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Traffic. Transportation Planning. Parking. Design.

TRAFFIC IMPACT ANALYSIS FOR

LAKES OF AURORA ESTATES RESIDENTIAL DEVELOPMENT

AURORA, TEXAS

DeShazo Project No. 15172

Prepared for:

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Prepared by:

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STATE OF TEXAS
CHANDRAKANTH MURUGANANDHAM
102281
LICENSED
PROFESSIONAL ENGINEER

M. Chandrakanth

October 5, 2015

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EXECUTIVE SUMMARY

The services of **DeShazo Group, Inc.** (DeShazo) were retained by **TCCI Land Development, Inc.,** to conduct a traffic impact analysis (TIA) for the proposed *Lakes of Aurora Estates Development* (the "Project") located in Aurora, Texas. The Project will consist of a total of 442 single-family residential homes and is estimated to be fully built by year 2025. The Project site includes multiple tracts that are mostly vacant with a lake in the middle of the property. A zoning change to SF-6-R (Single Family Residential Development) is requested for which site plan approval is required as part of the Project's approval process.

The purpose of this report is to summarize the traffic operational characteristics within a specific study area and to measure the projected incremental impact related to the Project along with the background conditions as determined by standardized engineering analyses. The study parameters used in this TIA are based upon the requirements of the City of Aurora and TxDOT-Fort Worth (Wise County) and are consistent with the standard industry practices used in similar studies.

The following findings and recommendations are based upon the proposed buildout of the development in accordance with the development scenario outlined in the *Project Description* section of this report.

1) ***The overall projected site development at buildout year 2025 will generate 319 AM trips and 400 PM trips during the peak hours.***
2) ***The existing F.M. 718/S.H. 114 intersection currently operates at an acceptable LOS, a condition that will be maintained throughout the site buildout conditions.***
3) ***Site Driveway 1 at F.M. 718 meets TxDOT's access spacing requirements.***
4) ***A right-turn deceleration lane is warranted for site driveway 1 on FM 718 by year 2025.***
5) ***A left-turn deceleration is warranted at site driveway 1 by year 2025 Buildout and needs to be provided prior to the 2030 Horizon Year Site Buildout.***
6) ***Left-turn lanes are currently provided at the Old Base Road and at F.M. 718 intersections with S.H. 114 which provide adequate storage for vehicles turning left toward the site from S.H.114.***
7) ***Overall, the proposed Lakes of Aurora Estates residential development, with a total of 442 single-family homes, will not generate significant traffic volumes and therefore will have only a minimal impact in the vicinity of site.***

The existing roadway system can adequately accommodate the projected, site-generated traffic with the minimal, above-referenced mitigation measures.

END

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Technical Memorandum

To: Mr. Pat Atkins – Director of Land Development and Acquisitions
TCCI Land Development, Inc.

From: DeShazo Group, Inc.

Date: October 5, 2015

Re: **A Traffic Impact Analysis for Lakes of Aurora Estates, a Single-Family Residential Development in Aurora, Texas**
(DeShazo #15172)

Introduction

DeShazo Group, Inc., is an engineering consulting firm providing licensed engineers skilled in the field of traffic and transportation engineering. The services of DeShazo Group were retained by **TCCI Land Development, Inc.,** to conduct a traffic impact analysis for the proposed *Lakes of Aurora Estates development* located in Aurora, Texas (see **Exhibit 1**).

This study examined the potential traffic generated by the proposed development plan and determined the general availability of access and roadway capacity available to serve it for the following scenarios.

- Existing Conditions (2015)
- Project Background (2025) – no build condition
- Project Buildout (2025) – with site development
- Project Horizon (2030) – with and without site development

Once completed, this report will be provided to City of Aurora staff and TxDOT - Fort Worth District (Wise County) for their review and to fulfill the associated requirements of the local approval process.

Proposed Development Characteristics

This proposed development consists of 442 single family estate lots on approximately 184.81 acres. The latest site plan (shown in **Exhibit 2**) reflects only 396 single-family units; however, the analysis is based upon the original 442 dwelling units to provide a more conservative analysis. The Project is planned to be fully built out by year 2025. A zoning change to SF-6-R (Single Family Residential) is requested. **Exhibit 2** offers a conceptual site plan and shows the proposed access for the Project, which is planned to have five driveways that are shown to tie into F.M. 718, Van Meter Drive, Old Base Road and Bennett Drive.

Roadways and Accessibility

The following existing roadways will provide primary access to the subject site and are included in the study area.

- **F.M. 718 (TxDOT Roadway)**
  A two-lane, undivided roadway with additional turn lanes at major intersections/driveways at E. Old Base Road and at Timber Lake Place. Posted speed limit near the site is 60 mph.
- **S.H. 114 (TxDOT Roadway)**
  A three-lane, undivided roadway with a continuous center, two-way, left turn lane. Posted speed limit near the site is 55 mph.
- **Old Base Road**
  A two-lane, undivided, north/south roadway located east of the site. The posted speed limit on Old Base Road near the site is 30 mph, and 45 mph south of Van Meter Drive.
- **Van Meter Drive**
  A two-lane, undivided, east/west roadway located south of the site. There is no posted speed limit near the site; assumed to be 30 mph.
- **Bennett Drive**
  A two-lane, undivided, east/west roadway located north of site and west of Old Base Road. The posted speed limit is 30 mph.

The following intersections were also included in the impact analysis.

- **S.H. 114 at F.M. 718** *(Traffic Signal controlled)*
- **S.H. 114 at Old Base Road** *(STOP Control on Old Base Road)*
- **F.M. 718 at Van Meter Drive** *(STOP Control on Van Meter Drive)*
- **Old Base Road at Van Meter Drive** *(STOP Control on Van Meter Drive)*
- **Old Base Road at Bennett Drive** *(STOP Control on Bennett Drive)*
- **Proposed Site Driveways**

Traffic Volumes

The findings presented in this report analyzed the operational conditions for the peak hours and study area as defined above using standardized analytical methodologies where applicable. It examined current traffic conditions, future background traffic conditions and future traffic conditions with the proposed Project fully developed and operational. Once current traffic information was collected, future background volumes were projected by applying an annual growth rate to the existing count data. The traffic generated by the proposed development was then projected using the standard four-step approach: Trip Generation, Mode Split, Trip Distribution and Traffic Assignment. The resulting traffic impact to operational conditions can be assessed by adding the site-generated traffic to the future background traffic from which mitigation measures may be recommended.

Existing Traffic Volumes

Existing weekday peak hour traffic volumes were collected in the study area on September 23, 2015. These volumes are shown in **Exhibits 3A - 3B**. Detailed traffic counts can be found in **Appendix A**.

Future Background Traffic Volumes

The standard procedure for determining the future background (non-site-related) traffic involves several steps. The first is to determine an average annual growth rate for the roadways in the study area. The second is to determine a buildout or horizon year for the analysis. Finally, the existing traffic volumes are factored using the assumed annual growth rate for the selected number of growth years. The traffic on F.M. 718 from 2009 to 2015 stayed relatively

flat; S.H. 114 showed a growth increase of approximately 2.5%. We assumed a **2025** buildout year and applied an average annual growth rate of three percent (3%) for the entire study area through the 2030 Horizon buildout year. Applying these factors to the current traffic volumes yields the 2025 Background and 2030 Horizon buildout volumes shown in **Exhibits 4A-4B and Exhibits 5A-5B**.

Site-Related Traffic Volumes

Trip Generation and Mode Split

Trip generation for the Project was calculated using the Institute of Transportation Engineers (ITE) *Trip Generation* manual (9th Edition). ITE *Trip Generation* is a compilation of actual traffic generation data by land use as collected over several decades by creditable sources across the country and it is accepted as the standard methodology to determine trip generation volumes for various land uses where sufficient data exists. A summary of the site-related trips calculated for the proposed building program is provided in **Table 1,** which shows the net trips added by the proposed development. The appropriate excerpts from the trip generation software are provided in **Appendix B**.

Table 1
Lakes of Aurora Estates - Trip Generation

Land Use	Quantity	Daily Traffic	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
210 – Single Family Detached	442 DU	4,122	319	80	239	400	252	148
Totals		***4,122***	***319***	***80***	***239***	***400***	***252***	***148***

Trip Distribution and Assignment

Traffic generated by the proposed development at site buildout conditions was distributed and assigned to the study area roadway network using professional judgment to interpret the traffic orientation characteristics of existing traffic volumes in the study area and a technical understanding of the available roadway network. **Exhibits 6A-6B** illustrate the approach and departure percentages assumed for site-generated traffic.

Traffic Volumes

Determination of the traffic impact associated with the Project is measured by comparing the change in operational conditions before and after site-related traffic is added to the roadway system. This involves development of traffic volumes that include both background and site-related traffic. The site-generated traffic was calculated by multiplying the trip generation values (from **Table 1**) by the corresponding traffic approach and departure orientations (**Exhibits 6A - 6B**). The resulting peak-hour, site-generated traffic volumes of the Project are summarized in **Exhibits 7A – 7B**.

Table 2. Peak Hour Intersection Capacity Analysis Results (Signalized Intersections)

Signalized Intersections	Conditions: Existing AM	Existing PM	2025 Background AM	2025 Background PM	2025 Background + Site AM	2025 Background + Site PM	2030 Background AM	2030 Background PM	2030 Background + Site AM	2030 Background + Site PM
SH-114 at										
FM 718	A *(9.5)*	B *(10.8)*	B *(10.9)*	B *(12.2)*	B *(12.5)*	B *(14.8)*	B *(12.7)*	B *(13.4)*	B *(14.3)*	B *(16.2)*

Table 3. Peak Hour Intersection Capacity Analysis Results (Unsignalized Intersections)

Unsignalized Intersections	Traffic Movement	Conditions: Existing AM	Existing PM	2025 Background AM	2025 Background PM	2025 Background + Site AM	2025 Background + Site PM	2030 Background AM	2030 Background PM	2030 Background + Site AM	2030 Background + Site PM
SH-114 at											
Old Base Road	WBL	A *(8.9)*	A *(8.3)*	A *(9.8)*	A *(8.8)*	B *(10.2)*	A *(9.1)*	B *(10.5)*	A *(9.1)*	B *(11.0)*	A *(9.6)*
	NBLR	B *(14.6)*	B *(13.7)*	C *(20.6)*	C *(18.1)*	D *(26.9)*	C *(20.8)*	D *(27.7)*	C *(22.8)*	E *(41.4)*	D *(27.7)*
Old Base Road at											
Bennet Road	EBLR	A *(8.7)*	A *(8.8)*	A *(8.7)*	A *(9.0)*	A *(9.0)*	A *(9.4)*	A *(8.8)*	A *(9.1)*	A *(9.1)*	A *(9.5)*
	NBL	A *(0.0)*	A *(7.3)*	A *(0.0)*	A *(7.4)*	A *(0.0)*	A *(7.5)*	A *(0.0)*	A *(7.4)*	A *(0.0)*	A *(7.5)*
Old Base Road at											
Van Meter Drive	EBLR	A *(8.6)*	A *(8.7)*	A *(8.7)*	A *(8.8)*	A *(8.8)*	A *(8.8)*	A *(8.7)*	A *(8.9)*	A *(8.9)*	A *(8.9)*
	NBL	A *(7.2)*	A *(0.0)*	A *(7.3)*	A *(0.0)*	A *(7.3)*	A *(7.3)*	A *(7.3)*	A *(0.0)*	A *(7.3)*	A *(7.4)*
FM 718 at											
Van Meter Drive	EBLTR	A *(9.8)*	A *(9.8)*	B *(10.6)*	B *(10.6)*	B *(12.8)*	B *(11.7)*	B *(11.2)*	B *(11.3)*	B *(12.5)*	B *(12.8)*
	WBLTR	A *(9.3)*	B *(11.8)*	A *(9.5)*	B *(13.8)*	B *(11.8)*	C *(17.6)*	B *(10.1)*	C *(15.1)*	B *(13.8)*	C *(20.3)*
	NBLTR	A *(7.6)*	A *(7.7)*	A *(7.8)*	A *(7.8)*	A *(7.9)*	A *(8.0)*	A *(7.8)*	A *(8.0)*	A *(8.0)*	A *(8.1)*
	SBLTR	A *(7.4)*	A *(7.5)*	A *(7.5)*	A *(7.6)*	A *(7.5)*	A *(8.0)*	A *(7.5)*	A *(7.7)*	A *(7.6)*	A *(8.1)*
FM 718 at											
Site Driveway 1	WBLR	- -	- -	- -	- -	B *(11.6)*	B *(12.7)*	- -	- -	B *(12.1)*	B *(13.4)*
	SBL	- -	- -	- -	- -	A *(7.6)*	A *(8.0)*	- -	- -	A *(7.6)*	A *(8.1)*
Van Meter Drive at											
Site Driveway 2	EBLT	- -	- -	- -	- -	A *(7.2)*	A *(7.3)*	- -	- -	A *(7.3)*	A *(7.3)*
	SBLR	- -	- -	- -	- -	A *(8.6)*	A *(8.7)*	- -	- -	A *(8.6)*	A *(8.7)*
Old Base Road at											
Site Driveway 3	EBLR	- -	- -	- -	- -	A *(8.9)*	A *(9.1)*	- -	- -	A *(8.9)*	A *(9.2)*
	NBLT	- -	- -	- -	- -	A *(7.3)*	A *(7.4)*	- -	- -	A *(7.3)*	A *(7.4)*
Bennet Road at											
Site Driveway 4	WBL	- -	- -	- -	- -	A *(7.3)*	A *(7.3)*	- -	- -	A *(7.3)*	A *(7.3)*
	NBLR	- -	- -	- -	- -	A *(8.5)*	A *(8.4)*	- -	- -	A *(8.5)*	A *(8.4)*

KEY:

A, B, C, D, E, F = Level-of-Service for each intersection approach
NB, SB, EB, WB = North-, South-, East-, Westbound approach
L, T, R = Left, Through, Right Approach turning movement
AM = AM Peak Hour of Adjacent Street
PM = AM Peak Hour of Adjacent Street

NOTE: Signalized intersection operational parameters and operational results were obtained directly from the optimized software output and may differ slightly from actual traffic signal operations.

Background plus Site Traffic Volumes

Adding the new site-related traffic volumes from **Exhibits 7A – 7B** to the 2025 Background traffic volumes shown in **Exhibits 4A – 4B** and 2030 Horizon traffic volumes shown in **Exhibits 5A-5B** yields the total peak period traffic volumes at the Project buildout shown **Exhibits 8A – 8B and Exhibits 9A – 9B**.

Access Assessment

The access assessment portion of this study examined the locations of the driveways, potential need for ~~a~~ turn-lane(s) and sight distances of the driveways with the existing roadway as described below.

1) The spacing between the proposed Driveway 1 and the adjacent property driveways.
2) The sight distance of the proposed Driveway 1 with the perspective of safety and visibility to/from the access from Aurora Boulevard and the adjacent public street intersections.
3) The need for acceleration/deceleration lanes based upon the projected turning movements at the proposed Driveway 1.

Access Point-to-Access Point Spacing

TxDOT controls access on F.M. 718 and the City of Aurora controls access on all other roadways within the study area. The TxDOT *Access Management Manual* indicates that if the posted speed is higher than 45 mph, the minimum distance between access connections should be 425 feet" (**See TxDOT Table 2-2 in Appendix C**). The site plan (**Exhibit 2**) shows that:

- Site Driveway 1 is proposed to be located approximately 1,400 feet from Van Meter Drive to the south and approximately 1,400 feet from the Rhett Court/F.M. 718 intersection.

Therefore, the proposed Driveway 1 distance exceeds the minimum separation requirements.

Sight Distance Criteria

A field visit to the project location found that the proposed site driveway location appears to be on a relatively flat/level terrain with F.M. 718 and appears to intersect at a 90-degree angle.

The preliminary site plan shown on Exhibit 2 meets the minimum sight distance criteria requirements.

Auxiliary Lane Assessment

This portion of this study examines the need for auxiliary or turn lanes based upon the projected turning movements at the proposed access points. Table 2-3 from TxDOT's *Access Management Manual* requires right-turn lanes for speeds greater than 45 mph. The right-turn volumes are greater than 50 vehicles per hour on F.M. 718 and S.H. 114 (see **Appendix C**). Applying these volume threshold standards to the proposed site traffic as depicted on **Exhibits 7A - 7B** shows that the projected right-turn traffic volumes on:

1) Northwest bound F.M. 718 at Driveway 1 **does** meet the volume threshold for a right-turn deceleration lane for the PM peak hour;
2) Southeast bound F.M. 718 at Driveway 1 **does** meet the volume threshold for a left-turn deceleration lane at full site buildout by the year 2030; plus
3) The projected site-generated east- and westbound traffic volumes on S.H. 114 at Old Base Road **do not** meet the requirements for a right-turn or left-turn deceleration lane.

Traffic Impact Analysis

Analysis Methodology

Traffic operational conditions for unsignalized and signalized roadway intersections are quantitatively measured in terms of average delay through the intersection per vehicle during a one-hour period as a function of roadway capacity and operational characteristics of the traffic signal. The standardized methodology applied herein was developed by the Transportation Research Board as presented in the *2010 Highway Capacity Manual (HCM)*. The *HCM* also qualitatively rates the overall delay conditions in terms of "level of service" (LOS) ranging from "A" (free-flowing conditions) to "F" (over-capacity conditions). Generally, *LOS D* or better is considered an acceptable condition for intersections in urban and suburban areas.

Summary of Results

The intersection capacity analyses presented in this study were performed using the *Synchro 9* software package. **Table 2** and **Table 3** provide a summary of the intersection operational (signalized and unsignalized) conditions during the peak periods under the analysis conditions presented previously. Detailed software output is provided in **Appendix D**. The intersection roadway geometry is shown in **Exhibit 10**. A summary of the findings provided in **Tables 2 and 3** is presented below.

1) ***The existing traffic-signal-controlled F.M. 718/S.H. 114 intersection currently operates at an acceptable LOS, a condition that is expected to continue throughout all site buildout conditions.***
2) ***The existing study area STOP-controlled intersections currently operates at an acceptable LOS during the AM and PM peak hour and is expected to maintain acceptable levels throughout site buildout years. However, the Old Base Road at S.H. 114 intersection is projected to operate at a lower LOS during the AM peak hour for the projected 2030 background year. The lower LOS approach delay is not uncommon at other similar locations.***
3) ***The proposed site driveways at F.M. 718, Van Meter Drive, Old Base Road and Bennett Drive are shown to operate at acceptable LOS during both the AM and PM peak hours.***

Roadway Link Analysis

Analysis Methodology

Roadway link analysis is a comparison of actual or forecasted traffic volumes to the theoretically optimum roadway capacity and is an evaluation technique used to validate the regional roadway network. Ideally, the comprehensive thoroughfare system is designed to provide adequate local and regional mobility while maintaining sufficient opportunities for property access without requiring excessive right-of-way. DeShazo applied planning parameters developed by the NCTCOG (parameters provided in **Tables 4** and **5**) for this study and used the projected 2025 peak period traffic volumes.

A suburban, residential-area type, the following roadway cross-sections and functional classifications were used in the analysis.

- **F.M. 718**: *two-lane, undivided Principal Arterial*
- **Old Base Road**: *two-lane, undivided Collector near the site*

A summary of the link capacity analysis is provided in **Table 6.**

Table 4

Hourly *Roadway Link Service Volumes (per lane)*

= Divided or One-Way Roads, (*####*) = Undivided Roads

Area Type	Functional Class			
	Principal Arterial	Minor Arterial	Collector	Frontage Road
CBD	725 *(650)*	725 *(650)*	475 *(425)*	725 *(650)*
Outer Business District	775 *(725)*	775 *(725)*	500 *(450)*	775 *(725)*
Urban Residential	850 *(775)*	825 *(750)*	525 *(475)*	850 *(750)*
Suburban Residential	925 *(875)*	900 *(825)*	575 *(525)*	900 *(825)*
Rural	1,025 ***(925)***	975 *(875)*	600 ***(550)***	975 *(875)*

Table 5

Roadway Link Level-of-Service Guidelines

(Derived from parameters used by North Central Texas Council of Governments)

Level of Service	NCTCOG Volume/Capacity Ratio
A/B/C	$X \leq 0.65$
D/E	$0.65 < X \leq 1$
F	$X > 1.0$

Table 6

Roadway Link Analysis

Roadway Link	Hourly Capacity per Lane	Hourly Volume				LOS			
		AM		PM		AM		PM	
		Existing	Background + Site	Existing	Background + Site	Existing	Background + Site	Existing	Background + Site
F.M. 718 adjacent to site	925	207	319	237	377	0.22 (A/B/C)	.34 (A/B/C)	0.26 (A/B/C)	.41 (A/B/C)
Old Base Road adjacent to site	550	44	111	69	223	0.08 (A/B/C)	0.20 (A/B/C)	.13 (A/B/C)	0.41 (A/B/C)

Summary of Results

The roadway link analysis presented in **Table 6** indicates the following.

- F.M. 718 will operate well below capacity within the area and operate at an acceptable level.
- Old Base Road will be well below capacity near the site and will operate efficiently.

Conclusions and Recommendations

This report examined the access and traffic impact of the Lakes of Aurora Estates Development on the adjacent roadway system. The findings are summarized below.

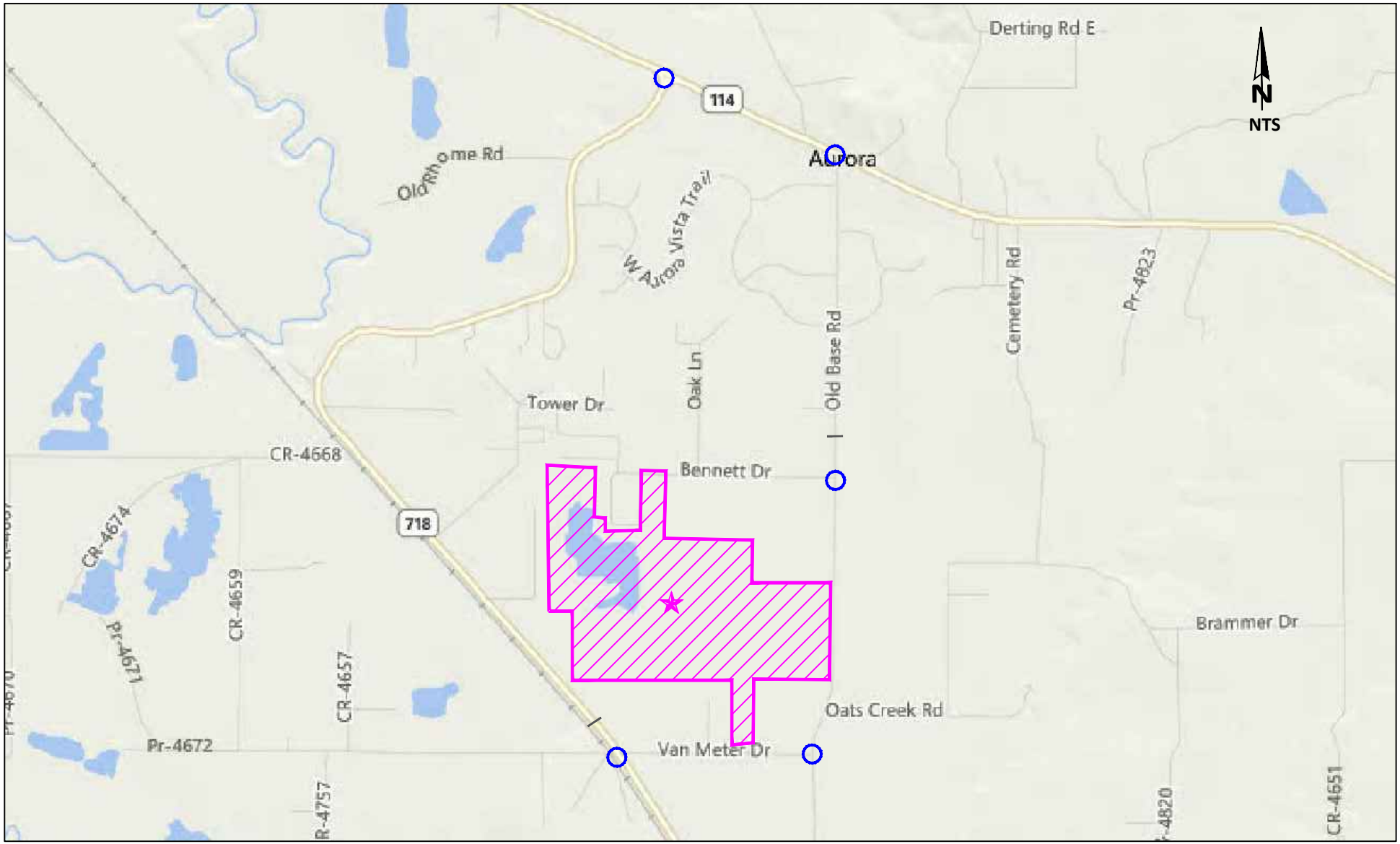
1) ***The overall projected site development at buildout year 2025 will generate 319 AM trips and 400 PM trips during the peak hours.***
2) ***The existing F.M. 718/S.H. 114 intersection currently operates at an acceptable LOS, a condition that will be maintained throughout the site buildout conditions.***
3) ***Site Driveway 1 at F.M. 718 meets TxDOT's access spacing requirements.***
4) ***A right-turn deceleration lane is warranted for site driveway 1 on FM 718 by year 2025.***
5) ***A left-turn deceleration is warranted at site driveway 1 by year 2025 Buildout and needs to be provided prior to the 2030 Horizon Year Site Buildout.***
6) ***Left-turn lanes are currently provided at the Old Base Road and at F.M. 718 intersections with S.H. 114 which provide adequate storage for vehicles turning left toward the site from S.H.114.***
7) ***Overall, the proposed Lakes of Aurora Estates residential development, with a total of 442 single-family homes, will not generate significant traffic volumes and therefore will have only a minimal impact in the vicinity of site.***

The existing roadway system can adequately accommodate the projected, site-generated traffic with the minimal, above-referenced mitigation measures.

