-	666 898
Stage 1	-	-	-	-	879 -
Stage 2	-	-	-	-	852 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1430	-	-	-	656 898
Mov Cap-2 Maneuver	-	-	-	-	686 -
Stage 1	-	-	-	-	866 -
Stage 2	-	-	-	-	852 -

Approach	EB	WB	SB
HCM Control Delay, s	1	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1430	-	-	-	860
HCM Lane V/C Ratio	0.014	-	-	-	0.029
HCM Control Delay (s)	7.6	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	24	97	111	30	15	17
Future Vol, veh/h	24	97	111	30	15	17
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	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	114	131	35	18	20

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	166	0	-	0	319 149
Stage 1	-	-	-	-	149 -
Stage 2	-	-	-	-	170 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1412	-	-	-	674 898
Stage 1	-	-	-	-	879 -
Stage 2	-	-	-	-	860 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1412	-	-	-	660 898
Mov Cap-2 Maneuver	-	-	-	-	687 -
Stage 1	-	-	-	-	861 -
Stage 2	-	-	-	-	860 -

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1412	-	-	-	785
HCM Lane V/C Ratio	0.02	-	-	-	0.048
HCM Control Delay (s)	7.6	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	46	279	251	0	0	50
Future Vol, veh/h	46	279	251	0	0	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	54	328	295	0	0	59

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	295	0	-	0	731 295
Stage 1	-	-	-	-	295 -
Stage 2	-	-	-	-	436 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1266	-	-	-	389 744
Stage 1	-	-	-	-	755 -
Stage 2	-	-	-	-	652 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1266	-	-	-	372 744
Mov Cap-2 Maneuver	-	-	-	-	465 -
Stage 1	-	-	-	-	723 -
Stage 2	-	-	-	-	652 -

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1266	-	-	-	744
HCM Lane V/C Ratio	0.043	-	-	-	0.079
HCM Control Delay (s)	8	-	-	-	10.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3



**TRAFFIC IMPACT STUDY –  
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MIXED USE DEVELOPMENT**

Oklahoma Ordinance Works Authority

January 2020 (Final Study)

Project No. 019-0719