NOTE: Recommendations for public improvements within the study area presented in this report reflect the opinion of DeShazo based solely upon technical analysis and professional judgment and are not intended to define, imply, or allocate funding sources nor required improvements. Applicable legal precedent indicates that the Owner of a Project should only be required to ***proportionately*** *fund* ***necessary*** *infrastructure improvements that are directly attributable to implementation of the Project. Such requirements will depend upon the individual circumstances of each project that may be viewed differently by each particular agency/municipality.*

END OF MEMO

DeShazo Group



LEGEND:
- Study Site
- Study Intersections
- Existing Traffic Signal
- 24-Hour Tube Counts

Site Location Map

EXHIBIT 1

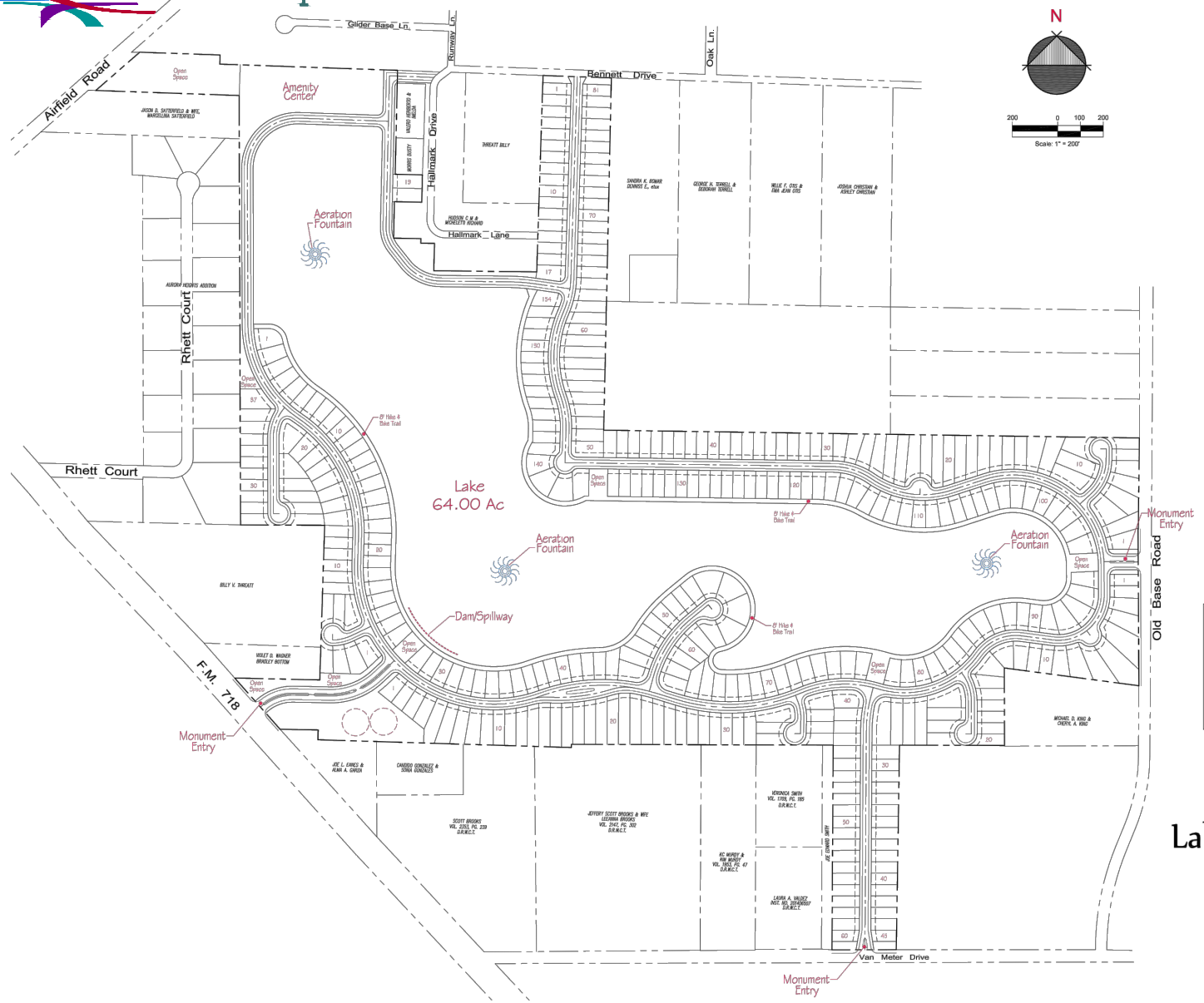
TIA for Lakes of Aurora Estates in Aurora, Texas.

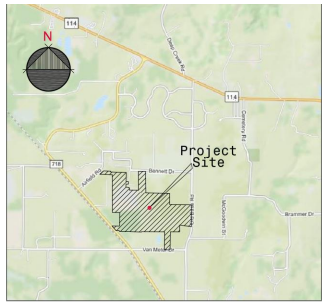
PROJECT #15172

DeShazo Group, Inc. Job No. 15172 Exhibit Created on 09-30-2015

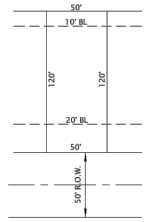
DeShazo Group, Inc. Job No. 15172 Exhibit Created on 10-01-2015

DeShazo Group





Vicinity Map
n. t. s.



TYPICAL LOT DETAIL
n. t. s.

Land Use Data

Prop. Zoning	SF-6-R
Total Area	184.18 Ac.
Min Lot Width	50'
Min. Lot Depth	120'
Min. Front B.L.	20'
Min. Rear B.L.	10'
Min. Side B.L.	5'
Min. Lot Area	6000 SF
Max. Bldg. Height	2.5 Stories/35'
Min. Lot Coverage	70%

396 Lots

CONCEPTUAL DEVELOPMENT PLAN

Lakes of Aurora Estates

City of Aurora, Wise County, Texas

Owner:
IMAGE PROPERTIES
P.O. Box 1755
Roanoke, Texas 76262
469.688.8224
Contact: Vaughn Proffitt

Engineer:
ENGINEERING CONCEPTS & DESIGN, L.P.
TBPE Firm Registration # F-2580
TBPLS Firm Registration # 10194074

Developer:
TCCI LAND DEVELOPMENT, INC.
3930 Glade Road, S. 108-322
Colleyville, Texas 76034
469.688.8224
Contact: Tommy Cansler

Surveyor:
HADDOX SURVEYING & MAPPING, INC.
P.O. Box 2109
Forney, Texas 75126
972 564.4416
Contact: Brian Maddox

October 1, 2015

Scale: 1" = 200'

NTS

Preliminary Site Plan

EXHIBIT

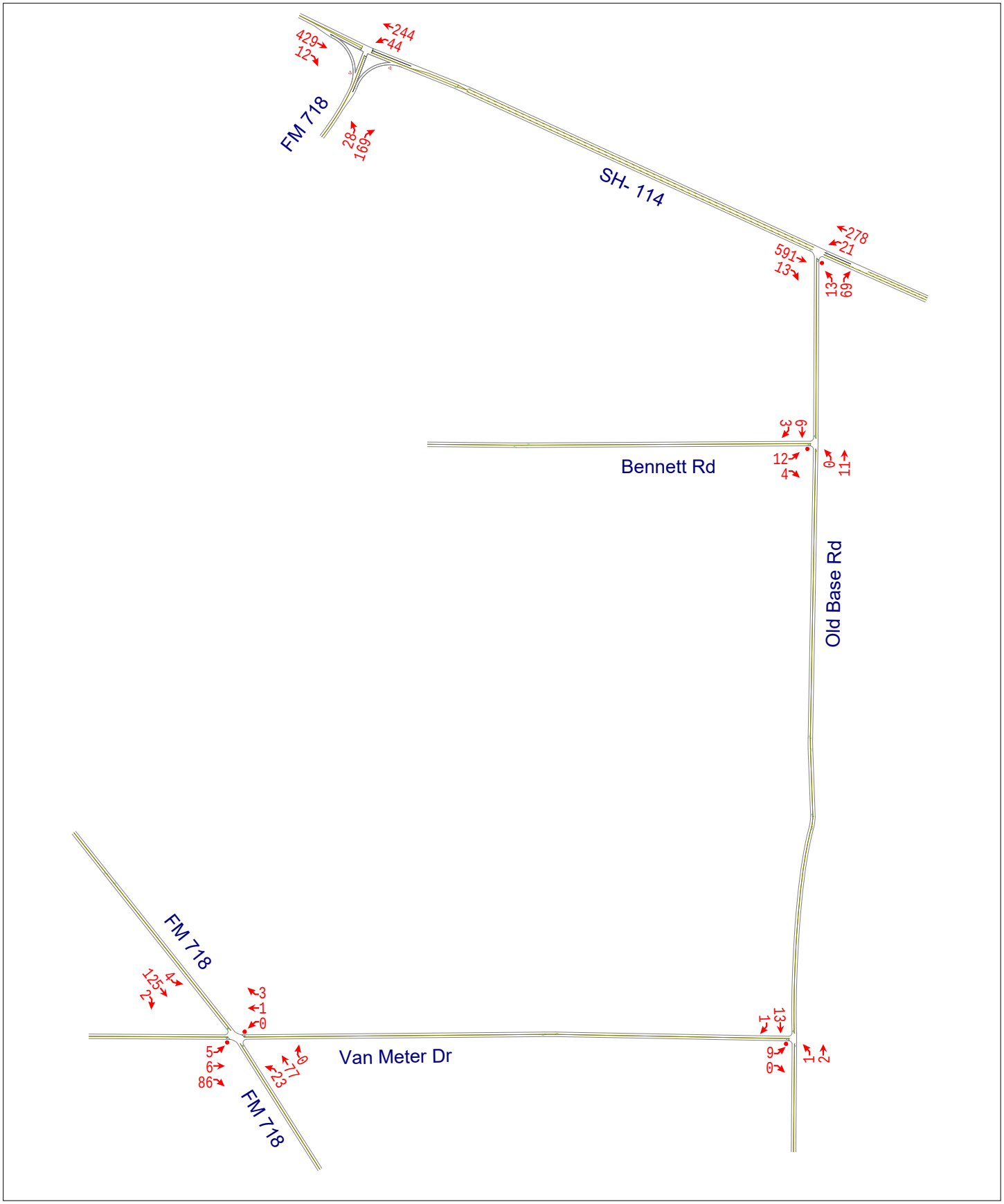
2

TIA for Lakes of Aurora Estates in Aurora, Texas.

PROJECT #15172

Exhibit 3A. Existing AM Peak Hour Traffic Volumes

North ^
Not to Scale



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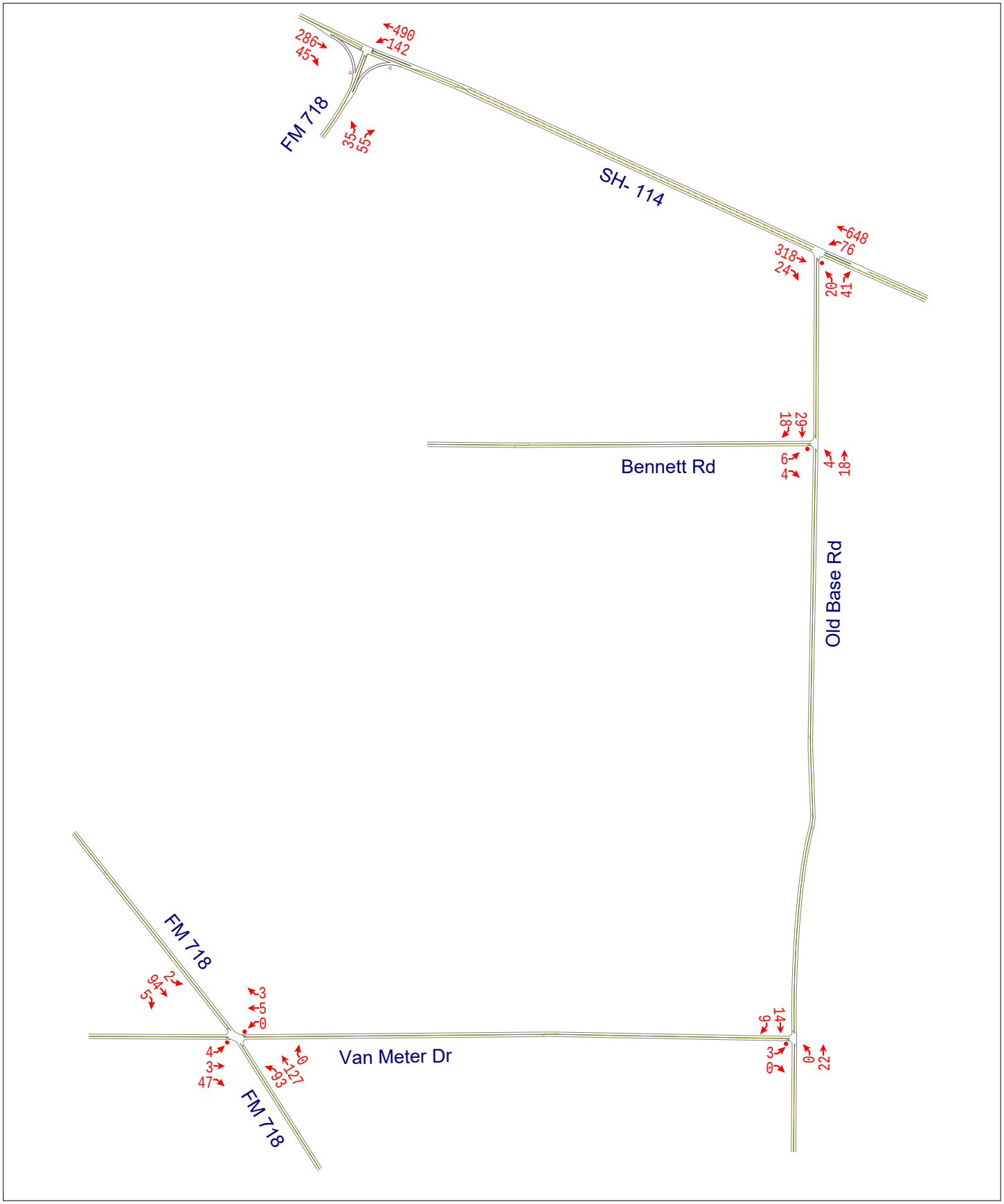
TIA for Lakes of Aurora Estates in Aurora, TX

Exhibit 3B. Existing PM Peak Hour Traffic Volumes

North ^
Not to Scale



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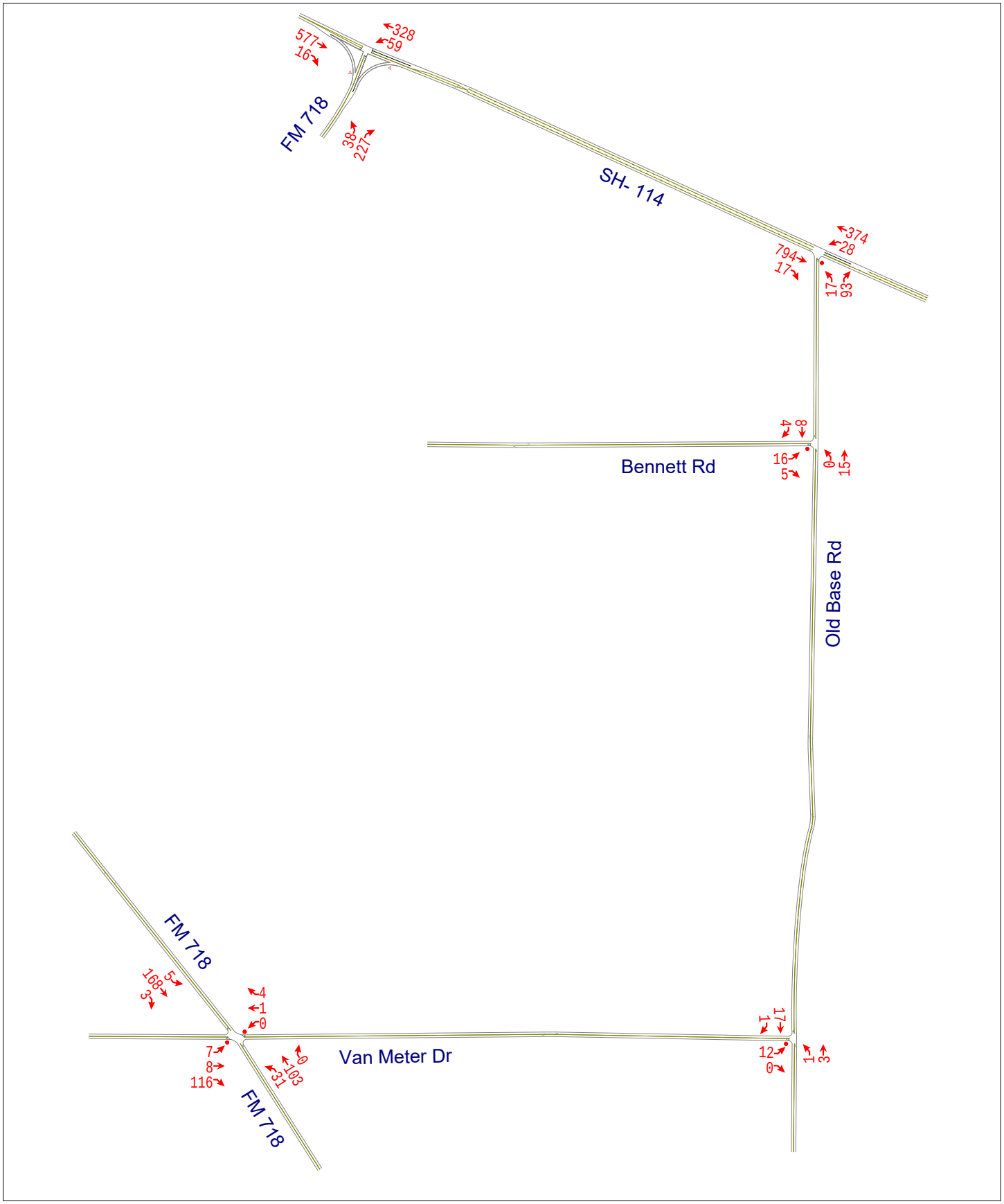
TIA for Lakes of Aurora Estates in Aurora, TX

Exhibit 4A. 2025 Background AM Peak Hour Traffic Volumes

North ^
Not to Scale



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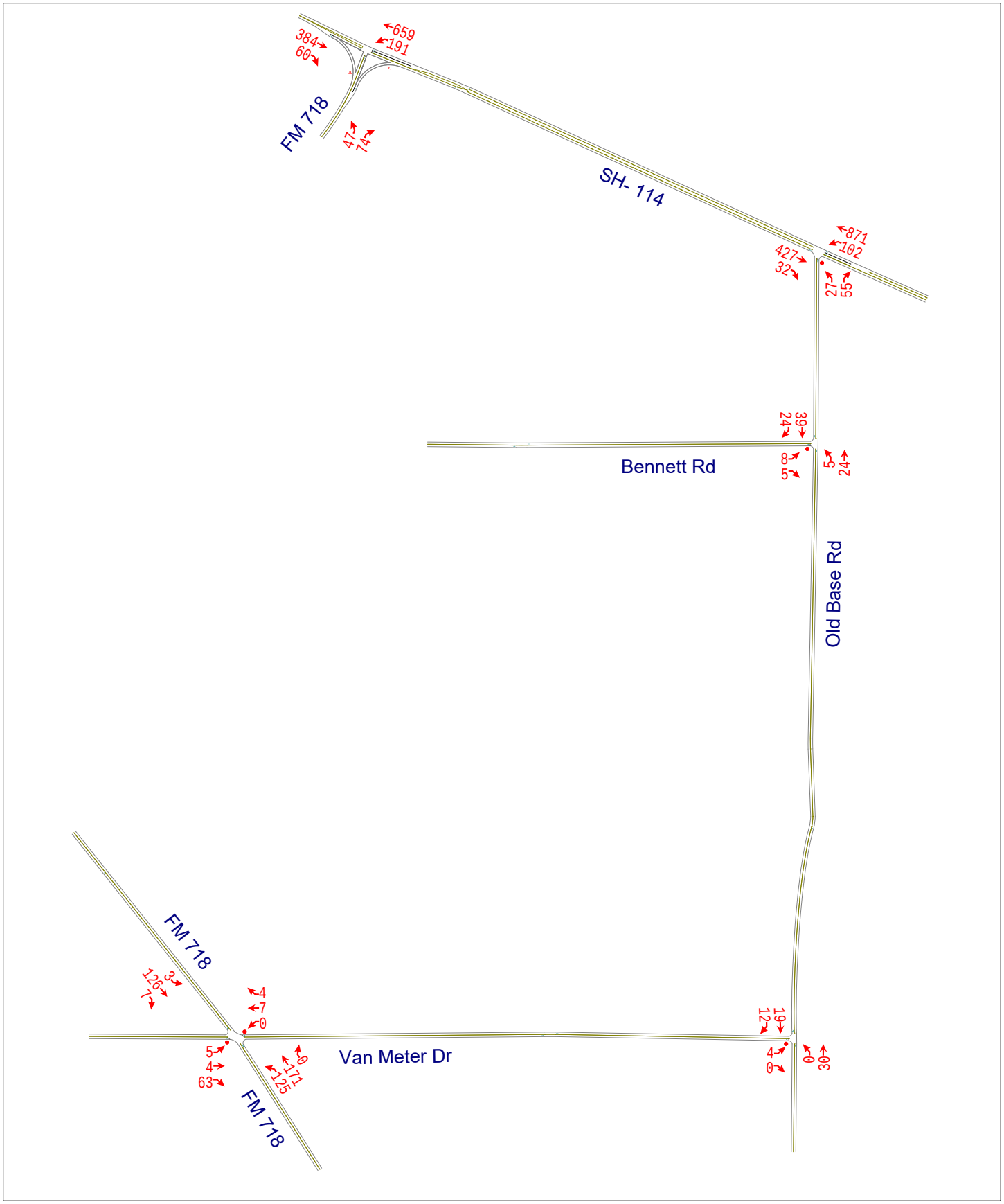
TIA for Lakes of Aurora Estates in Aurora, TX

Exhibit 4B. 2025 Background PM Peak Hour Traffic Volumes

North ^
Not to Scale

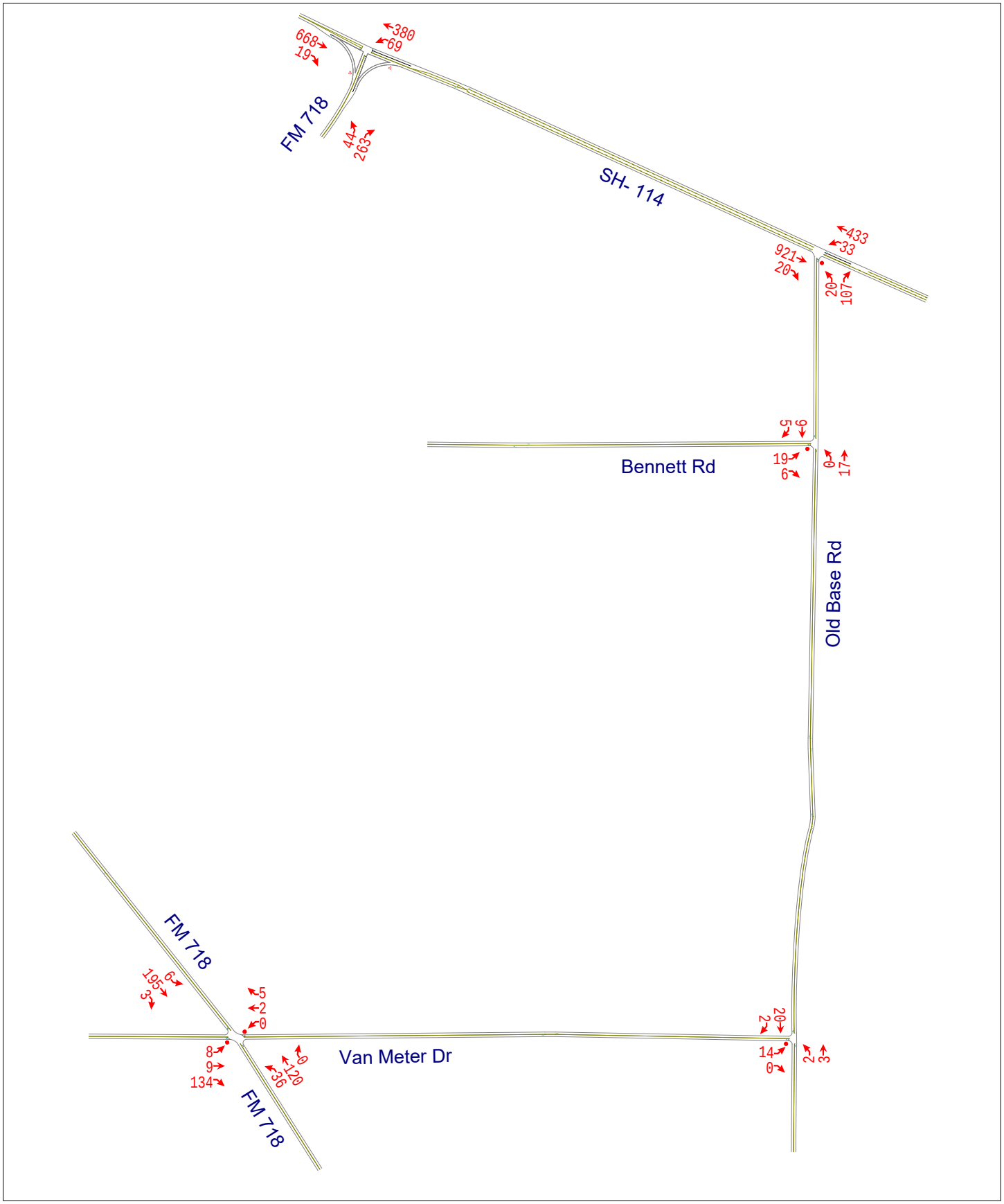


DeShazo Group

TIA for Lakes of Aurora Estates in Aurora, TX

Exhibit 5A. 2030 Background AM Peak Hour Traffic Volumes

North ^
Not to Scale

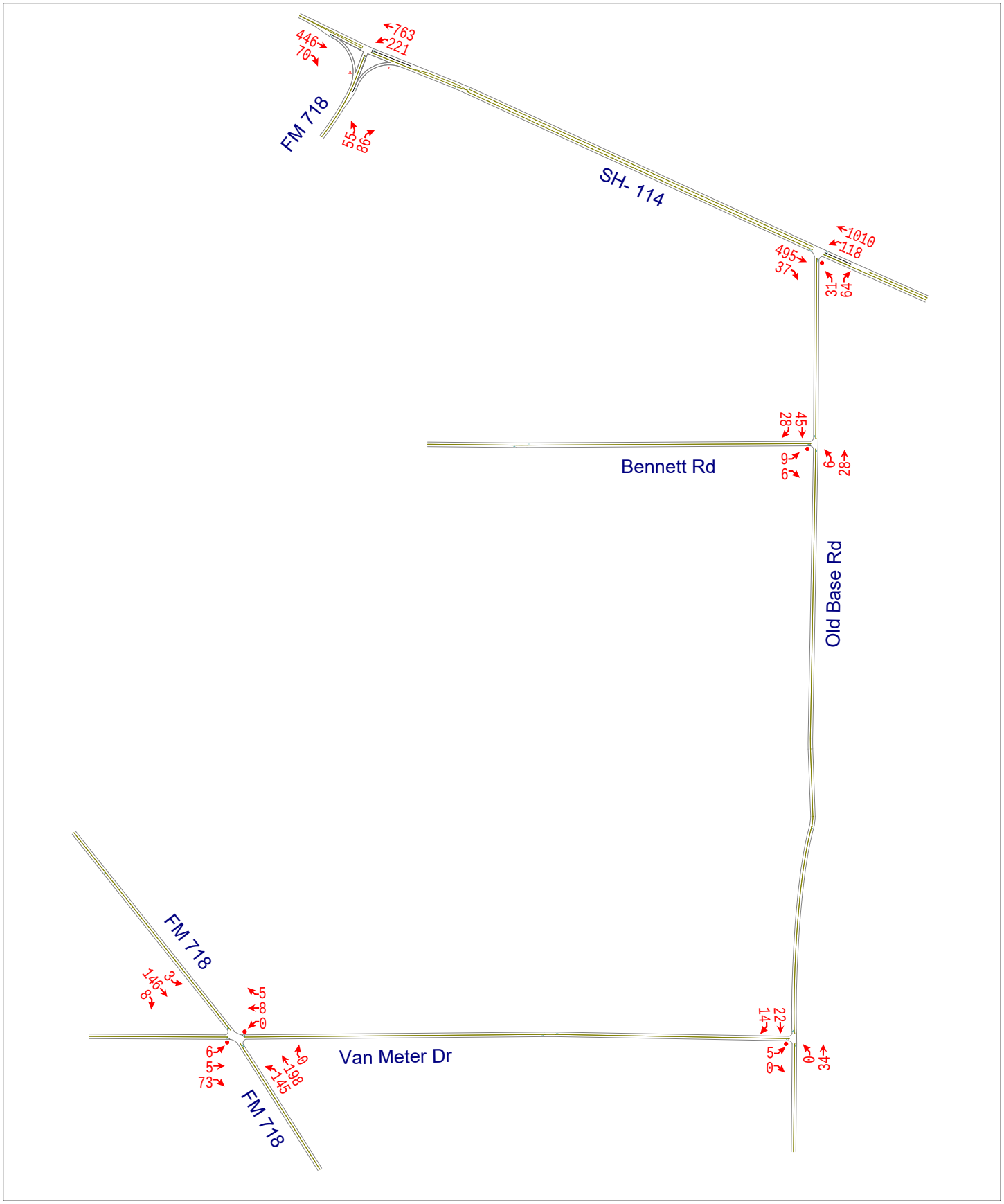


DeShazo Group

TIA for Lakes of Aurora Estates in Aurora, TX

Exhibit 5B. 2030 Background PM Peak Hour Traffic Volumes

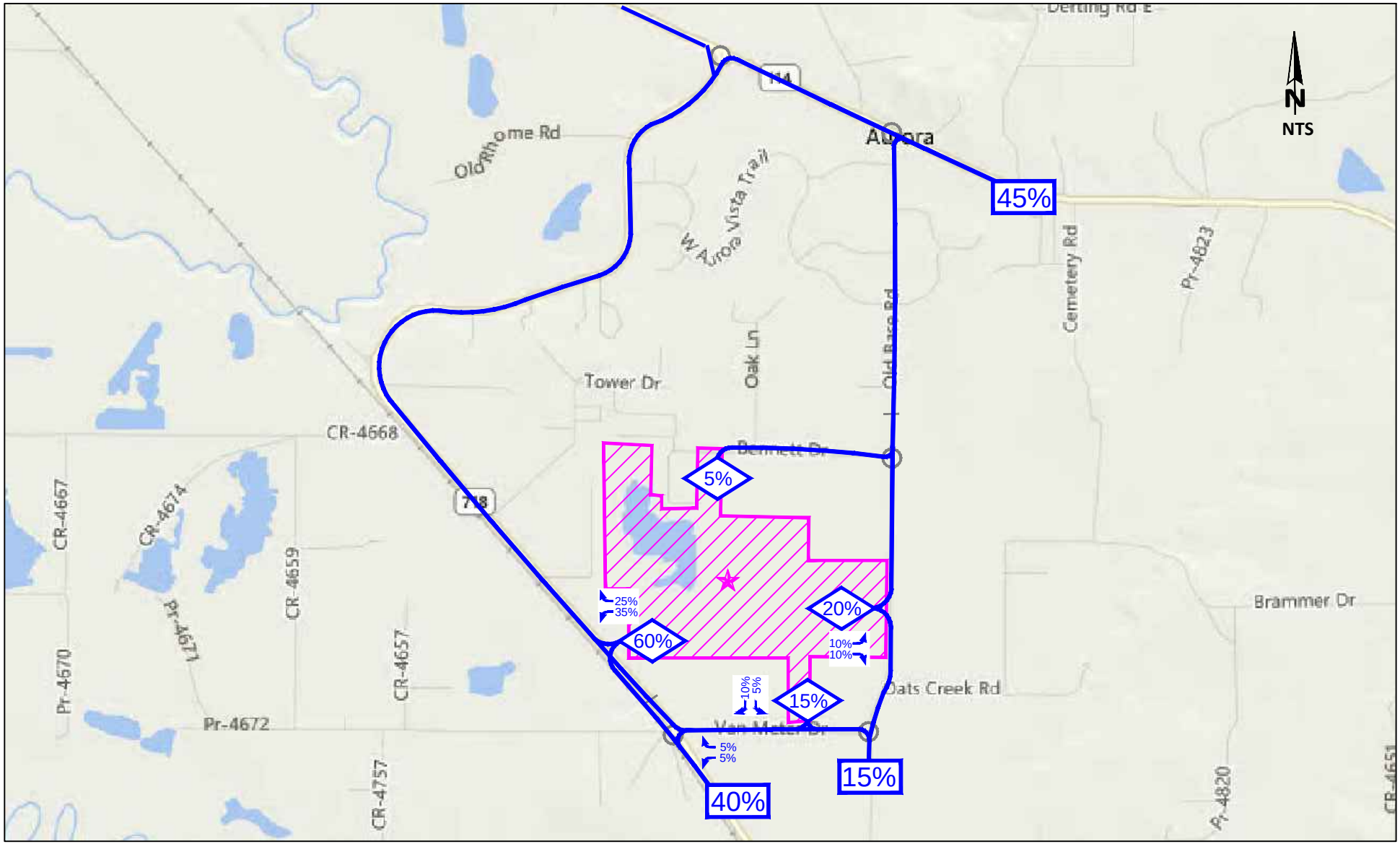
North ^
Not to Scale



DeShazo Group

TIA for Lakes of Aurora Estates in Aurora, TX

DeShazo Group



LEGEND:

- Study Site
- Existing Traffic Signal
- Study Intersections
- 24-Hour Tube Counts
- X% - Inbound/Outbound Trip Distribution
- X% - Inbound/Outbound Traffic Assignment

Site Generated Trip Distribution - Inbound

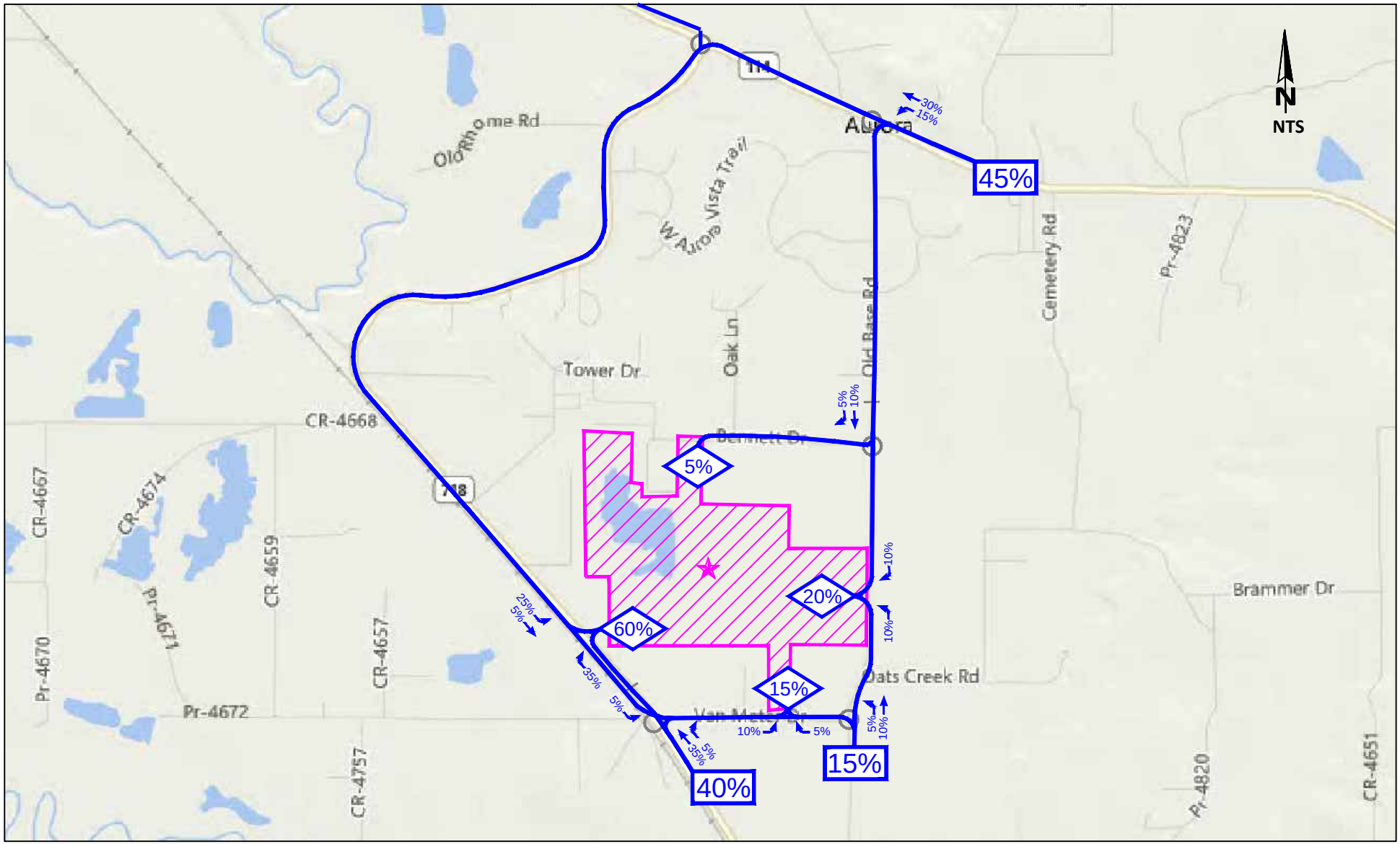
EXHIBIT **6B**

Lakes of Aurora Estates Traffic Impact Analysis in Aurora, Texas.

PROJECT #15172

DeShazo Group, Inc. Job No. 15172 Exhibit Created on 09-30-2015

DeShazo Group



LEGEND:

- Study Site
- Existing Traffic Signal
- Study Intersections
- 24-Hour Tube Counts
- X% - Inbound/Outbound Trip Distribution
- X% - Inbound/Outbound Traffic Assignment

Site Generated Trip Distribution - Inbound

TIA for Lakes of Aurora Estates in Aurora, Texas.

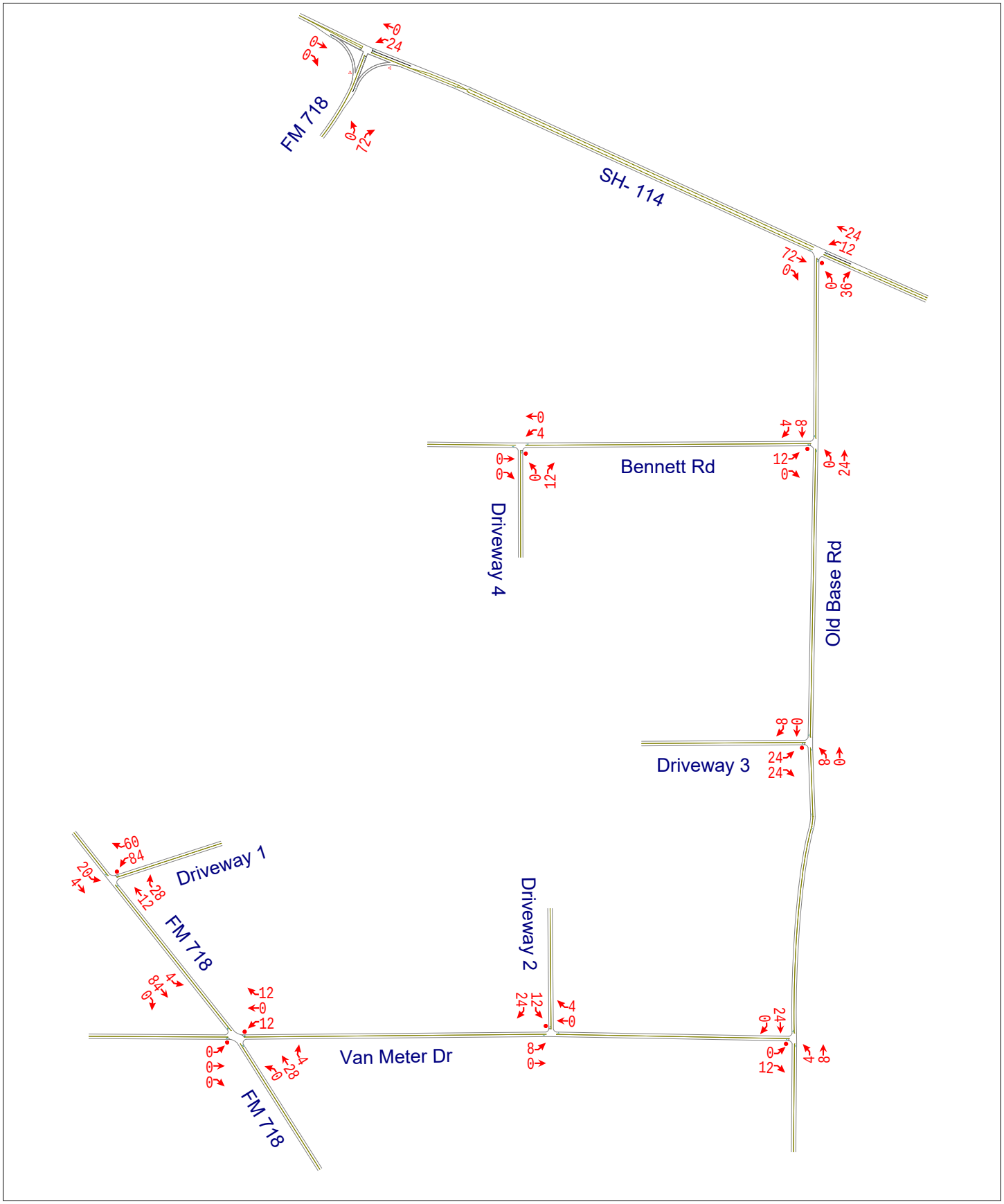
PROJECT #15172

EXHIBIT 6A

DeShazo Group, Inc. Job No. 15172 Exhibit Created on 09-30-2015

Exhibit 7A. Site Generated AM Peak Hour Traffic Volumes

North ^
Not to Scale

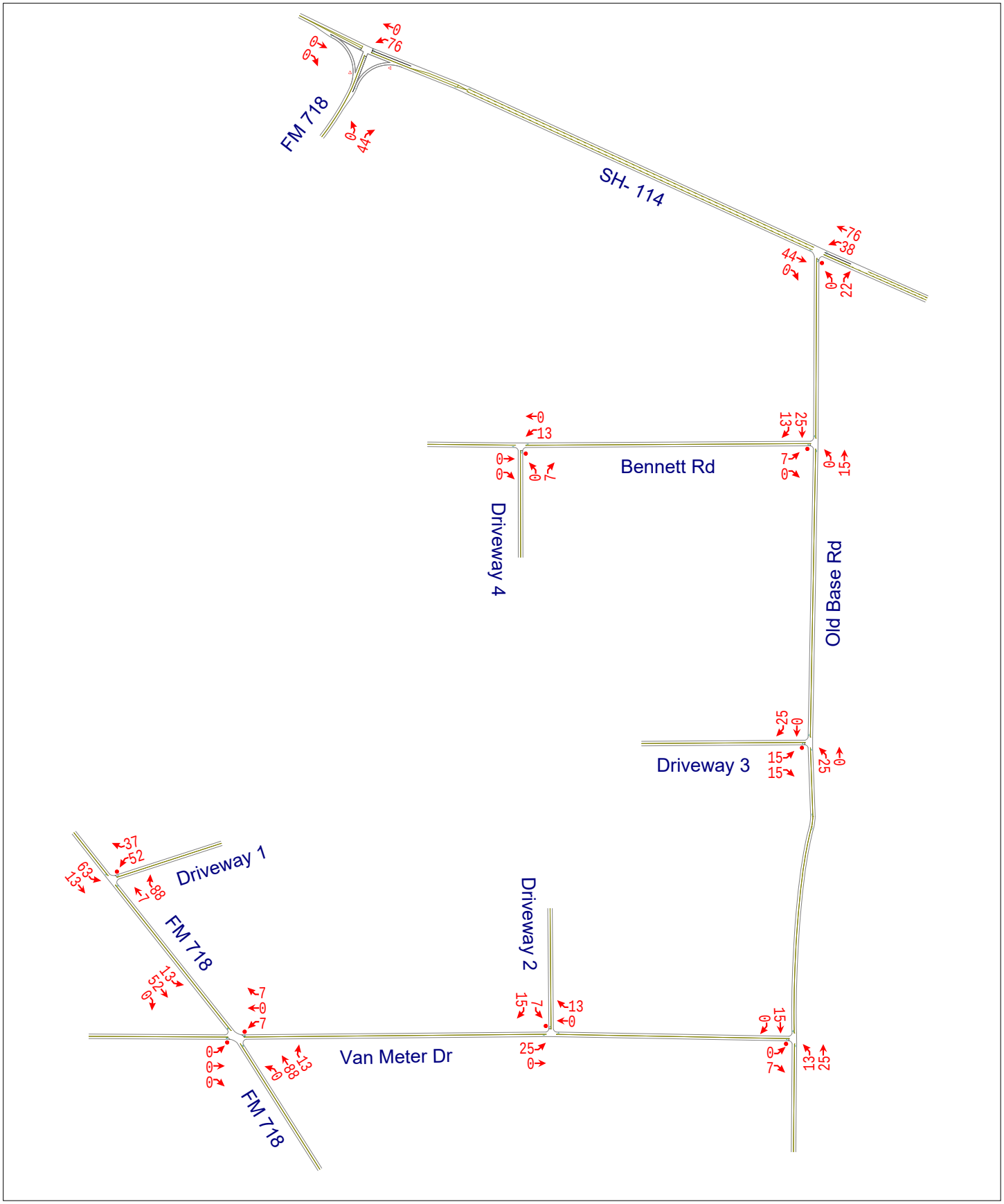


DeShazo Group

TIA for Lakes of Aurora Estates in Aurora, TX

Exhibit 7B. Site Generated PM Peak Hour Traffic Volumes

North ^
Not to Scale

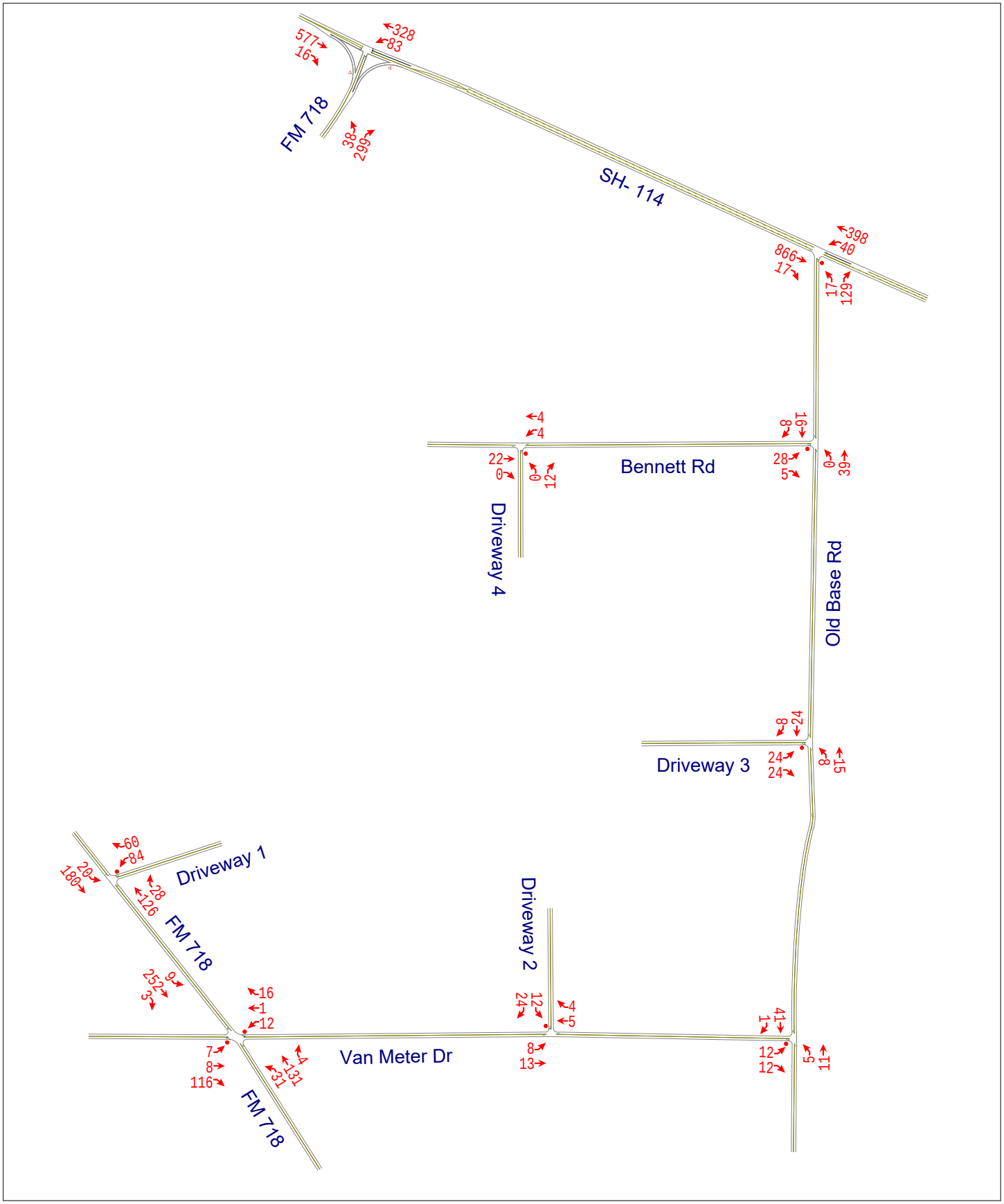


DeShazo Group

TIA for Lakes of Aurora Estates in Aurora, TX

Exhibit 8A. 2025 Background Plus Site Generated AM Peak Hour Traffic Volumes

North ^
Not to Scale

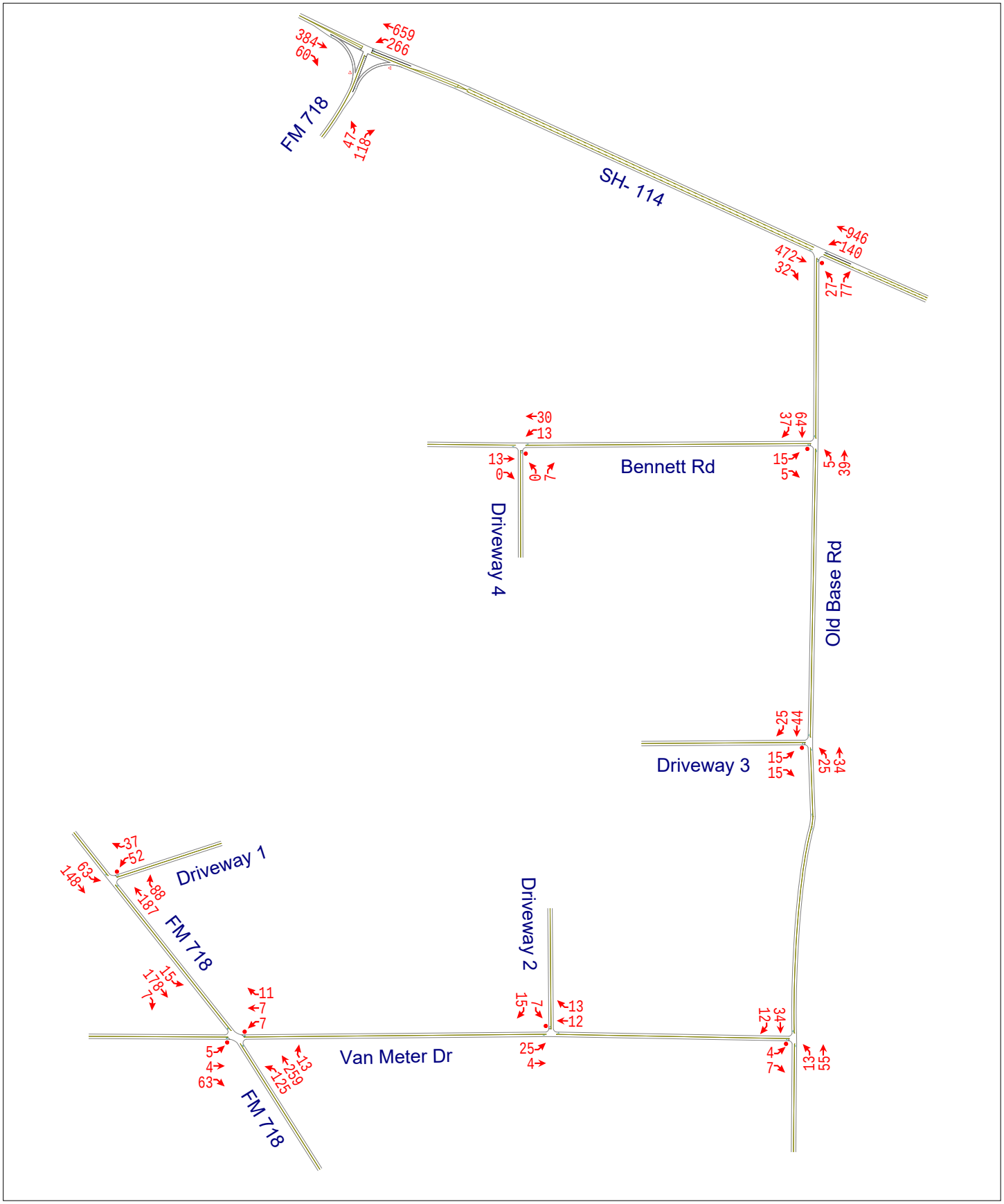


DeShazo Group

TIA for Lakes of Aurora Estates in Aurora, TX

Exhibit 8B. 2025 Background Plus Site Generated PM Peak Hour Traffic Volumes

North ^
Not to Scale

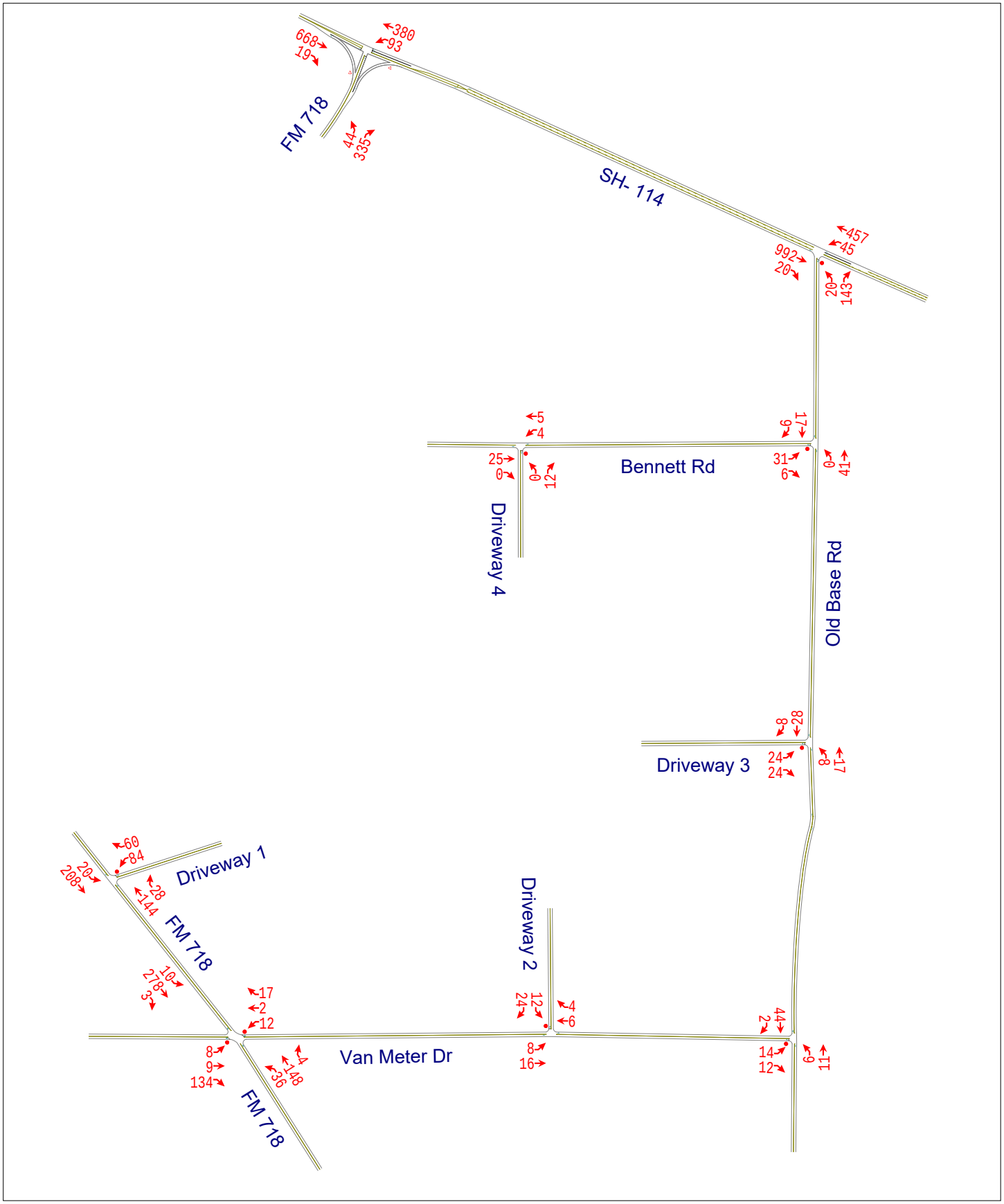


DeShazo Group

TIA for Lakes of Aurora Estates in Aurora, TX

Exhibit 9A. 2030 Background Plus Site Generated AM Peak Hour Traffic Volumes

North ^
Not to Scale

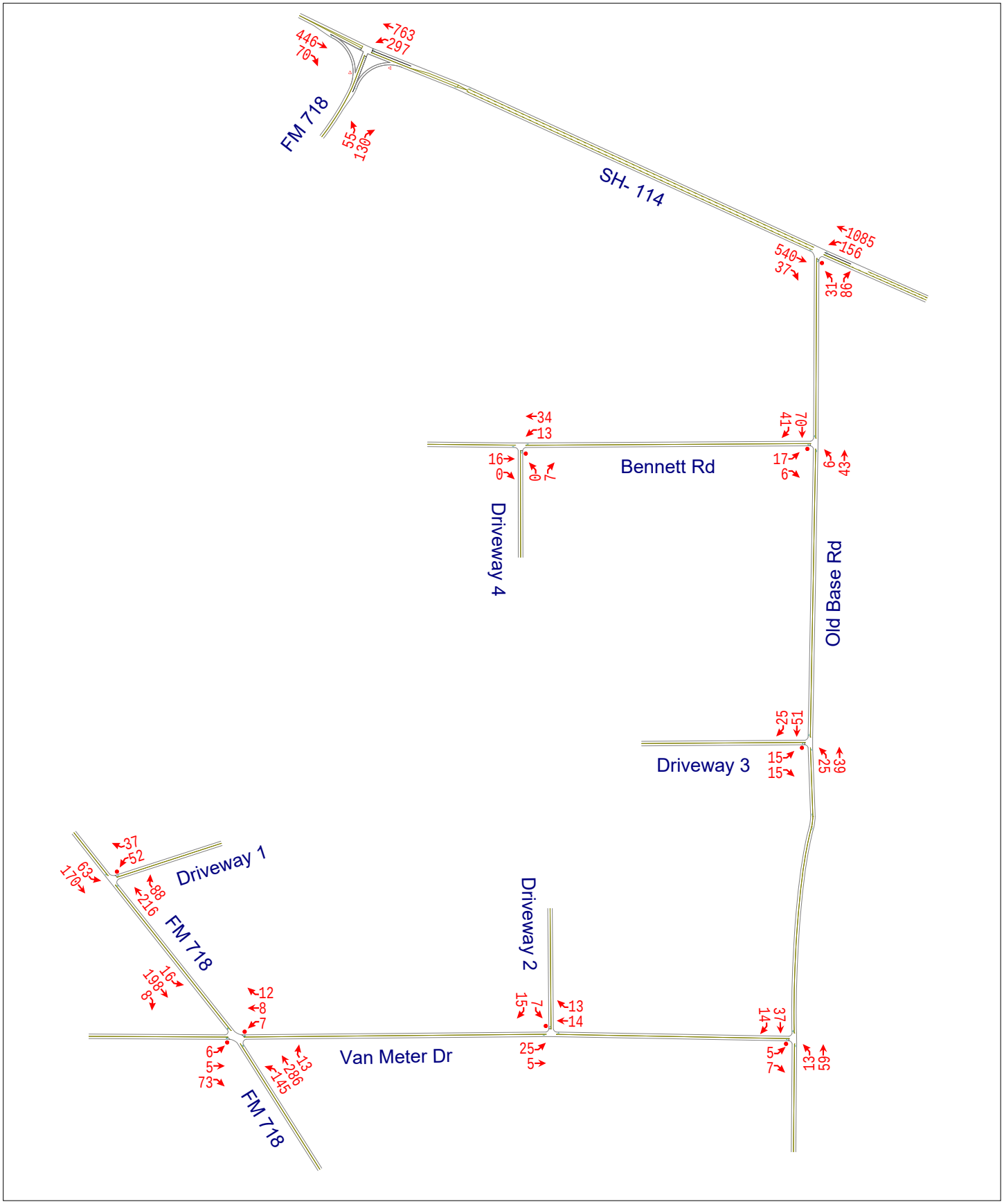


DeShazo Group

TIA for Lakes of Aurora Estates in Aurora, TX

Exhibit 9B. 2030 Background Plus Site Generated PM Peak Hour Traffic Volumes

North ^
Not to Scale

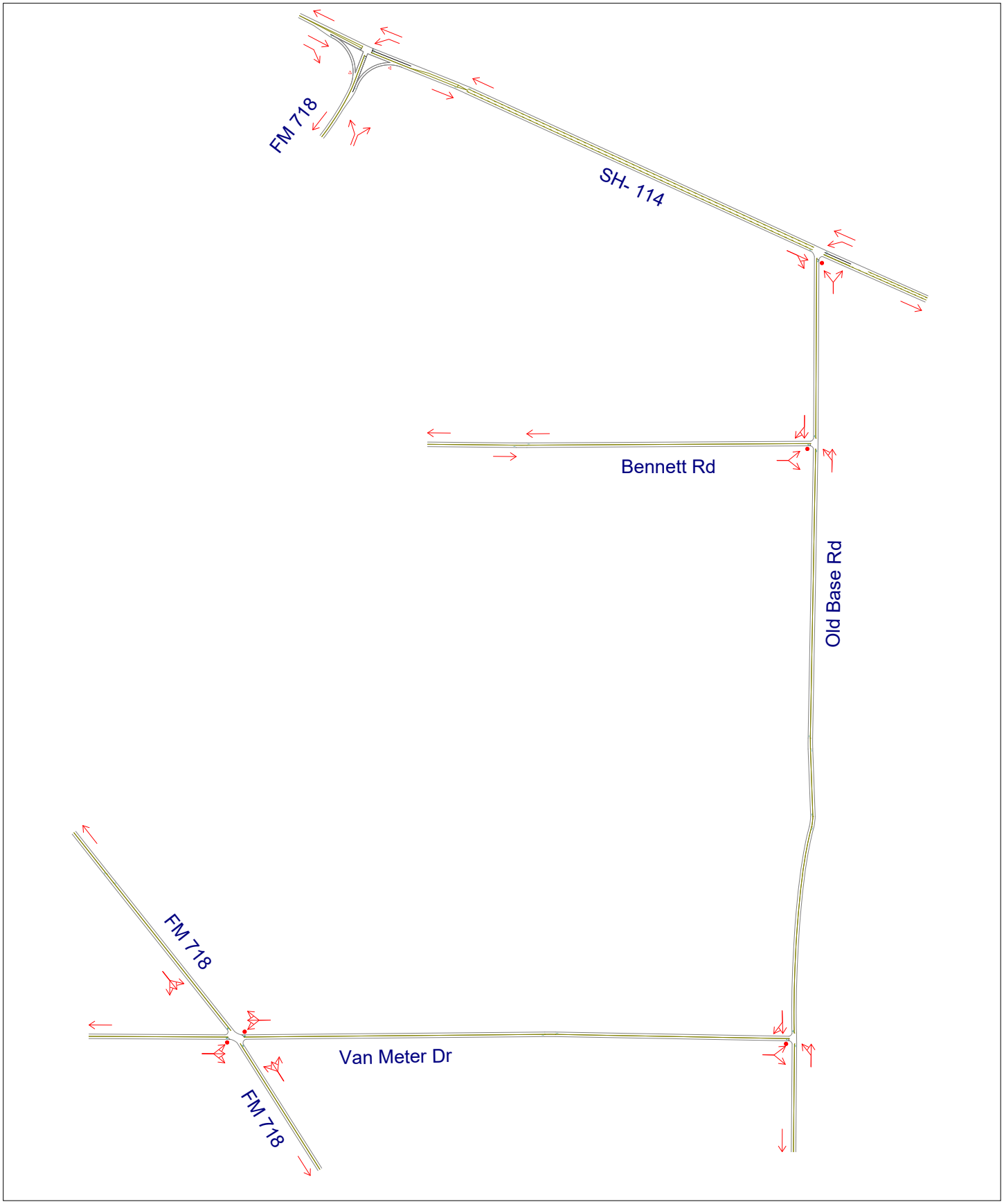


DeShazo Group

TIA for Lakes of Aurora Estates in Aurora, TX

Exhibit 10. Existing Roadway Geometry and Traffic Control

North ^
Not to Scale



DeShazo Group

TIA for Lakes of Aurora Estates in Aurora, TX

Appendix A

Intersection Traffic Movements

DeShazo Group, Inc.

Location: ***F.M. 718 at Van Meter Drive***
City/State: ***Aurora, Texas***
Day/Date: ***Wednesday, September 23, 2015***
Project-ID #: ***15172-01***
Data Source: ***CJ Hensch***

Data Collector(s): ***Camera***
Weather Conditions: ***Mild/Normal Conditions***
Traffic Control: ***Unsignalized***
Description: ***Minor-Street STOP Controlled***

Time of Count		Northbound on *F.M. 718*				Southbound on *F.M. 718*				Eastbound on *Van Meter Drive*				Westbound on *Van Meter Drive*			
Begin	**End**	**Peds**	**L**	**T**	**R**	**Peds**	**L**	**T**	**R**	**Peds**	**L**	**T**	**R**	**Peds**	**L**	**T**	**R**
6:30 AM	***6:45 AM***	***0***	***6***	***27***	***0***	***0***	***0***	***34***	***0***	***0***	***1***	***1***	***23***	***0***	***0***	***0***	***0***
6:45 AM	***7:00 AM***	***0***	***3***	***18***	***0***	***0***	***2***	***27***	***0***	***0***	***1***	***0***	***21***	***0***	***0***	***0***	***1***
7:00 AM	***7:15 AM***	***0***	***6***	***9***	***0***	***0***	***0***	***26***	***0***	***0***	***1***	***1***	***25***	***0***	***0***	***1***	***1***
7:15 AM	***7:30 AM***	***0***	***8***	***23***	***0***	***0***	***2***	***38***	***2***	***0***	***2***	***4***	***17***	***0***	***0***	***0***	***1***
7:30 AM	7:45 AM	0	4	30	0	0	0	20	1	0	0	1	21	0	0	0	1
7:45 AM	8:00 AM	0	10	14	0	0	0	24	0	0	1	1	18	0	0	0	1
8:00 AM	8:15 AM	0	5	18	1	0	0	27	0	0	1	0	17	0	0	1	1
8:15 AM	8:30 AM	0	6	15	0	0	0	23	2	0	0	2	16	0	0	1	1
Intersection PHV:			*23*	*77*	*0*		*4*	*125*	*2*		*5*	*6*	*86*		*0*	*1*	*3*
PHF:			*0.72*	*0.71*	*0.00*		*0.50*	*0.82*	*0.25*		*0.63*	*0.38*	*0.86*		*0.00*	*0.25*	*0.75*
Intersection Peak Hour: 6:30 AM - 7:30 AM															*Intersection PHF: 0.86*		
Study Area PHV:			**23**	**77**	**0**		**4**	**125**	**2**		**5**	**6**	**86**		**0**	**1**	**3**
PHF:			**0.72**	**0.71**	**0.00**		**0.50**	**0.82**	**0.25**		**0.63**	**0.38**	**0.86**		**0.00**	**0.25**	**0.75**
Study Peak Hour: 6:30 AM - 7:30 AM															**Study Area PHF: 0.86**		
4:30 PM	4:45 PM	0	16	33	0	0	0	17	3	0	2	0	7	0	1	1	0
4:45 PM	5:00 PM	0	26	25	1	0	2	12	2	0	1	1	7	0	0	3	1
5:00 PM	***5:15 PM***	***0***	***23***	***26***	***0***	***0***	***1***	***26***	***2***	***0***	***1***	***0***	***7***	***0***	***0***	***2***	***1***
5:15 PM	***5:30 PM***	***0***	***25***	***35***	***0***	***0***	***0***	***20***	***0***	***0***	***0***	***2***	***9***	***0***	***0***	***2***	***0***
5:30 PM	***5:45 PM***	***0***	***26***	***35***	***0***	***0***	***1***	***33***	***2***	***0***	***2***	***1***	***16***	***0***	***0***	***0***	***0***
5:45 PM	***6:00 PM***	***0***	***19***	***31***	***0***	***0***	***0***	***15***	***1***	***0***	***1***	***0***	***15***	***0***	***0***	***1***	***2***
6:00 PM	6:15 PM	0	22	19	0	0	0	19	2	0	0	1	13	0	0	3	2
6:15 PM	6:30 PM	0	26	23	0	0	2	25	0	0	0	3	9	0	0	1	0
Intersection PHV:			*93*	*127*	*0*		*2*	*94*	*5*		*4*	*3*	*47*		*0*	*5*	*3*
PHF:			*0.89*	*0.91*	*0.00*		*0.50*	*0.71*	*0.63*		*0.50*	*0.38*	*0.73*		*0.00*	*0.63*	*0.38*
Intersection Peak Hour: 5:00 PM - 6:00 PM															*Intersection PHF: 0.83*		
Study Area PHV:			**93**	**127**	**0**		**2**	**94**	**5**		**4**	**3**	**47**		**0**	**5**	**3**
PHF:			**0.89**	**0.91**	**0.00**		**0.50**	**0.71**	**0.63**		**0.50**	**0.38**	**0.73**		**0.00**	**0.63**	**0.38**
Study Peak Hour: 5:00 PM - 6:00 PM															**Study Area PHF: 0.83**		

Observations:

DeShazo Group

File: C2X3HRS - 4L&12Mv_Peds.XLS

Intersection Traffic Movements

DeShazo Group, Inc.

Location: ***Old Base Road at Van Meter Drive***
City/State: ***Aurora, Texas***
Day/Date: ***Wednesday, September 23, 2015***
Project-ID #: ***15172-02***
Data Source: ***CJ Hensch***

Data Collector(s): ***Camera***
Weather Conditions: ***Mild/Normal Conditions***
Traffic Control: ***Unsignalized***
Description: ***Minor-Street STOP Controlled***

Time of Count		Northbound on *Old Base Road*				Southbound on *Old Base Road*				Eastbound on *Van Meter Drive*				Westbound on *Van Meter Drive*			
Begin	End	Peds	L	T	R	Peds	L	T	R	Peds	L	T	R	Peds	L	T	R
6:30 AM	**6:45 AM**	**0**	**0**	**0**	**-**	**0**	**-**	**0**	**0**	**0**	**1**	**-**	**0**	**0**	**-**	**-**	**-**
6:45 AM	**7:00 AM**	**0**	**0**	**0**	**-**	**0**	**-**	**3**	**0**	**0**	**1**	**-**	**0**	**0**	**-**	**-**	**-**
7:00 AM	***7:15 AM***	***0***	***0***	***0***	***-***	***0***	***-***	***8***	***1***	***0***	***2***	***-***	***0***	***0***	***-***	***-***	***-***
7:15 AM	***7:30 AM***	***0***	***1***	***2***	***-***	***0***	***-***	***2***	***0***	***0***	***5***	***-***	***0***	***0***	***-***	***-***	***-***
7:30 AM	*7:45 AM*	*0*	*0*	*2*	*-*	*0*	*-*	*5*	*2*	*0*	*2*	*-*	*0*	*0*	*-*	*-*	*-*
7:45 AM	*8:00 AM*	*0*	*0*	*2*	*-*	*0*	*-*	*3*	*0*	*0*	*2*	*-*	*0*	*0*	*-*	*-*	*-*
8:00 AM	8:15 AM	0	1	2	-	0	-	3	2	0	0	-	0	0	-	-	-
8:15 AM	8:30 AM	0	1	3	-	0	-	3	1	0	3	-	0	0	-	-	-
Intersection PHV:			*1*	*6*	*0*		*0*	*18*	*3*		*11*	*0*	*0*		*0*	*0*	*0*
PHF:			*0.25*	*0.75*	*0.00*		*0.00*	*0.56*	*0.38*		*0.55*	*0.00*	*0.00*		*0.00*	*0.00*	*0.00*
Intersection Peak Hour: 7:00 AM - 8:00 AM															*Intersection PHF: 0.89*		
Study Area PHV:			**1**	**2**	**0**		**0**	**13**	**1**		**9**	**0**	**0**		**0**	**0**	**0**
PHF:			**0.25**	**0.25**	**0.00**		**0.00**	**0.41**	**0.25**		**0.45**	**0.00**	**0.00**		**0.00**	**0.00**	**0.00**
Study Peak Hour: 6:30 AM - 7:30 AM															**Study Area PHF: 0.59**		
4:30 PM	*4:45 PM*	*0*	*0*	*4*	*-*	*0*	*-*	*4*	*3*	*0*	*0*	*-*	*0*	*0*	*-*	*-*	*-*
4:45 PM	*5:00 PM*	*0*	*0*	*7*	*-*	*0*	*-*	*4*	*2*	*0*	*3*	*-*	*0*	*0*	*-*	*-*	*-*
5:00 PM	***5:15 PM***	***0***	***0***	***8***	***-***	***0***	***-***	***2***	***4***	***0***	***0***	***-***	***0***	***0***	***-***	***-***	***-***
5:15 PM	***5:30 PM***	***0***	***0***	***8***	***-***	***0***	***-***	***3***	***2***	***0***	***2***	***-***	***0***	***0***	***-***	***-***	***-***
5:30 PM	**5:45 PM**	**0**	**0**	**3**	**-**	**0**	**-**	**5**	**0**	**0**	**0**	**-**	**0**	**0**	**-**	**-**	**-**
5:45 PM	**6:00 PM**	**0**	**0**	**3**	**-**	**0**	**-**	**4**	**3**	**0**	**1**	**-**	**0**	**0**	**-**	**-**	**-**
6:00 PM	6:15 PM	0	0	7	-	0	-	5	4	0	0	-	0	0	-	-	-
6:15 PM	6:30 PM	0	0	4	-	0	-	1	1	0	4	-	1	0	-	-	-
Intersection PHV:			*0*	*27*	*0*		*0*	*13*	*11*		*5*	*0*	*0*		*0*	*0*	*0*
PHF:			*0.00*	*0.84*	*0.00*		*0.00*	*0.81*	*0.69*		*0.42*	*0.00*	*0.00*		*0.00*	*0.00*	*0.00*
Intersection Peak Hour: 4:30 PM - 5:30 PM															*Intersection PHF: 0.88*		
Study Area PHV:			**0**	**22**	**0**		**0**	**14**	**9**		**3**	**0**	**0**		**0**	**0**	**0**
PHF:			**0.00**	**0.69**	**0.00**		**0.00**	**0.70**	**0.56**		**0.38**	**0.00**	**0.00**		**0.00**	**0.00**	**0.00**
Study Peak Hour: 5:00 PM - 6:00 PM															**Study Area PHF: 0.80**		

Observations:

DeShazo Group

File: C2X3HRS - 4L&12Mv_Peds.XLS

Intersection Traffic Movements

DeShazo Group, Inc.

Location: ***Old Base Road at Bennett Road***
City/State: ***Aurora, Texas***
Day/Date: ***Wednesday, September 23, 2015***
Project-ID #: ***15172-03***
Data Source: ***CJ Hensch***

Data Collector(s): ***Camera***
Weather Conditions: ***Mild/Normal Conditions***
Traffic Control: ***Unsignalized***
Description: ***Minor-Street STOP Controlled***

Time of Count		Northbound on *Old Base Road*				Southbound on *Old Base Road*				Eastbound on *Bennett Road*				Westbound on *Bennett Road*			
Begin	End	Peds	L	T	R	Peds	L	T	R	Peds	L	T	R	Peds	L	T	R
6:30 AM	**6:45 AM**	**0**	**0**	**0**	**-**	**0**	**-**	**0**	**1**	**0**	**2**	**-**	**0**	**0**	**-**	**-**	**-**
6:45 AM	**7:00 AM**	**0**	**0**	**2**	**-**	**0**	**-**	**1**	**2**	**0**	**4**	**-**	**0**	**0**	**-**	**-**	**-**
7:00 AM	***7:15 AM***	***0***	***0***	***1***	***-***	***0***	***-***	***3***	***0***	***0***	***4***	***-***	***1***	***0***	***-***	***-***	***-***
7:15 AM	***7:30 AM***	***0***	***0***	***8***	***-***	***0***	***-***	***2***	***0***	***0***	***2***	***-***	***3***	***0***	***-***	***-***	***-***
7:30 AM	*7:45 AM*	*0*	*3*	*5*	*-*	*0*	*-*	*2*	*1*	*0*	*6*	*-*	*2*	*0*	*-*	*-*	*-*
7:45 AM	*8:00 AM*	*0*	*0*	*4*	*-*	*0*	*-*	*2*	*1*	*0*	*2*	*-*	*2*	*0*	*-*	*-*	*-*
8:00 AM	8:15 AM	0	1	0	-	0	-	4	2	0	1	-	0	0	-	-	-
8:15 AM	8:30 AM	0	1	5	-	0	-	4	1	0	2	-	0	0	-	-	-
Intersection PHV:			*3*	*18*	*0*		*0*	*9*	*2*		*14*	*0*	*8*		*0*	*0*	*0*
PHF:			*0.25*	*0.56*	*0.00*		*0.00*	*0.75*	*0.50*		*0.58*	*0.00*	*0.67*		*0.00*	*0.00*	*0.00*
Intersection Peak Hour: 7:00 AM - 8:00 AM															*Intersection PHF: 0.71*		
Study Area PHV:			**0**	**11**	**0**		**0**	**6**	**3**		**12**	**0**	**4**		**0**	**0**	**0**
PHF:			**0.00**	**0.34**	**0.00**		**0.00**	**0.50**	**0.38**		**0.75**	**0.00**	**0.33**		**0.00**	**0.00**	**0.00**
Study Peak Hour: 6:30 AM - 7:30 AM															**Study Area PHF: 0.60**		
4:30 PM	4:45 PM	0	2	3	-	0	-	5	7	0	1	-	0	0	-	-	-
4:45 PM	*5:00 PM*	*0*	*1*	*6*	*-*	*0*	*-*	*5*	*3*	*0*	*4*	*-*	*0*	*0*	*-*	*-*	*-*
5:00 PM	***5:15 PM***	***0***	***2***	***3***	***-***	***0***	***-***	***5***	***1***	***0***	***1***	***-***	***1***	***0***	***-***	***-***	***-***
5:15 PM	***5:30 PM***	***0***	***1***	***9***	***-***	***0***	***-***	***6***	***8***	***0***	***1***	***-***	***1***	***0***	***-***	***-***	***-***
5:30 PM	***5:45 PM***	***0***	***1***	***3***	***-***	***0***	***-***	***9***	***5***	***0***	***2***	***-***	***1***	***0***	***-***	***-***	***-***
5:45 PM	**6:00 PM**	**0**	**0**	**3**	**-**	**0**	**-**	**9**	**4**	**0**	**2**	**-**	**1**	**0**	**-**	**-**	**-**
6:00 PM	6:15 PM	0	1	3	-	0	-	5	2	0	0	-	1	0	-	-	-
6:15 PM	6:30 PM	0	0	7	-	0	-	3	4	0	0	-	0	0	-	-	-
Intersection PHV:			*5*	*21*	*0*		*0*	*25*	*17*		*8*	*0*	*3*		*0*	*0*	*0*
PHF:			*0.63*	*0.58*	*0.00*		*0.00*	*0.69*	*0.53*		*0.50*	*0.00*	*0.75*		*0.00*	*0.00*	*0.00*
Intersection Peak Hour: 4:45 PM - 5:45 PM															*Intersection PHF: 0.76*		
Study Area PHV:			**4**	**18**	**0**		**0**	**29**	**18**		**6**	**0**	**4**		**0**	**0**	**0**
PHF:			**0.50**	**0.50**	**0.00**		**0.00**	**0.81**	**0.56**		**0.75**	**0.00**	**1.00**		**0.00**	**0.00**	**0.00**
Study Peak Hour: 5:00 PM - 6:00 PM															**Study Area PHF: 0.76**		

Observations:

DeShazo Group

File: C2X3HRS - 4L&12Mv_Peds.XLS

Intersection Traffic Movements

DeShazo Group, Inc.

Location: ***Old Base Road at S.H. 114***
City/State: ***Aurora, Texas***
Day/Date: ***Wednesday, September 23, 2015***
Project-ID #: ***15172-04***
Data Source: ***CJ Hensch***

Data Collector(s): ***Camera***
Weather Conditions: ***Mild/Normal Conditions***
Traffic Control: ***Unsignalized***
Description: ***Minor-Street STOP Controlled***

Time of Count		Northbound on *Old Base Road*				Southbound on *Old Base Road*				Eastbound on *S.H. 114*				Westbound on *S.H. 114*			
Begin	**End**	**Peds**	**L**	**T**	**R**	**Peds**	**L**	**T**	**R**	**Peds**	**L**	**T**	**R**	**Peds**	**L**	**T**	**R**
6:30 AM	***6:45 AM***	***0***	***2***	***-***	***9***	***0***	***-***	***-***	***-***	***0***	***-***	***174***	***4***	***0***	***2***	***70***	***-***
6:45 AM	***7:00 AM***	***0***	***4***	***-***	***15***	***0***	***-***	***-***	***-***	***0***	***-***	***148***	***4***	***0***	***8***	***67***	***-***
7:00 AM	***7:15 AM***	***0***	***3***	***-***	***25***	***0***	***-***	***-***	***-***	***0***	***-***	***151***	***1***	***0***	***3***	***71***	***-***
7:15 AM	***7:30 AM***	***0***	***4***	***-***	***20***	***0***	***-***	***-***	***-***	***0***	***-***	***118***	***4***	***0***	***8***	***70***	***-***
7:30 AM	7:45 AM	0	4	-	23	0	-	-	-	0	-	145	4	0	6	74	-
7:45 AM	8:00 AM	0	4	-	17	0	-	-	-	0	-	127	7	0	8	77	-
8:00 AM	8:15 AM	0	1	-	18	0	-	-	-	0	-	126	3	0	8	64	-
8:15 AM	8:30 AM	0	5	-	11	0	-	-	-	0	-	101	3	0	5	66	-
Intersection PHV:			*13*	*0*	*69*		*0*	*0*	*0*		*0*	*591*	*13*		*21*	*278*	*0*
PHF:			*0.81*	*0.00*	*0.69*		*0.00*	*0.00*	*0.00*		*0.00*	*0.85*	*0.81*		*0.66*	*0.98*	*0.00*
Intersection Peak Hour: 6:30 AM - 7:30 AM																	*Intersection PHF: 0.94*
Study Area PHV:			**13**	**0**	**69**		**0**	**0**	**0**		**0**	**591**	**13**		**21**	**278**	**0**
PHF:			**0.81**	**0.00**	**0.69**		**0.00**	**0.00**	**0.00**		**0.00**	**0.85**	**0.81**		**0.66**	**0.98**	**0.00**
Study Peak Hour: 6:30 AM - 7:30 AM																	**Study Area PHF: 0.94**
4:30 PM	4:45 PM	0	5	-	5	0	-	-	-	0	-	79	6	0	22	136	-
4:45 PM	5:00 PM	0	1	-	13	0	-	-	-	0	-	81	4	0	13	141	-
5:00 PM	***5:15 PM***	***0***	***3***	***-***	***10***	***0***	***-***	***-***	***-***	***0***	***-***	***102***	***5***	***0***	***16***	***138***	***-***
5:15 PM	***5:30 PM***	***0***	***6***	***-***	***10***	***0***	***-***	***-***	***-***	***0***	***-***	***69***	***7***	***0***	***19***	***168***	***-***
5:30 PM	***5:45 PM***	***0***	***9***	***-***	***10***	***0***	***-***	***-***	***-***	***0***	***-***	***80***	***7***	***0***	***23***	***177***	***-***
5:45 PM	***6:00 PM***	***0***	***2***	***-***	***11***	***0***	***-***	***-***	***-***	***0***	***-***	***67***	***5***	***0***	***18***	***165***	***-***
6:00 PM	6:15 PM	0	1	-	7	0	-	-	-	0	-	79	1	0	12	105	-
6:15 PM	6:30 PM	0	0	-	12	0	-	-	-	0	-	62	4	0	15	128	-
Intersection PHV:			*20*	*0*	*41*		*0*	*0*	*0*		*0*	*318*	*24*		*76*	*648*	*0*
PHF:			*0.56*	*0.00*	*0.93*		*0.00*	*0.00*	*0.00*		*0.00*	*0.78*	*0.86*		*0.83*	*0.92*	*0.00*
Intersection Peak Hour: 5:00 PM - 6:00 PM																	*Intersection PHF: 0.92*
Study Area PHV:			**20**	**0**	**41**		**0**	**0**	**0**		**0**	**318**	**24**		**76**	**648**	**0**
PHF:			**0.56**	**0.00**	**0.93**		**0.00**	**0.00**	**0.00**		**0.00**	**0.78**	**0.86**		**0.83**	**0.92**	**0.00**
Study Peak Hour: 5:00 PM - 6:00 PM																	**Study Area PHF: 0.92**

Observations:

DeShazo Group

File: C2X3HRS - 4L&12Mv_Peds.XLS

Intersection Traffic Movements

DeShazo Group, Inc.

Location: ***F.M. 718 at S.H. 114***
City/State: ***Aurora, Texas***
Day/Date: ***Wednesday, September 23, 2015***
Project-ID #: ***15172-05***
Data Source: ***CJ Hensch***

Data Collector(s): ***Camera***
Weather Conditions: ***Mild/Normal Conditions***
Traffic Control: ***Unsignalized***
Description: ***Minor-Street STOP Controlled***

Time of Count		Northbound on F.M. 718				Southbound on F.M. 718				Eastbound on S.H. 114				Westbound on S.H. 114			
Begin	End	Peds	L	T	R	Peds	L	T	R	Peds	L	T	R	Peds	L	T	R
6:30 AM	6:45 AM	0	5	-	58	0	-	-	-	0	-	119	2	0	5	67	-
6:45 AM	7:00 AM	0	8	-	38	0	-	-	-	0	-	109	4	0	16	55	-
7:00 AM	7:15 AM	0	6	-	41	0	-	-	-	0	-	110	3	0	14	63	-
7:15 AM	7:30 AM	0	9	-	32	0	-	-	-	0	-	91	3	0	9	59	-
7:30 AM	7:45 AM	0	16	-	55	0	-	-	-	0	-	89	7	0	10	65	-
7:45 AM	8:00 AM	0	9	-	44	0	-	-	-	0	-	92	3	0	11	66	-
8:00 AM	8:15 AM	0	3	-	28	0	-	-	-	0	-	101	3	0	13	53	-
8:15 AM	8:30 AM	0	8	-	26	0	-	-	-	0	-	76	4	0	12	58	-
Intersection PHV:			*28*	*0*	*169*		*0*	*0*	*0*		*0*	*429*	*12*		*44*	*244*	*0*
PHF:			*0.78*	*0.00*	*0.73*		*0.00*	*0.00*	*0.00*		*0.00*	*0.90*	*0.75*		*0.69*	*0.91*	*0.00*
Intersection Peak Hour: 6:30 AM - 7:30 AM																	*Intersection PHF: 0.90*
Study Area PHV:			**28**	**0**	**169**		**0**	**0**	**0**		**0**	**429**	**12**		**44**	**244**	**0**
PHF:			**0.78**	**0.00**	**0.73**		**0.00**	**0.00**	**0.00**		**0.00**	**0.90**	**0.75**		**0.69**	**0.91**	**0.00**
Study Peak Hour: 6:30 AM - 7:30 AM																	**Study Area PHF: 0.90**
4:30 PM	4:45 PM	0	14	-	19	0	-	-	-	0	-	64	4	0	25	108	-
4:45 PM	*5:00 PM*	*0*	*10*	*-*	*17*	*0*	*-*	*-*	*-*	*0*	*-*	*66*	*8*	*0*	*39*	*112*	*-*
5:00 PM	**5:15 PM**	**0**	**4**	**-**	**16**	**0**	**-**	**-**	**-**	**0**	**-**	**94**	**17**	**0**	**21**	**103**	**-**
5:15 PM	**5:30 PM**	**0**	**10**	**-**	**11**	**0**	**-**	**-**	**-**	**0**	**-**	**61**	**10**	**0**	**42**	**135**	**-**
5:30 PM	**5:45 PM**	**0**	**11**	**-**	**19**	**0**	**-**	**-**	**-**	**0**	**-**	**71**	**11**	**0**	**44**	**130**	**-**
5:45 PM	**6:00 PM**	**0**	**10**	**-**	**9**	**0**	**-**	**-**	**-**	**0**	**-**	**60**	**7**	**0**	**35**	**122**	**-**
6:00 PM	6:15 PM	0	7	-	12	0	-	-	-	0	-	65	11	0	17	87	-
6:15 PM	6:30 PM	0	8	-	8	0	-	-	-	0	-	56	12	0	25	94	-
Intersection PHV:			*35*	*0*	*63*		*0*	*0*	*0*		*0*	*292*	*46*		*146*	*480*	*0*
PHF:			*0.80*	*0.00*	*0.83*		*0.00*	*0.00*	*0.00*		*0.00*	*0.78*	*0.68*		*0.83*	*0.89*	*0.00*
Intersection Peak Hour: 4:45 PM - 5:45 PM																	*Intersection PHF: 0.93*
Study Area PHV:			**35**	**0**	**55**		**0**	**0**	**0**		**0**	**286**	**45**		**142**	**490**	**0**
PHF:			**0.80**	**0.00**	**0.72**		**0.00**	**0.00**	**0.00**		**0.00**	**0.76**	**0.66**		**0.81**	**0.91**	**0.00**
Study Peak Hour: 5:00 PM - 6:00 PM																	**Study Area PHF: 0.92**

Observations:

DeShazo Group

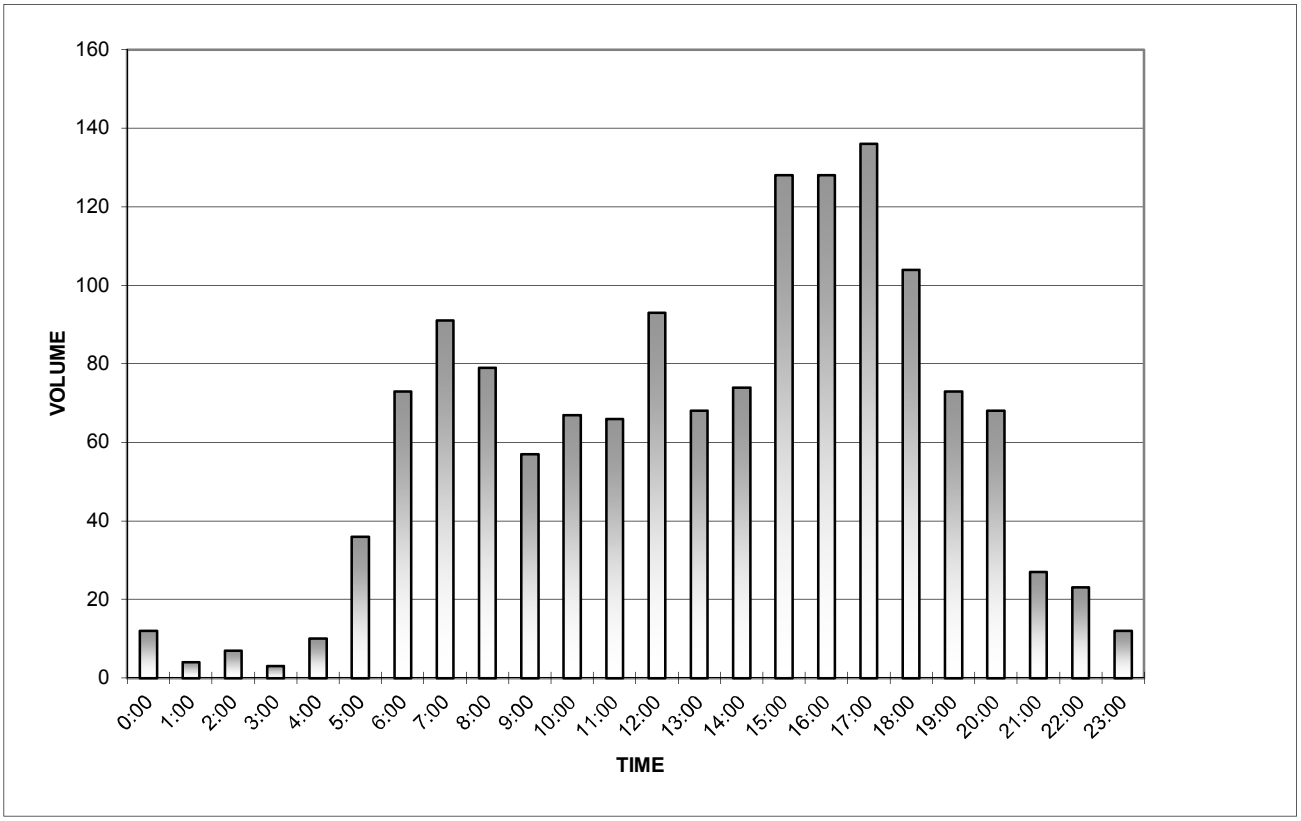
File: C2X3HRS - 4L&12Mv_Peds.XLS

NB FM 718 North of Van Meter Drive

Date Began:
9/23/2015

TIME	0:00	0:15	0:30	0:45	TOTAL
0:00	0	0	6	6	12
1:00	1	1	0	2	4
2:00	1	4	1	1	7
3:00	0	0	2	1	3
4:00	0	2	4	4	10
5:00	5	2	13	16	36
6:00	5	18	30	20	73
7:00	11	26	33	21	91
8:00	21	18	20	20	79
9:00	12	19	12	14	57
10:00	18	9	18	22	67
11:00	20	12	20	14	66
12:00	30	16	27	20	93
13:00	14	18	10	26	68
14:00	18	22	18	16	74
15:00	28	26	32	42	128
16:00	31	34	36	27	128
17:00	32	33	34	37	136
18:00	19	25	32	28	104
19:00	28	18	15	12	73
20:00	15	19	18	16	68
21:00	9	6	5	7	27
22:00	5	9	7	2	23
23:00	4	3	3	2	12
				TOTAL:	1439

The A.M. peak hour from 7:15 to 8:15 is 101
The P.M. peak hour from 15:45 to 16:45 is 143

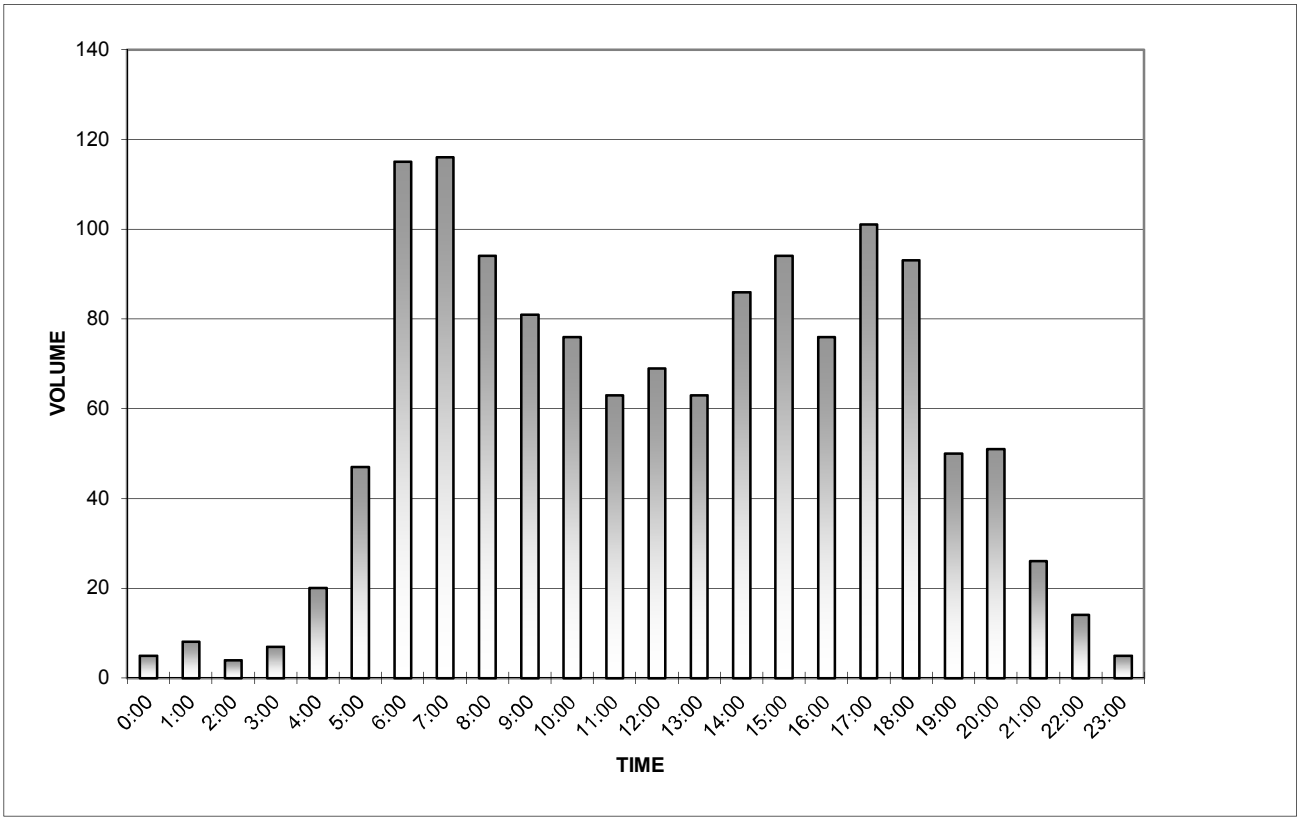


SB FM 718 North of Van Meter Drive

Date Began:
9/23/2015

TIME	0:00	0:15	0:30	0:45	TOTAL
0:00	1	3	0	1	5
1:00	1	2	1	4	8
2:00	1	1	1	1	4
3:00	2	2	2	1	7
4:00	4	6	3	7	20
5:00	2	11	18	16	47
6:00	18	30	33	34	115
7:00	30	39	20	27	116
8:00	26	28	20	20	94
9:00	16	21	24	20	81
10:00	24	18	15	19	76
11:00	8	15	22	18	63
12:00	19	20	16	14	69
13:00	11	12	25	15	63
14:00	24	18	18	26	86
15:00	22	16	15	41	94
16:00	16	22	18	20	76
17:00	30	21	34	16	101
18:00	20	32	22	19	93
19:00	15	10	12	13	50
20:00	14	16	9	12	51
21:00	11	7	5	3	26
22:00	2	8	3	1	14
23:00	1	2	0	2	5
				TOTAL:	1364

The A.M. peak hour from 6:30 to 7:30 is 136
The P.M. peak hour from 16:45 to 17:45 is 105

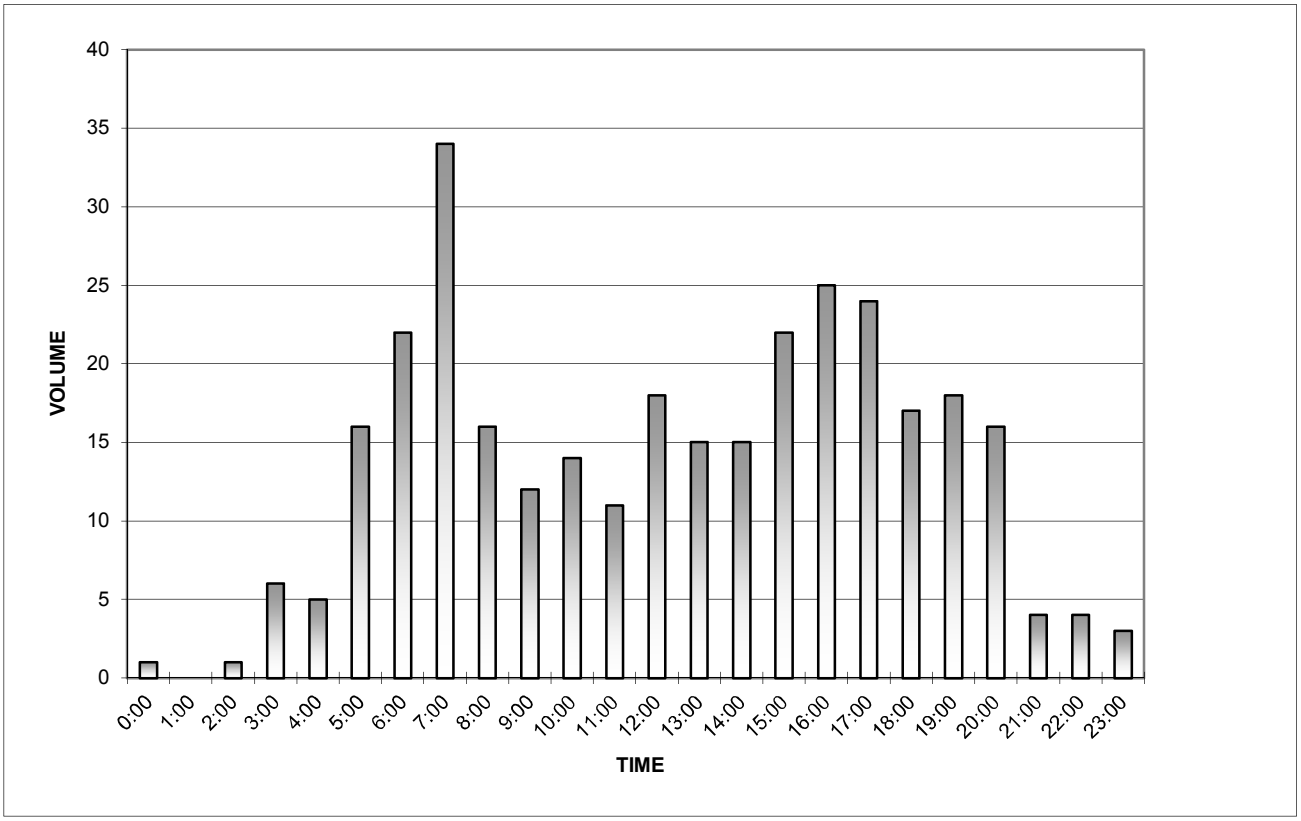


NB Old Base Road North of Bennett Road

Date Began:
9/23/2015

TIME	0:00	0:15	0:30	0:45	TOTAL
0:00	1	0	0	0	1
1:00	0	0	0	0	0
2:00	1	0	0	0	1
3:00	0	2	2	2	6
4:00	0	2	3	0	5
5:00	4	3	0	9	16
6:00	9	3	3	7	22
7:00	4	12	9	9	34
8:00	1	7	5	3	16
9:00	1	4	3	4	12
10:00	3	2	4	5	14
11:00	2	2	4	3	11
12:00	4	3	6	5	18
13:00	2	6	1	6	15
14:00	3	6	2	4	15
15:00	8	5	5	4	22
16:00	8	4	3	10	25
17:00	5	9	6	4	24
18:00	4	7	3	3	17
19:00	6	4	2	6	18
20:00	4	3	7	2	16
21:00	2	1	1	0	4
22:00	3	0	0	1	4
23:00	0	3	0	0	3
				TOTAL:	319

The A.M. peak hour from 7:00 to 8:00 is 34
The P.M. peak hour from 16:45 to 17:45 is 30

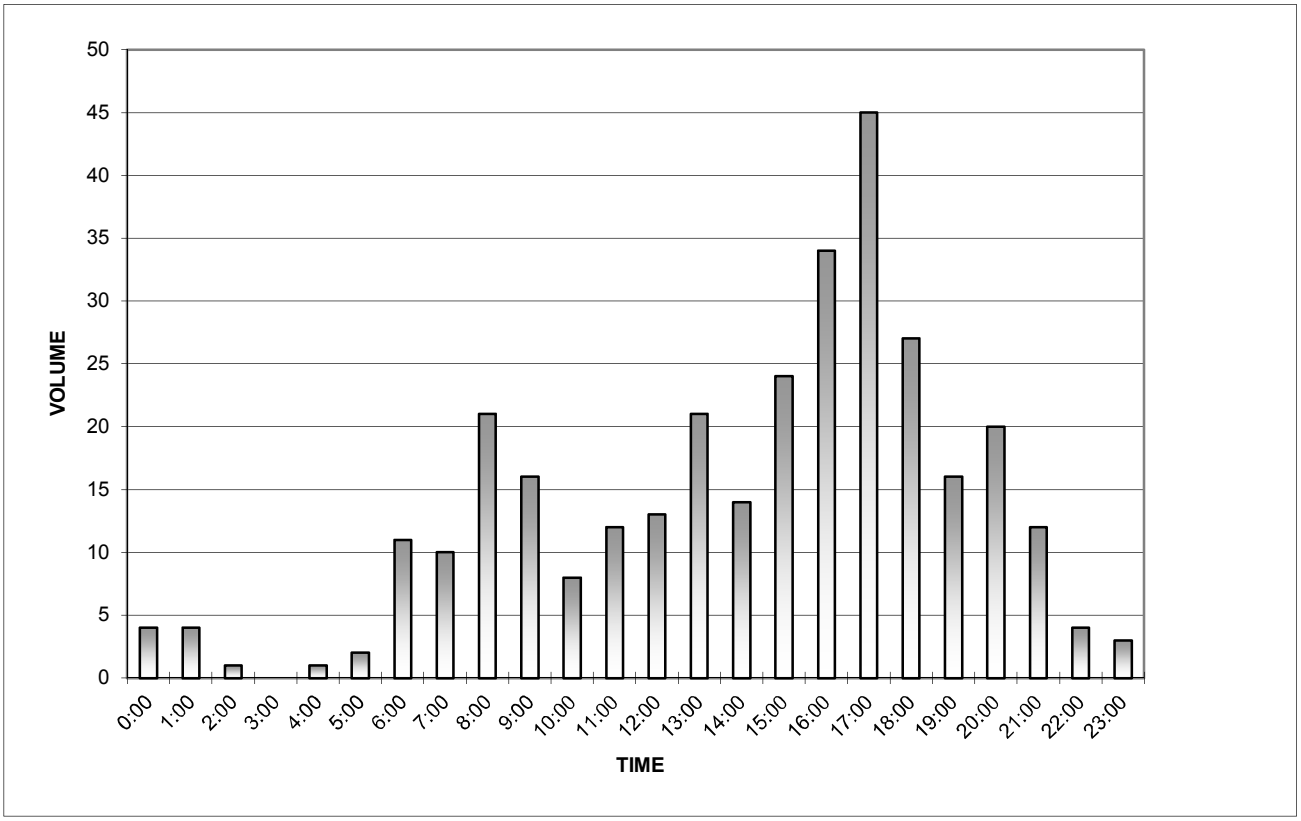


SB Old Base Road North of Bennett Road

Date Began:
9/23/2015

TIME	0:00	0:15	0:30	0:45	TOTAL
0:00	2	2	0	0	4
1:00	0	0	3	1	4
2:00	0	0	1	0	1
3:00	0	0	0	0	0
4:00	0	0	1	0	1
5:00	1	0	1	0	2
6:00	3	3	1	4	11
7:00	3	2	3	2	10
8:00	7	5	6	3	21
9:00	1	3	6	6	16
10:00	0	2	4	2	8
11:00	1	7	3	1	12
12:00	5	1	5	2	13
13:00	5	7	5	4	21
14:00	5	2	6	1	14
15:00	3	2	13	6	24
16:00	6	7	12	9	34
17:00	4	14	16	11	45
18:00	9	6	6	6	27
19:00	3	5	3	5	16
20:00	7	7	4	2	20
21:00	0	7	4	1	12
22:00	2	0	2	0	4
23:00	0	0	2	1	3
				TOTAL:	323

The A.M. peak hour from 8:00 to 9:00 is 21
The P.M. peak hour from 17:15 to 18:15 is 50



Appendix B

Trip Generation Summary - Alternative 1
Average Weekday Driveway Volumes

Project: 15172 | Open Date: 9/30/2015
Alternative: Alternative 1 | Analysis 9/30/2015

ITE	Land Use	Average Daily Trips Enter	Average Daily Trips Exit	Average Daily Trips Total	AM Peak Hour Adjacent Street Traffic Enter	AM Peak Hour Adjacent Street Traffic Exit	AM Peak Hour Adjacent Street Traffic Total	PM Peak Hour Adjacent Street Traffic Enter	PM Peak Hour Adjacent Street Traffic Exit	PM Peak Hour Adjacent Street Traffic Total
210	SFHOUSE 1	2061	2061	4122	80	239	319	252	148	400
	442 Dwelling Units									
Unadjusted Driveway Volume		2061	2061	4122	80	239	319	252	148	400
Unadjusted Pass-By Trips		0	0	0	0	0	0	0	0	0
Internal Capture Trips		0	0	0	0	0	0	0	0	0
Adjusted Driveway Volume		2061	2061	4122	80	239	319	252	148	400
Adjusted Pass-By Trips		0	0	0	0	0	0	0	0	0
Adjusted Volume Added to Adjacent Streets		2061	2061	4122	80	239	319	252	148	400

Total AM Peak Hour Internal Capture = 0 Percent

Total PM Peak Hour Internal Capture = 0 Percent

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

Detailed Land Use Data
For 442 Dwelling Units of SFHOUSE 1
(210) Single-Family Detached Housing

Project: 15172
Phase: Phase 1
Description: TIA

Open Date: 9/30/2015
Analysis Date: 9/30/2015

Day / Period	Total Trips	Pass-By Trips	Avg Rate	Min Rate	Max Rate	Std Dev	Avg Size	% Enter	% Exit	Use Eq.	Equation	R2
Weekday Average Daily Trips	4122	0	9.52	4.31	21.85	3.7	198	50	50	True	Ln(T) = 0.92 Ln(X) + 2.72	0.95
Weekday AM Peak Hour of Adjacent Street Traffic	319	0	0.75	0.33	2.27	0.9	194	25	75	True	T = 0.70(X) + 9.74	0.89
Weekday PM Peak Hour of Adjacent Street Traffic	400	0	1	0.42	2.98	1.05	207	63	37	True	Ln(T) = 0.90 Ln(X) + 0.51	0.91

Appendix C

ROADWAY INTERSECTIONS

[Excerpts from the *Highway Capacity Manual* Transportation Research Board.]

CAPACITY AND LEVEL OF SERVICE CONCEPTS

LEVEL OF SERVICE

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. Level of service (LOS) is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience.

Six LOS are defined for each type of facility that has analysis procedures available. Letters designate each level, from *A* to *F*, with *LOS A* representing the best operating conditions and *LOS F* the worst. Each level of service represents a range of operating conditions and the driver's perception of those conditions. Safety is not included in the measures that establish service levels.

SERVICE FLOW RATES

The analytical methods in this manual attempt to establish or predict the maximum flow rate for various facilities at each level of service—except *LOS F*, for which the flows are unstable or the vehicle delay is high. Thus, each facility has five service flow rates, one for each level of service *(A* through *E*). For *LOS F*, it is difficult to predict flow due to stop-and-start conditions.

The *service flow rate* is the maximum hourly rate at which persons or vehicles reasonably can be expected to traverse a point or uniform segment of a lane or roadway during a given period under prevailing roadway, traffic, and control conditions while maintaining a designated level of service. The service flow rates are generally based upon a 15-minute period. Typically, the hourly flow rate is defined as four times the peak 15-minute volume.

Note that service flow rates are discrete values, whereas levels of service represent a range of conditions. Because the service flow rates are defined as maximums for each level of service, they effectively define flow boundaries between levels of service.

Most design or planning efforts typically use service flow rates at *LOS C* or *D*, to ensure an acceptable operating service for facility users.

SERVICE MEASURES

For each type of facility type, one or more or the stated performance measures serves as the primary determinant of levels of service. This LOS-determining parameter is called the service measure or sometimes the measure of effectiveness (MOE) for each facility type.

SIGNALIZED INTERSECTIONS

SCOPE OF THE METHODOLOGY

This chapter contains a methodology for analyzing the capacity and level of service (LOS) of signalized intersections. The analysis must consider a wide variety of prevailing conditions, including the amount and distribution of traffic movements, traffic composition, geometric characteristics, and details of intersection signalization. The methodology focuses on the determination of LOS for known or projected conditions.

The methodology addresses the capacity, LOS, and other performance measures for lane groups and intersection approaches and the LOS for the intersection as a whole. Capacity is evaluated in terms of the ratio of demand flow rate to capacity (v/c ratio), whereas LOS is evaluated on the basis of control delay per vehicle (in seconds per vehicle). Control delay is the portion of the total delay attributed to traffic signal operation for signalized intersections. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

METHODOLOGY

The primary output of the method is level of service (LOS). This methodology covers a wide range of operational configurations, including combinations of phase plans, lane utilization, and left-turn treatment alternatives. It is important to note that some of these configurations may be considered unacceptable by some operating agencies from a safety point of view. The safety aspect of signalized intersections cannot be ignored, and the provision in this chapter of a capacity and LOS analysis methodology for a specific operational configuration does not imply an endorsement of the suitability for application of such a configuration.

LEVEL-OF-SERVICE

The average control delay per vehicle is estimated for each lane group and aggregated for each approach and for the intersection as a whole. LOS is directly related to the control delay value. The criteria are listed in Exhibit 16-2.

Exhibit 16-2. LOS CRITERIA FOR SIGNALIZED INTERSECTIONS

LOS	CONTROL DELAY PER VEHICLE (s/veh)
A	10
B	> 10-20
C	> 20-35
D	> 35-55
E	> 55-80
F	> 80

INPUT PARAMETERS

This information forms the basis for selecting computational values and procedures in the modules that follow. The data needed are detailed and varied and fall into three main categories: geometric, traffic, and signalization.

INTERPRETATION OF RESULTS

The computations discussed in the previous section result in an estimation of the average delay per vehicle in each lane group for each approach and for the intersection as a whole. LOS is directly related to delay values and is assigned on that basis. LOS is a measure of the acceptability of delay levels to motorists at a given intersection. When delays are unacceptable, the causes of delay should be carefully examined. Although discussion below is clearly not exhaustive, some of the more common situations are as follows.

1. LOS is an indication of the general acceptability of delay to drivers. It should be noted that this is somewhat subjective: what might be acceptable in a large city is not necessarily acceptable in a smaller city or rural area.
2. When delay levels are acceptable for the intersection as a whole but are unacceptable for certain lane groups, the phase plan, allocation of green time, or both might be examined to provide for more efficient handling of the disadvantaged movement or movements.
3. When delay levels are unacceptable but v/c ratios are relatively low, the cycle length may be too long for prevailing conditions, the phase plan may be inefficient, or both. It should be noted, however, that when signals are part of a coordinated system, the cycle length at individual intersections is determined by system considerations, and alterations at isolated locations may not be practical.
4. When both delay levels and v/c ratios are unacceptable, the situation is critical. Delay is already high, and demand is near or over capacity. In such situations, the delay may increase rapidly with small changes in demand. The full range of potential geometric and signal design improvements should be considered in the search for improvements.

The following point must be emphasized: unacceptable delay can exist where capacity is a problem as well as in cases in which it is adequate. Further, acceptable delay levels do not automatically ensure that capacity is sufficient. Delay and LOS, like capacity, are complex variables influenced by a wide range of traffic, roadway, and signalization conditions. The operational analysis techniques presented here are useful in estimating the performance characteristics of the intersection and in providing basic insights into probably causal factors.

The determination of LOS is based on average control delay. It is possible, however, for average delay to decrease with increasing volumes if the volume increased occur in movements with less than the average delay. Even with increases in more than one movement on an approach, the net effect can still be a decrease in average delay if the movements with less than average delay increase sufficiently.

One way to avoid this anomaly is to consider the change in mean delay on a lane-group-by-lane-group basis rather than by averaging delay over the entire intersections. Adding traffic to a particular lane group will always increase the delay for that lane group (as long as all other factors remain unchanged).

These procedures do not, however, account for all possible conditions. The influences of such characteristics as specific curb-corner radii, intersection angle, combinations of grades on various approaches, odd geometric features (offset intersections, narrowing on the departure lanes, etc.), and other unusual site-specific conditions are not addressed in the methodology.

The capacity of an intersection is complex variable depending on a large number of prevailing traffic, roadway, and signalization conditions. Suggestions on interpretation are not meant to be exhaustive or complete but merely to point out some of the more common problems that can be identified from the Capacity and LOS Worksheet results.

UNSIGNALIZED INTERSECTIONS

OVERVIEW

The procedures in this chapter can be used to analyze the capacity and level of service, lane requirements, and effects of traffic and design features of two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections. In addition, a procedure for estimating capacity of roundabouts is presented.

LIMITATIONS OF THE METHODOLOGY

This chapter does not include a detailed method for estimating delay for yield sign-controlled intersections. However, with appropriate changes in the values of key parameters, the analyst could apply the TWSC method to yield-controlled intersections.

All of the methods are for steady-state conditions (i.e., the demand and capacity conditions are constant during the analysis period); the methods are not designed to evaluate how fast or how often the facility transitions from one demand/capacity state to another. Analysts interested in that kind of information should consider applying simulation models.

PART A. TWO-WAY STOP-CONTROLLED INTERSECTIONS

II. METHODOLOGY – PART A

Capacity analysis at TWSC intersections depends on a clear description and understanding of the interaction of drivers on the minor or stop-controlled approach with drivers on the major street. Both gap acceptance and empirical models have been developed to describe this interaction. Procedures described in this chapter rely on a gap acceptance model developed and refined in Germany.

LEVEL-OF-SERVICE CRITERIA

Level of service (LOS) for a TWSC intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS is not defined for the intersection as a whole. LOS criteria are given in Exhibit 17-2.

TABLE 17-2. LOS CRITERIA FOR TWSC INTERSECTIONS

Level of Service	Average Control Delay (s/veh)
A	0-10
B	> 10-15
C	> 15-25
D	> 25-35
E	> 35-50
F	> 50

The LOS criteria for TWSC intersections are somewhat different from the criteria used in Chapter 16 for signalized intersections primarily because different transportation facilities create different driver perceptions. The expectation is that a signalized intersection is designed to carry higher traffic volumes and experience greater delay than an unsignalized intersection.

INPUT DATA REQUIREMENTS

Data requirements for the TWSC intersection methodology are similar to those for other capacity analysis techniques. Detailed descriptions of the geometrics, control, and volumes at the intersection are needed.

Key geometric factors include number and use of lanes, channelization, two-way left-turn lane (TWLTL) or raised or striped median storage (or both), approach grade, and existence of flared approaches on the minor street.

The number and use of lanes are critical factors. Vehicles in adjacent lanes can use the same gap in the traffic street simultaneously (unless impeded by a conflicting user of the gap). When movements share lanes, only one vehicle from those movements can use each gap. A TWLTL or a raised or striped median (or both) allows a minor-stream vehicle to cross one major traffic stream at a time. The grade of the approach has a direct and measurable effect on the capacity of each minor movement. Compared with a level approach, downgrades increase capacity and upgrades decrease capacity. A flared approach on the minor street increases the capacity by allowing more vehicles to be served simultaneously.

Volumes must be specified by movement. For the analysis to reflect conditions during the peak 15 min., the analyst must divide the full hour volumes by the peak-hour factor (PHF) before beginning computations. If the analyst has peak 15-min flow rates, they can be entered directly with the PHF set to 1.0.

The presence of traffic signals upstream from the intersection on the major street will produce nonrandom flows and affect the capacity of the minor-street approaches if the signal is within 0.25 mile of the intersection. The basic capacity model assumes that the headways on the major street are exponentially distributed. To assess the effect on capacity, a separate analysis is provided that requires the signalized intersection data (cycle length, green time), the saturation flow rate, and information on platooned flow.

INTERPRETING RESULTS

Shared Lanes

A movement, most often a left-turn movement, can sometimes have a poorer level of service if it is given a separate lane than if it shares a lane with another movement (usually a through movement). This is not inconsistent in terms of the stated criteria. Left-turn movements will generally experience longer control delays than other movements because of the nature and priority of the movement. If left turns are placed in a shared lane, the control delay for vehicles in that lane may indeed be less than the control delay for left turns in a separate lane. However, if delay for all vehicles is considered, providing separate lanes will result in lower total delay.

Performance Measures

LOS F occurs when there are not enough gaps of suitable size to allow a minor-street demand to safely cross through traffic on the major street. This is typically evident from extremely long control delays experienced by minor-street traffic and by queuing on the minor approaches. The method, however, is based on a constant critical gap size.

LOS F may also appear in the form of drivers on the minor street selecting smaller than usual gaps. In such cases, safety may be a problem, and some disruption to the major traffic stream may result. Note that *LOS F* may not always result in long queues but in adjustments to normal gap acceptance behavior.
At TWSC intersections the critical movement, often the minor-street left turn, may control the overall performance of the intersection. The lower threshold for *LOS F* is set at 50 s of delay per vehicle. In some cases, the delay equations will predict delays greater than 50 s for minor-street movements under very low-volume conditions on the minor street (less than 25 veh/h). Note that the *LOS F* threshold is reached with a movement capacity of approximately 85 veh/h or less.

This analysis procedure assumes random arrivals on the major street. For a typical four-lane major street with average daily traffic volumes in the range of 15,000 to20,000 vehicles per day (peak hour with 1,500 to 2,000 veh/h), the delay equation will predict greater than 50 s of delay (*LOS F*) for many urban TWSC intersections that allow minor-street left-turn movements. *LOS F* will be predicted regardless of the volume of minor-street left-turning traffic. Even with an *LOS F* estimate, most low-volume minor-street approaches would not meet any of the *MUTCD* volume or delay warrants for signalization. As a result, analysts who use the *HCM* LOS thresholds to determine the design adequacy of TWSC intersections should do so with caution.

In evaluating the overall performance of TWSC intersections, it is important to consider measures of effectiveness in addition to delay, such as v/c ratios for individual movements, average queue lengths, and 95th-percentile queue lengths. By focusing on a single measure of effectiveness for the worst movement only, such as delay for the minor-street left turn, users may make less effective traffic control decisions.

PART B. ALL-WAY STOP-CONTROLLED INTERSECTIONS

II. METHODOLOGY – PART B

LEVEL-OF-SERVICE CRITERIA

The criteria for AWSC intersections have different threshold values than do those for signalized intersections primarily because drivers expect different levels of performance from distinct types of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an AWSC intersection. Thus a higher level of control delay is acceptable at a signalized intersection for the same LOS.

TABLE 17-22. LEVEL-OF-SERVICE FOR AWSC INTERSECTIONS

Level of Service	Control Delay (s/veh)
A	0-10
B	> 10-15
C	> 15-25
D	> 25-35
E	> 35-50
F	> 50

OVERVIEW OF METHODOLOGY

The methodology analyzes each intersection approach independently. The approach under study is called the subject approach. The opposing approach and the conflicting approaches create conflicts with vehicles on the subject approach.

AWSC intersections require drivers on all approaches to stop before proceeding into the intersection. While giving priority to the driver on the right is a recognized rule in some areas, it is not a good descriptor of actual intersection operations. What in fact happens is the development of a consensus of right-of-way that alternates between the intersection geometry and the arrival patterns at the stop line.

In summary:

1. AWSC intersections operate in either two-phase or four-phase patterns, based primarily on the complexity of the intersection geometry. Flows are determined by a consensus of right-of-way that alternates between the north/south and east/west streams (for a single-lane approach) or proceeds in turn to each intersection approach (for a multilane approach).
2. The headways between consecutively departing subject approach vehicles depend on the degree of conflict between these vehicles and the vehicles on the other intersection approaches. The degree of conflict is a function of the number of vehicles faced by the subject approach vehicle and of the number of lanes on the intersection approaches.
3. The headway of a subject approach vehicle also depends on its vehicle type and its turning maneuver.

CONTROL DELAY

The delay experienced by a motorist is made up of a number of factors that relate to control, geometrics, traffic, and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, in the absence of incident, control, traffic, or geometric delay.

PLANNING AND DESIGN APPLICATIONS

The operational analysis method described earlier in this chapter provides a detailed procedure for evaluating the performance of an AWSC intersection. To estimate LOS for a future time horizon, a planning analysis based on the operational method is used. The planning method uses all the geometric and traffic flow data required for an operational analysis, and the computations are identical. However, many input variables are estimated (or defaults used) when planning applications are performed.

The operational analysis described earlier in this chapter is not normally used for design purposes. However, through iteration the analyst can use a given set of traffic flow data and determine the number of lanes that would be required to produce a given level of service.

ROADWAY LINKS

*[Derived from the **North Central Texas Council of Governments** (NCTCOG) modeling parameters.]*

For roadway links in this analysis, per-lane link capacities are defined as the values used in regional transportation modeling procedures by NCTCOG. Link capacity is a function of surrounding land development characteristics (e.g., central business district, suburban, etc.) and the functional classification of the roadway (e.g. arterial, local street, etc.). A summary of daily link capacities per lane is provided in the table immediately below. By calculating the ratio of volume to capacity for a roadway link, LOS may be defined. Based upon guidelines established by NCTCOG, LOS criteria are summarized in the second table:

Table A. Daily Roadway Link Service Volumes (Per Lane)
(Derived from parameters used by North Central Texas Council of Governments)

AREA TYPE	ROADWAY FUNCTIONAL CLASSIFICATION				
	Principal Arterial	Minor Arterial	Collector	Local	Frontage Road
CBD	7,250 (6,500)	7,250 (6,500)	4,750 (4,250)	4,750 (4,250)	7,250 (6,500)
CBD Fringe	7,750 (7,250)	7,750 (7,250)	5,000 (4,500)	5,000 (4,500)	7,750 (7,250)
Urban Residential	8,500 (7,750)	8,250 (7,500)	5,250 (4,750)	5,250 (4,750)	8,500 (7,500)
Suburban Residential	9,250 (8,750)	9,000 (8,250)	5,750 (5,250)	5,750 (5,250)	9,000 (8,250)
Rural	10,250 (9,250)	9,750 (8,750)	6,000 (5,500)	6,000 (5,500)	9,750 (8,750)

= Divided or One-Way Roads
(#,###) = Undivided Roads

Table B. Daily Roadway Link Level-of-Service Guidelines
(Derived from parameters used by North Central Texas Council of Governments)

Volume/Capacity Ratio	Level-of-Service
$x \leq 0.65$	A/B/C
$0.65 < x \leq 1.00$	D/E
$x > 1.00$	F

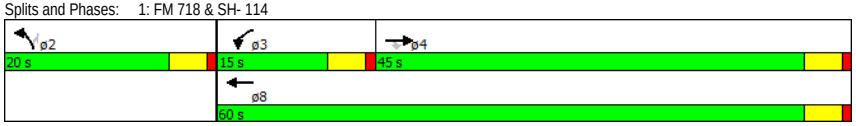
Appendix D

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	429	12	44	244	28	169
Future Volume (vph)	429	12	44	244	28	169
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	477	13	49	271	31	188
Shared Lane Traffic (%)						
Lane Group Flow (vph)	477	13	49	271	31	188
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	20.0	20.0
Total Split (s)	45.0	45.0	15.0	60.0	20.0	20.0
Total Split (%)	56.3%	56.3%	18.8%	75.0%	25.0%	25.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Max	Max	None	Max	None	None
Act Effct Green (s)	47.9	47.9	7.4	55.6	7.4	7.4
Actuated g/C Ratio	0.67	0.67	0.10	0.77	0.10	0.10
v/c Ratio	0.38	0.01	0.27	0.19	0.17	0.57
Control Delay	8.4	4.1	33.6	2.8	31.2	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.4	4.1	33.6	2.8	31.2	12.4
LOS	A	A	C	A	C	B
Approach Delay	8.3			7.5	15.1	
Approach LOS	A			A	B	
Queue Length 50th (ft)	96	0	20	21	13	0
Queue Length 95th (ft)	202	7	51	54	36	53
Internal Link Dist (ft)	322			269	439	
Turn Bay Length (ft)		180	220			200
Base Capacity (vph)	1239	1057	258	1437	381	488
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.01	0.19	0.19	0.08	0.39

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 72	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 9.5	Intersection LOS: A

Intersection Capacity Utilization 42.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: FM 718 & SH- 114



Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	591	13	21	278	13	69
Future Vol, veh/h	591	13	21	278	13	69
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	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	629	14	22	296	14	73

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	643	0	976	636
Stage 1	-	-	-	-	636	-
Stage 2	-	-	-	-	340	-
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	-	-	942	-	279	478
Stage 1	-	-	-	-	527	-
Stage 2	-	-	-	-	721	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	942	-	272	478
Mov Cap-2 Maneuver	-	-	-	-	395	-
Stage 1	-	-	-	-	527	-
Stage 2	-	-	-	-	704	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	14.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	463	-	-	942	-
HCM Lane V/C Ratio	0.188	-	-	0.024	-
HCM Control Delay (s)	14.6	-	-	8.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.7	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	12	4	0	11	6	3
Future Vol, veh/h	12	4	0	11	6	3
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	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	6	0	15	8	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	26	11	13	0	-	0
Stage 1	11	-	-	-	-	-
Stage 2	15	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	989	1070	1606	-	-	-
Stage 1	1012	-	-	-	-	-
Stage 2	1008	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	989	1070	1606	-	-	-
Mov Cap-2 Maneuver	989	-	-	-	-	-
Stage 1	1012	-	-	-	-	-
Stage 2	1008	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1606	-	1008	-	-
HCM Lane V/C Ratio	-	-	0.022	-	-
HCM Control Delay (s)	0	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	9	0	1	2	13	1
Future Vol, veh/h	9	0	1	2	13	1
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	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	0	1	2	15	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	19	15	16	0	-	0
Stage 1	15	-	-	-	-	-
Stage 2	4	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	998	1065	1602	-	-	-
Stage 1	1008	-	-	-	-	-
Stage 2	1019	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	997	1065	1602	-	-	-
Mov Cap-2 Maneuver	997	-	-	-	-	-
Stage 1	1008	-	-	-	-	-
Stage 2	1018	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	2.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1602	-	997	-	-
HCM Lane V/C Ratio	0.001	-	0.01	-	-
HCM Control Delay (s)	7.2	0	8.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	6	86	0	1	3	23	77	0	4	125	2
Future Vol, veh/h	5	6	86	0	1	3	23	77	0	4	125	2
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	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	7	100	0	1	3	27	90	0	5	145	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	301	299	147	352	300	90	148	0	0	90	0	0
Stage 1	156	156	-	143	143	-	-	-	-	-	-	-
Stage 2	145	143	-	209	157	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	651	613	900	603	612	968	1434	-	-	1505	-	-
Stage 1	846	769	-	860	779	-	-	-	-	-	-	-
Stage 2	858	779	-	793	768	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	636	598	900	522	597	968	1434	-	-	1505	-	-
Mov Cap-2 Maneuver	636	598	-	522	597	-	-	-	-	-	-	-
Stage 1	829	766	-	843	763	-	-	-	-	-	-	-
Stage 2	837	763	-	696	765	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.8	9.3	1.7	0.2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1434	-	-	855	838	1505	-	-
HCM Lane V/C Ratio	0.019	-	-	0.132	0.006	0.003	-	-
HCM Control Delay (s)	7.6	0	-	9.8	9.3	7.4	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.5	0	0	-	-

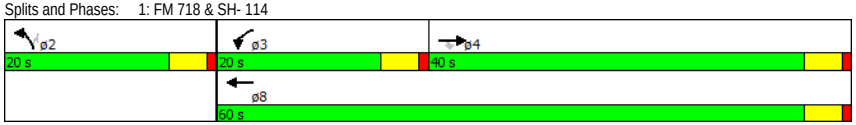
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	286	45	142	490	35	55
Future Volume (vph)	286	45	142	490	35	55
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	308	48	153	527	38	59
Shared Lane Traffic (%)						
Lane Group Flow (vph)	308	48	153	527	38	59
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	20.0	20.0
Total Split (s)	40.0	40.0	20.0	60.0	20.0	20.0
Total Split (%)	50.0%	50.0%	25.0%	75.0%	25.0%	25.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Max	Max	None	Max	None	None
Act Effct Green (s)	40.8	40.8	11.2	57.5	7.0	7.0
Actuated g/C Ratio	0.58	0.58	0.16	0.82	0.10	0.10
v/c Ratio	0.29	0.05	0.54	0.35	0.22	0.28
Control Delay	10.1	3.5	34.6	3.2	32.6	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.1	3.5	34.6	3.2	32.6	12.7
LOS	B	A	C	A	C	B
Approach Delay	9.2			10.3	20.5	
Approach LOS	A			B	C	
Stops (vph)	146	8	124	123	34	16
Fuel Used(gal)	4	0	6	11	1	0
CO Emissions (g/hr)	282	21	394	745	39	32
NOx Emissions (g/hr)	55	4	77	145	8	6
VOC Emissions (g/hr)	65	5	91	173	9	7
Dilemma Vehicles (#)	19	0	0	30	0	0
Queue Length 50th (ft)	66	0	63	51	16	0
Queue Length 95th (ft)	136	16	113	97	42	31
Internal Link Dist (ft)	322			269	439	
Turn Bay Length (ft)		180	220			200

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Base Capacity (vph)	1079	937	390	1522	390	394
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.05	0.39	0.35	0.10	0.15

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 70.4
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 10.8 Intersection LOS: B
Intersection Capacity Utilization 38.3% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: FM 718 & SH- 114



Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	318	24	76	648	20	41
Future Vol, veh/h	318	24	76	648	20	41
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	346	26	83	704	22	45

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	372	0	1229	359
Stage 1	-	-	-	-	359	-
Stage 2	-	-	-	-	870	-
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	-	-	1186	-	196	685
Stage 1	-	-	-	-	707	-
Stage 2	-	-	-	-	410	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1186	-	182	685
Mov Cap-2 Maneuver	-	-	-	-	298	-
Stage 1	-	-	-	-	707	-
Stage 2	-	-	-	-	381	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	13.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	480	-	-	1186	-
HCM Lane V/C Ratio	0.138	-	-	0.07	-
HCM Control Delay (s)	13.7	-	-	8.3	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	6	4	4	18	29	18
Future Vol, veh/h	6	4	4	18	29	18
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	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	5	5	24	38	24

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	84	50	62	0	-	0
Stage 1	50	-	-	-	-	-
Stage 2	34	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	918	1018	1541	-	-	-
Stage 1	972	-	-	-	-	-
Stage 2	988	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	915	1018	1541	-	-	-
Mov Cap-2 Maneuver	915	-	-	-	-	-
Stage 1	972	-	-	-	-	-
Stage 2	985	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	1.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1541	-	954	-	-
HCM Lane V/C Ratio	0.003	-	0.014	-	-
HCM Control Delay (s)	7.3	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	3	0	0	22	14	9
Future Vol, veh/h	3	0	0	22	14	9
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	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	0	0	25	16	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	46	21	26	0	-	0
Stage 1	21	-	-	-	-	-
Stage 2	25	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	964	1056	1588	-	-	-
Stage 1	1002	-	-	-	-	-
Stage 2	998	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	964	1056	1588	-	-	-
Mov Cap-2 Maneuver	964	-	-	-	-	-
Stage 1	1002	-	-	-	-	-
Stage 2	998	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1588	-	964	-	-
HCM Lane V/C Ratio	-	-	0.004	-	-
HCM Control Delay (s)	0	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	4	3	47	0	5	3	93	127	0	2	94	5
Future Vol, veh/h	4	3	47	0	5	3	93	127	0	2	94	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	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	4	57	0	6	4	112	153	0	2	113	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	503	498	116	528	501	153	119	0	0	153	0	0
Stage 1	121	121	-	377	377	-	-	-	-	-	-	-
Stage 2	382	377	-	151	124	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	479	474	936	461	472	893	1469	-	-	1428	-	-
Stage 1	883	796	-	644	616	-	-	-	-	-	-	-
Stage 2	640	616	-	851	793	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	441	434	936	402	432	893	1469	-	-	1428	-	-
Mov Cap-2 Maneuver	441	434	-	402	432	-	-	-	-	-	-	-
Stage 1	810	794	-	591	565	-	-	-	-	-	-	-
Stage 2	578	565	-	794	791	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.8	11.8	3.2	0.1
HCM LOS	A	B		

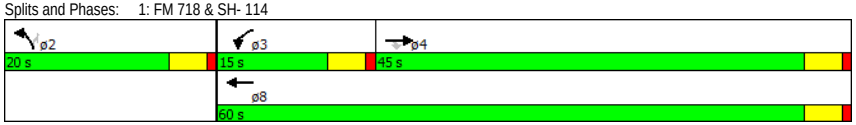
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1469	-	-	816	536	1428	-	-
HCM Lane V/C Ratio	0.076	-	-	0.08	0.018	0.002	-	-
HCM Control Delay (s)	7.7	0	-	9.8	11.8	7.5	0	-
HCM Lane LOS	A	A	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	0.1	0	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	577	16	59	328	38	227
Future Volume (vph)	577	16	59	328	38	227
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	641	18	66	364	42	252
Shared Lane Traffic (%)						
Lane Group Flow (vph)	641	18	66	364	42	252
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	20.0	20.0
Total Split (s)	45.0	45.0	15.0	60.0	20.0	20.0
Total Split (%)	56.3%	56.3%	18.8%	75.0%	25.0%	25.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Max	Max	None	Max	None	None
Act Effct Green (s)	47.5	47.5	8.0	55.6	8.0	8.0
Actuated g/C Ratio	0.65	0.65	0.11	0.77	0.11	0.11
v/c Ratio	0.53	0.02	0.34	0.26	0.22	0.63
Control Delay	11.0	4.1	34.9	3.3	31.6	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	4.1	34.9	3.3	31.6	12.2
LOS	B	A	C	A	C	B
Approach Delay	10.8			8.2	15.0	
Approach LOS	B			A	B	
Stops (vph)	315	4	54	86	35	35
Fuel Used(gal)	9	0	2	7	1	2
CO Emissions (g/hr)	602	9	167	504	41	117
NOx Emissions (g/hr)	117	2	33	98	8	23
VOC Emissions (g/hr)	140	2	39	117	10	27
Dilemma Vehicles (#)	35	0	0	22	0	0
Queue Length 50th (ft)	154	0	27	32	18	0
Queue Length 95th (ft)	326	9	65	81	45	60
Internal Link Dist (ft)	322			269	439	
Turn Bay Length (ft)		180	220			200

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Base Capacity (vph)	1219	1042	256	1427	378	536
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.02	0.26	0.26	0.11	0.47

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 72.6	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 51.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: FM 718 & SH- 114



Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	794	17	28	374	17	93
Future Vol, veh/h	794	17	28	374	17	93
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	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	845	18	30	398	18	99

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	863	0	1311	854
Stage 1	-	-	-	-	854	-
Stage 2	-	-	-	-	457	-
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	-	-	779	-	175	358
Stage 1	-	-	-	-	417	-
Stage 2	-	-	-	-	638	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	779	-	168	358
Mov Cap-2 Maneuver	-	-	-	-	299	-
Stage 1	-	-	-	-	417	-
Stage 2	-	-	-	-	613	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	20.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	347	-	-	779	-
HCM Lane V/C Ratio	0.337	-	-	0.038	-
HCM Control Delay (s)	20.6	-	-	9.8	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	16	5	0	15	8	4
Future Vol, veh/h	16	5	0	15	8	4
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	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	7	0	21	11	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	35	14	17	0	-	0
Stage 1	14	-	-	-	-	-
Stage 2	21	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	978	1066	1600	-	-	-
Stage 1	1009	-	-	-	-	-
Stage 2	1002	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	978	1066	1600	-	-	-
Mov Cap-2 Maneuver	978	-	-	-	-	-
Stage 1	1009	-	-	-	-	-
Stage 2	1002	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1600	-	998	-	-
HCM Lane V/C Ratio	-	-	0.03	-	-
HCM Control Delay (s)	0	-	8.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	12	0	1	3	17	1
Future Vol, veh/h	12	0	1	3	17	1
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	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	0	1	3	19	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	26	20	20	0	-	0
Stage 1	20	-	-	-	-	-
Stage 2	6	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	989	1058	1596	-	-	-
Stage 1	1003	-	-	-	-	-
Stage 2	1017	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	988	1058	1596	-	-	-
Mov Cap-2 Maneuver	988	-	-	-	-	-
Stage 1	1003	-	-	-	-	-
Stage 2	1016	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	1.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1596	-	988	-	-
HCM Lane V/C Ratio	0.001	-	0.014	-	-
HCM Control Delay (s)	7.3	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	7	8	116	0	1	4	31	103	0	5	168	3
Future Vol, veh/h	7	8	116	0	1	4	31	103	0	5	168	3
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	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	9	135	0	1	5	36	120	0	6	195	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	404	401	197	473	402	120	199	0	0	120	0	0
Stage 1	209	209	-	192	192	-	-	-	-	-	-	-
Stage 2	195	192	-	281	210	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	557	538	844	501	537	931	1373	-	-	1468	-	-
Stage 1	793	729	-	810	742	-	-	-	-	-	-	-
Stage 2	807	742	-	726	728	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	539	520	844	405	519	931	1373	-	-	1468	-	-
Mov Cap-2 Maneuver	539	520	-	405	519	-	-	-	-	-	-	-
Stage 1	771	725	-	787	721	-	-	-	-	-	-	-
Stage 2	779	721	-	599	724	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.6	9.5	1.8	0.2
HCM LOS	B	A		

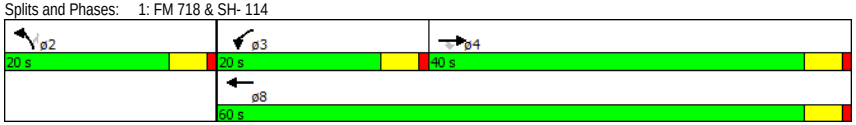
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1373	-	-	790	803	1468	-	-
HCM Lane V/C Ratio	0.026	-	-	0.193	0.007	0.004	-	-
HCM Control Delay (s)	7.7	0	-	10.6	9.5	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.7	0	0	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	384	60	191	659	47	74
Future Volume (vph)	384	60	191	659	47	74
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	413	65	205	709	51	80
Shared Lane Traffic (%)						
Lane Group Flow (vph)	413	65	205	709	51	80
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	20.0	20.0
Total Split (s)	40.0	40.0	20.0	60.0	20.0	20.0
Total Split (%)	50.0%	50.0%	25.0%	75.0%	25.0%	25.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Max	Max	None	Max	None	None
Act Effct Green (s)	38.7	38.7	12.6	56.9	7.5	7.5
Actuated g/C Ratio	0.55	0.55	0.18	0.81	0.11	0.11
v/c Ratio	0.40	0.07	0.64	0.47	0.27	0.33
Control Delay	12.4	3.4	36.9	4.3	33.3	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.4	3.4	36.9	4.3	33.3	12.0
LOS	B	A	D	A	C	B
Approach Delay	11.2			11.6	20.3	
Approach LOS	B			B	C	
Stops (vph)	220	9	169	200	43	19
Fuel Used(gal)	6	0	8	15	1	1
CO Emissions (g/hr)	422	25	539	1057	52	41
NOx Emissions (g/hr)	82	5	105	206	10	8
VOC Emissions (g/hr)	98	6	125	245	12	9
Dilemma Vehicles (#)	25	0	0	39	0	0
Queue Length 50th (ft)	104	0	85	83	21	0
Queue Length 95th (ft)	194	18	150	162	52	36
Internal Link Dist (ft)	322			269	439	
Turn Bay Length (ft)		180	220			200

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Base Capacity (vph)	1028	903	393	1512	393	414
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.07	0.52	0.47	0.13	0.19

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 70.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 12.2	Intersection LOS: B
Intersection Capacity Utilization 46.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: FM 718 & SH- 114



Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	427	32	102	871	27	55
Future Vol, veh/h	427	32	102	871	27	55
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	464	35	111	947	29	60

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	499	0	1650	482
Stage 1	-	-	-	-	482	-
Stage 2	-	-	-	-	1168	-
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	-	-	1065	-	109	584
Stage 1	-	-	-	-	621	-
Stage 2	-	-	-	-	296	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1065	-	98	584
Mov Cap-2 Maneuver	-	-	-	-	205	-
Stage 1	-	-	-	-	621	-
Stage 2	-	-	-	-	265	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	18.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	363	-	-	1065	-
HCM Lane V/C Ratio	0.246	-	-	0.104	-
HCM Control Delay (s)	18.1	-	-	8.8	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1	-	-	0.3	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	8	5	5	24	39	24
Future Vol, veh/h	8	5	5	24	39	24
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	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	7	7	32	51	32

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	112	67	83	0	-	0
Stage 1	67	-	-	-	-	-
Stage 2	45	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	885	997	1514	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	977	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	881	997	1514	-	-	-
Mov Cap-2 Maneuver	881	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	972	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	1.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1514	-	922	-	-
HCM Lane V/C Ratio	0.004	-	0.019	-	-
HCM Control Delay (s)	7.4	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	4	0	0	30	19	12
Future Vol, veh/h	4	0	0	30	19	12
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	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	0	0	34	22	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	62	28	35	0	-	0
Stage 1	28	-	-	-	-	-
Stage 2	34	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	944	1047	1576	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	988	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	944	1047	1576	-	-	-
Mov Cap-2 Maneuver	944	-	-	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	988	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1576	-	944	-	-
HCM Lane V/C Ratio	-	-	0.005	-	-
HCM Control Delay (s)	0	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	4	63	0	7	4	125	171	0	3	126	7
Future Vol, veh/h	5	4	63	0	7	4	125	171	0	3	126	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	5	76	0	8	5	151	206	0	4	152	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	677	670	156	711	674	206	160	0	0	206	0	0
Stage 1	163	163	-	507	507	-	-	-	-	-	-	-
Stage 2	514	507	-	204	167	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	367	378	890	348	376	835	1419	-	-	1365	-	-
Stage 1	839	763	-	548	539	-	-	-	-	-	-	-
Stage 2	543	539	-	798	760	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	324	332	890	285	330	835	1419	-	-	1365	-	-
Mov Cap-2 Maneuver	324	332	-	285	330	-	-	-	-	-	-	-
Stage 1	738	761	-	482	474	-	-	-	-	-	-	-
Stage 2	467	474	-	723	758	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.6	13.8	3.3	0.2
HCM LOS	B	B		

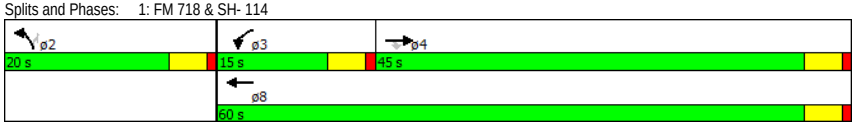
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1419	-	-	733	423	1365	-	-
HCM Lane V/C Ratio	0.106	-	-	0.118	0.031	0.003	-	-
HCM Control Delay (s)	7.8	0	-	10.6	13.8	7.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.4	0.1	0	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	577	16	83	328	38	299
Future Volume (vph)	577	16	83	328	38	299
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	641	18	92	364	42	332
Shared Lane Traffic (%)						
Lane Group Flow (vph)	641	18	92	364	42	332
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	20.0	20.0
Total Split (s)	45.0	45.0	15.0	60.0	20.0	20.0
Total Split (%)	56.3%	56.3%	18.8%	75.0%	25.0%	25.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Max	Max	None	Max	None	None
Act Effct Green (s)	44.6	44.6	8.7	55.6	8.5	8.5
Actuated g/C Ratio	0.61	0.61	0.12	0.76	0.12	0.12
v/c Ratio	0.56	0.02	0.44	0.26	0.21	0.70
Control Delay	13.1	4.4	37.2	3.6	30.9	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	4.4	37.2	3.6	30.9	12.3
LOS	B	A	D	A	C	B
Approach Delay	12.8			10.4	14.4	
Approach LOS	B			B	B	
Stops (vph)	349	4	73	88	33	42
Fuel Used(gal)	9	0	3	7	1	2
CO Emissions (g/hr)	663	9	234	508	40	153
NOx Emissions (g/hr)	129	2	46	99	8	30
VOC Emissions (g/hr)	154	2	54	118	9	35
Dilemma Vehicles (#)	36	0	0	22	0	0
Queue Length 50th (ft)	160	0	38	32	18	0
Queue Length 95th (ft)	344	10	87	90	44	67
Internal Link Dist (ft)	322			269	439	
Turn Bay Length (ft)		180	220			200

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Base Capacity (vph)	1136	973	254	1417	376	597
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.02	0.36	0.26	0.11	0.56

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 73.1	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 12.5	Intersection LOS: B
Intersection Capacity Utilization 56.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: FM 718 & SH- 114



Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	866	17	40	398	17	129
Future Vol, veh/h	866	17	40	398	17	129
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	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	921	18	43	423	18	137

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	939	0	1439	930
Stage 1	-	-	-	-	930	-
Stage 2	-	-	-	-	509	-
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	-	-	730	-	146	324
Stage 1	-	-	-	-	384	-
Stage 2	-	-	-	-	604	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	730	-	137	324
Mov Cap-2 Maneuver	-	-	-	-	268	-
Stage 1	-	-	-	-	384	-
Stage 2	-	-	-	-	568	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	26.9
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	316	-	-	730	-
HCM Lane V/C Ratio	0.492	-	-	0.058	-
HCM Control Delay (s)	26.9	-	-	10.2	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.6	-	-	0.2	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	28	5	0	39	16	8
Future Vol, veh/h	28	5	0	39	16	8
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	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	7	0	55	23	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	83	28	34	0	-	0
Stage 1	28	-	-	-	-	-
Stage 2	55	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	919	1047	1578	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	968	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	919	1047	1578	-	-	-
Mov Cap-2 Maneuver	919	-	-	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	968	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1578	-	936	-	-
HCM Lane V/C Ratio	-	-	0.05	-	-
HCM Control Delay (s)	0	-	9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	22	0	4	4	0	12
Future Vol, veh/h	22	0	4	4	0	12
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	0	4	4	0	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	24	0	37	24
Stage 1	-	-	-	-	24	-
Stage 2	-	-	-	-	13	-
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	-	-	1591	-	975	1052
Stage 1	-	-	-	-	999	-
Stage 2	-	-	-	-	1010	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1591	-	972	1052
Mov Cap-2 Maneuver	-	-	-	-	972	-
Stage 1	-	-	-	-	999	-
Stage 2	-	-	-	-	1007	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.6	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1052	-	-	1591	-
HCM Lane V/C Ratio	0.012	-	-	0.003	-
HCM Control Delay (s)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	24	24	8	15	24	8
Future Vol, veh/h	24	24	8	15	24	8
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	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	26	9	16	26	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	64	30	35	0	-	0
Stage 1	30	-	-	-	-	-
Stage 2	34	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	942	1044	1576	-	-	-
Stage 1	993	-	-	-	-	-
Stage 2	988	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	936	1044	1576	-	-	-
Mov Cap-2 Maneuver	936	-	-	-	-	-
Stage 1	993	-	-	-	-	-
Stage 2	982	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	2.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1576	-	987	-	-
HCM Lane V/C Ratio	0.006	-	0.053	-	-
HCM Control Delay (s)	7.3	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	12	12	5	11	41	1
Future Vol, veh/h	12	12	5	11	41	1
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	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	13	6	12	46	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	71	47	47	0	-	0
Stage 1	47	-	-	-	-	-
Stage 2	24	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	933	1022	1560	-	-	-
Stage 1	975	-	-	-	-	-
Stage 2	999	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	929	1022	1560	-	-	-
Mov Cap-2 Maneuver	929	-	-	-	-	-
Stage 1	975	-	-	-	-	-
Stage 2	995	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	2.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1560	-	973	-	-
HCM Lane V/C Ratio	0.004	-	0.028	-	-
HCM Control Delay (s)	7.3	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	8	13	5	4	12	24
Future Vol, veh/h	8	13	5	4	12	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	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	14	5	4	13	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	10	0	-	0	40	8
Stage 1	-	-	-	-	8	-
Stage 2	-	-	-	-	32	-
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	1610	-	-	-	972	1074
Stage 1	-	-	-	-	1015	-
Stage 2	-	-	-	-	991	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1610	-	-	-	966	1074
Mov Cap-2 Maneuver	-	-	-	-	966	-
Stage 1	-	-	-	-	1015	-
Stage 2	-	-	-	-	985	-

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1610	-	-	-	1035
HCM Lane V/C Ratio	0.005	-	-	-	0.038
HCM Control Delay (s)	7.2	0	-	-	8.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	7	8	116	12	1	16	31	131	4	9	252	3
Future Vol, veh/h	7	8	116	12	1	16	31	131	4	9	252	3
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	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	9	135	14	1	19	36	152	5	10	293	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	553	545	295	615	544	155	297	0	0	157	0	0
Stage 1	316	316	-	227	227	-	-	-	-	-	-	-
Stage 2	237	229	-	388	317	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	444	446	744	403	446	891	1264	-	-	1423	-	-
Stage 1	695	655	-	776	716	-	-	-	-	-	-	-
Stage 2	766	715	-	636	654	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	421	429	744	315	429	891	1264	-	-	1423	-	-
Mov Cap-2 Maneuver	421	429	-	315	429	-	-	-	-	-	-	-
Stage 1	673	650	-	752	694	-	-	-	-	-	-	-
Stage 2	726	693	-	509	649	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.8	12.8	1.5	0.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1264	-	-	685	497	1423	-	-
HCM Lane V/C Ratio	0.029	-	-	0.222	0.068	0.007	-	-
HCM Control Delay (s)	7.9	0	-	11.8	12.8	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.8	0.2	0	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	84	60	126	28	20	180
Future Vol, veh/h	84	60	126	28	20	180
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	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	91	65	137	30	22	196

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	391	152	0	0	167	0
Stage 1	152	-	-	-	-	-
Stage 2	239	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	613	894	-	-	1411	-
Stage 1	876	-	-	-	-	-
Stage 2	801	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	603	894	-	-	1411	-
Mov Cap-2 Maneuver	603	-	-	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	787	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	0.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	698	1411	-
HCM Lane V/C Ratio	-	-	0.224	0.015	-
HCM Control Delay (s)	-	-	11.6	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0	-

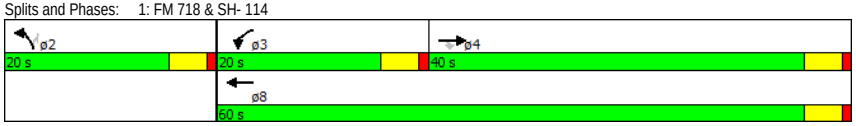
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	384	60	266	659	47	118
Future Volume (vph)	384	60	266	659	47	118
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	413	65	286	709	51	127
Shared Lane Traffic (%)						
Lane Group Flow (vph)	413	65	286	709	51	127
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	20.0	20.0
Total Split (s)	40.0	40.0	20.0	60.0	20.0	20.0
Total Split (%)	50.0%	50.0%	25.0%	75.0%	25.0%	25.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Max	Max	None	Max	None	None
Act Effct Green (s)	36.7	36.7	14.6	56.9	7.5	7.5
Actuated g/C Ratio	0.52	0.52	0.21	0.81	0.11	0.11
v/c Ratio	0.42	0.08	0.78	0.47	0.27	0.45
Control Delay	13.4	3.4	43.4	4.3	33.2	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	3.4	43.4	4.3	33.2	11.8
LOS	B	A	D	A	C	B
Approach Delay	12.1			15.5	18.0	
Approach LOS	B			B	B	
Stops (vph)	232	9	229	201	43	23
Fuel Used(gal)	6	0	11	15	1	1
CO Emissions (g/hr)	443	25	767	1058	52	62
NOx Emissions (g/hr)	86	5	149	206	10	12
VOC Emissions (g/hr)	103	6	178	245	12	14
Dilemma Vehicles (#)	27	0	0	39	0	0
Queue Length 50th (ft)	112	0	120	83	21	0
Queue Length 95th (ft)	195	18	#243	164	52	45
Internal Link Dist (ft)	322			269	439	
Turn Bay Length (ft)		180	220			200

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Base Capacity (vph)	975	859	393	1512	393	451
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.08	0.73	0.47	0.13	0.28

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 70.1
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 14.8 Intersection LOS: B
Intersection Capacity Utilization 50.4% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: FM 718 & SH- 114



Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	472	32	140	946	27	77
Future Vol, veh/h	472	32	140	946	27	77
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	513	35	152	1028	29	84

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	548	0	1863	530
Stage 1	-	-	-	-	530	-
Stage 2	-	-	-	-	1333	-
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	-	-	1021	-	80	549
Stage 1	-	-	-	-	590	-
Stage 2	-	-	-	-	246	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1021	-	68	549
Mov Cap-2 Maneuver	-	-	-	-	163	-
Stage 1	-	-	-	-	590	-
Stage 2	-	-	-	-	209	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	20.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	340	-	-	1021	-
HCM Lane V/C Ratio	0.332	-	-	0.149	-
HCM Control Delay (s)	20.8	-	-	9.1	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.4	-	-	0.5	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	15	5	5	39	64	37
Future Vol, veh/h	15	5	5	39	64	37
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	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	7	7	51	84	49

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	173	109	133	0	-	0
Stage 1	109	-	-	-	-	-
Stage 2	64	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	817	945	1452	-	-	-
Stage 1	916	-	-	-	-	-
Stage 2	959	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	813	945	1452	-	-	-
Mov Cap-2 Maneuver	813	-	-	-	-	-
Stage 1	916	-	-	-	-	-
Stage 2	954	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1452	-	842	-	-
HCM Lane V/C Ratio	0.005	-	0.031	-	-
HCM Control Delay (s)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	13	0	13	30	0	7
Future Vol, veh/h	13	0	13	30	0	7
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	0	14	33	0	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	14	0	75	14
Stage 1	-	-	-	-	14	-
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	-	-	1604	-	928	1066
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	962	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1604	-	920	1066
Mov Cap-2 Maneuver	-	-	-	-	920	-
Stage 1	-	-	-	-	1009	-
Stage 2	-	-	-	-	953	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.2	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1066	-	-	1604	-
HCM Lane V/C Ratio	0.007	-	-	0.009	-
HCM Control Delay (s)	8.4	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	15	15	25	34	44	25
Future Vol, veh/h	15	15	25	34	44	25
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	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	16	27	37	48	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	152	61	75	0	-	0
Stage 1	61	-	-	-	-	-
Stage 2	91	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	840	1004	1524	-	-	-
Stage 1	962	-	-	-	-	-
Stage 2	933	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	825	1004	1524	-	-	-
Mov Cap-2 Maneuver	825	-	-	-	-	-
Stage 1	962	-	-	-	-	-
Stage 2	916	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	3.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1524	-	906	-	-
HCM Lane V/C Ratio	0.018	-	0.036	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	4	7	13	55	34	12
Future Vol, veh/h	4	7	13	55	34	12
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	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	8	15	63	39	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	137	45	52	0	-	0
Stage 1	45	-	-	-	-	-
Stage 2	92	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	856	1025	1554	-	-	-
Stage 1	977	-	-	-	-	-
Stage 2	932	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	847	1025	1554	-	-	-
Mov Cap-2 Maneuver	847	-	-	-	-	-
Stage 1	977	-	-	-	-	-
Stage 2	923	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	1.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1554	-	952	-	-
HCM Lane V/C Ratio	0.01	-	0.013	-	-
HCM Control Delay (s)	7.3	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	25	4	12	13	7	15
Future Vol, veh/h	25	4	12	13	7	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	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	4	13	14	8	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	27	0	-	0	79	20
Stage 1	-	-	-	-	20	-
Stage 2	-	-	-	-	59	-
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	1587	-	-	-	924	1058
Stage 1	-	-	-	-	1003	-
Stage 2	-	-	-	-	964	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1587	-	-	-	908	1058
Mov Cap-2 Maneuver	-	-	-	-	908	-
Stage 1	-	-	-	-	1003	-
Stage 2	-	-	-	-	948	-

Approach	EB	WB	SB
HCM Control Delay, s	6.3	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1587	-	-	-	1005
HCM Lane V/C Ratio	0.017	-	-	-	0.024
HCM Control Delay (s)	7.3	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	5	4	63	7	7	11	125	259	13	15	178	7
Future Vol, veh/h	5	4	63	7	7	11	125	259	13	15	178	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	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	5	76	8	8	13	151	312	16	18	214	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	887	884	219	916	880	320	223	0	0	328	0	0
Stage 1	255	255	-	621	621	-	-	-	-	-	-	-
Stage 2	632	629	-	295	259	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	265	284	821	253	286	721	1346	-	-	1232	-	-
Stage 1	749	696	-	475	479	-	-	-	-	-	-	-
Stage 2	468	475	-	713	694	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	224	241	821	200	243	721	1346	-	-	1232	-	-
Mov Cap-2 Maneuver	224	241	-	200	243	-	-	-	-	-	-	-
Stage 1	646	684	-	410	413	-	-	-	-	-	-	-
Stage 2	388	410	-	632	682	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.7	17.6	2.5	0.6
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1346	-	-	623	316	1232	-	-
HCM Lane V/C Ratio	0.112	-	-	0.139	0.095	0.015	-	-
HCM Control Delay (s)	8	0	-	11.7	17.6	8	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.5	0.3	0	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	52	37	187	88	63	148
Future Vol, veh/h	52	37	187	88	63	148
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	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	40	203	96	68	161

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	549	251	0	0	299	0
Stage 1	251	-	-	-	-	-
Stage 2	298	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	497	788	-	-	1262	-
Stage 1	791	-	-	-	-	-
Stage 2	753	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	468	788	-	-	1262	-
Mov Cap-2 Maneuver	468	-	-	-	-	-
Stage 1	791	-	-	-	-	-
Stage 2	709	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.7	0	2.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	563	1262	-
HCM Lane V/C Ratio	-	-	0.172	0.054	-
HCM Control Delay (s)	-	-	12.7	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.2	-

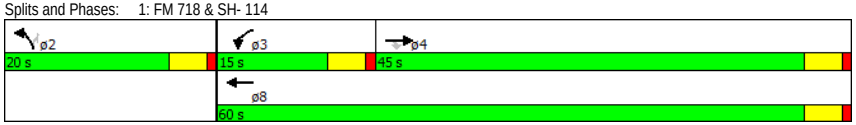
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	668	19	69	380	44	263
Future Volume (vph)	668	19	69	380	44	263
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	742	21	77	422	49	292
Shared Lane Traffic (%)						
Lane Group Flow (vph)	742	21	77	422	49	292
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	20.0	20.0
Total Split (s)	45.0	45.0	15.0	60.0	20.0	20.0
Total Split (%)	56.3%	56.3%	18.8%	75.0%	25.0%	25.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Max	Max	None	Max	None	None
Act Effct Green (s)	44.9	44.9	8.2	55.6	8.3	8.3
Actuated g/C Ratio	0.62	0.62	0.11	0.76	0.11	0.11
v/c Ratio	0.65	0.02	0.39	0.30	0.24	0.67
Control Delay	14.6	4.1	36.1	3.7	31.9	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.6	4.1	36.1	3.7	31.9	12.1
LOS	B	A	D	A	C	B
Approach Delay	14.3			8.7	15.0	
Approach LOS	B			A	B	
Stops (vph)	430	5	62	104	40	38
Fuel Used(gal)	12	0	3	8	1	2
CO Emissions (g/hr)	816	11	195	592	48	134
NOx Emissions (g/hr)	159	2	38	115	9	26
VOC Emissions (g/hr)	189	3	45	137	11	31
Dilemma Vehicles (#)	40	0	0	26	0	0
Queue Length 50th (ft)	200	0	32	40	20	0
Queue Length 95th (ft)	424	10	75	102	50	63
Internal Link Dist (ft)	322			269	439	
Turn Bay Length (ft)		180	220			200

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Base Capacity (vph)	1148	983	255	1420	376	566
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.02	0.30	0.30	0.13	0.52

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 72.9
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 12.7 Intersection LOS: B
Intersection Capacity Utilization 58.9% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: FM 718 & SH- 114



Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	921	20	33	433	20	107
Future Vol, veh/h	921	20	33	433	20	107
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	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	980	21	35	461	21	114

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1001	0	1521	990
Stage 1	-	-	-	-	990	-
Stage 2	-	-	-	-	531	-
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	-	-	692	-	130	299
Stage 1	-	-	-	-	360	-
Stage 2	-	-	-	-	590	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	692	-	123	299
Mov Cap-2 Maneuver	-	-	-	-	253	-
Stage 1	-	-	-	-	360	-
Stage 2	-	-	-	-	560	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	27.7
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	291	-	-	692	-
HCM Lane V/C Ratio	0.464	-	-	0.051	-
HCM Control Delay (s)	27.7	-	-	10.5	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.3	-	-	0.2	-

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	19	6	0	17	9	5
Future Vol, veh/h	19	6	0	17	9	5
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	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	8	0	24	13	7

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	40	16	20	0	-	0
Stage 1	16	-	-	-	-	-
Stage 2	24	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	972	1063	1596	-	-	-
Stage 1	1007	-	-	-	-	-
Stage 2	999	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	972	1063	1596	-	-	-
Mov Cap-2 Maneuver	972	-	-	-	-	-
Stage 1	1007	-	-	-	-	-
Stage 2	999	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1596	-	992	-	-
HCM Lane V/C Ratio	-	-	0.035	-	-
HCM Control Delay (s)	0	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	14	0	2	3	20	2
Future Vol, veh/h	14	0	2	3	20	2
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	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	0	2	3	22	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	32	24	25	0	-	0
Stage 1	24	-	-	-	-	-
Stage 2	8	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	982	1052	1589	-	-	-
Stage 1	999	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	981	1052	1589	-	-	-
Mov Cap-2 Maneuver	981	-	-	-	-	-
Stage 1	999	-	-	-	-	-
Stage 2	1014	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	2.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1589	-	981	-	-
HCM Lane V/C Ratio	0.001	-	0.016	-	-
HCM Control Delay (s)	7.3	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	8	9	134	0	2	5	36	120	0	6	195	3
Future Vol, veh/h	8	9	134	0	2	5	36	120	0	6	195	3
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	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	10	156	0	2	6	42	140	0	7	227	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	469	465	228	549	467	140	230	0	0	140	0	0
Stage 1	242	242	-	223	223	-	-	-	-	-	-	-
Stage 2	227	223	-	326	244	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	505	495	811	446	493	908	1338	-	-	1443	-	-
Stage 1	762	705	-	780	719	-	-	-	-	-	-	-
Stage 2	776	719	-	687	704	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	485	475	811	344	473	908	1338	-	-	1443	-	-
Mov Cap-2 Maneuver	485	475	-	344	473	-	-	-	-	-	-	-
Stage 1	736	701	-	753	695	-	-	-	-	-	-	-
Stage 2	742	695	-	543	700	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.2	10.1	1.8	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1338	-	-	752	719	1443	-	-
HCM Lane V/C Ratio	0.031	-	-	0.233	0.011	0.005	-	-
HCM Control Delay (s)	7.8	0	-	11.2	10.1	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.9	0	0	-	-

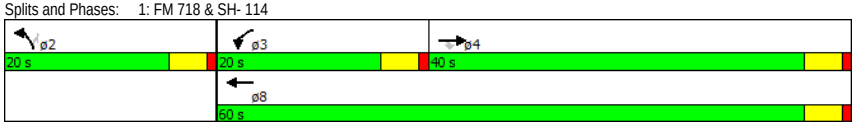
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	446	70	221	763	55	86
Future Volume (vph)	446	70	221	763	55	86
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	480	75	238	820	59	92
Shared Lane Traffic (%)						
Lane Group Flow (vph)	480	75	238	820	59	92
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	20.0	20.0
Total Split (s)	40.0	40.0	20.0	60.0	20.0	20.0
Total Split (%)	50.0%	50.0%	25.0%	75.0%	25.0%	25.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Max	Max	None	Max	None	None
Act Effct Green (s)	37.9	37.9	13.5	56.9	7.8	7.8
Actuated g/C Ratio	0.54	0.54	0.19	0.81	0.11	0.11
v/c Ratio	0.48	0.08	0.70	0.54	0.30	0.36
Control Delay	14.0	3.3	39.3	5.2	33.7	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	3.3	39.3	5.2	33.7	11.6
LOS	B	A	D	A	C	B
Approach Delay	12.6			12.9	20.3	
Approach LOS	B			B	C	
Stops (vph)	278	10	195	266	48	20
Fuel Used(gal)	8	0	9	18	1	1
CO Emissions (g/hr)	529	29	631	1278	60	46
NOx Emissions (g/hr)	103	6	123	249	12	9
VOC Emissions (g/hr)	123	7	146	296	14	11
Dilemma Vehicles (#)	29	0	0	45	0	0
Queue Length 50th (ft)	136	0	98	110	25	0
Queue Length 95th (ft)	237	20	#180	217	58	38
Internal Link Dist (ft)	322			269	439	
Turn Bay Length (ft)		180	220			200

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Base Capacity (vph)	1002	886	392	1506	392	422
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.08	0.61	0.54	0.15	0.22

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 70.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 13.4 Intersection LOS: B
Intersection Capacity Utilization 51.8% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: FM 718 & SH- 114



Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	495	37	118	1010	31	64
Future Vol, veh/h	495	37	118	1010	31	64
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	538	40	128	1098	34	70

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	578	0	1912	558
Stage 1	-	-	-	-	558	-
Stage 2	-	-	-	-	1354	-
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	-	-	996	-	75	529
Stage 1	-	-	-	-	573	-
Stage 2	-	-	-	-	240	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	996	-	65	529
Mov Cap-2 Maneuver	-	-	-	-	162	-
Stage 1	-	-	-	-	573	-
Stage 2	-	-	-	-	209	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	22.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	304	-	-	996	-
HCM Lane V/C Ratio	0.34	-	-	0.129	-
HCM Control Delay (s)	22.8	-	-	9.1	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.5	-	-	0.4	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	9	6	6	28	45	28
Future Vol, veh/h	9	6	6	28	45	28
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	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	8	8	37	59	37

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	131	78	96	0	-	0
Stage 1	78	-	-	-	-	-
Stage 2	53	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	863	983	1498	-	-	-
Stage 1	945	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	859	983	1498	-	-	-
Mov Cap-2 Maneuver	859	-	-	-	-	-
Stage 1	945	-	-	-	-	-
Stage 2	965	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	1.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1498	-	905	-	-
HCM Lane V/C Ratio	0.005	-	0.022	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	5	0	0	34	22	14
Future Vol, veh/h	5	0	0	34	22	14
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	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	0	0	39	25	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	72	33	41	0	-	0
Stage 1	33	-	-	-	-	-
Stage 2	39	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	932	1041	1568	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	983	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	932	1041	1568	-	-	-
Mov Cap-2 Maneuver	932	-	-	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	983	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1568	-	932	-	-
HCM Lane V/C Ratio	-	-	0.006	-	-
HCM Control Delay (s)	0	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	6	5	73	0	8	5	145	198	0	3	146	8
Future Vol, veh/h	6	5	73	0	8	5	145	198	0	3	146	8
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	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	6	88	0	10	6	175	239	0	4	176	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	784	776	181	823	781	239	186	0	0	239	0	0
Stage 1	188	188	-	588	588	-	-	-	-	-	-	-
Stage 2	596	588	-	235	193	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	311	328	862	292	326	800	1388	-	-	1328	-	-
Stage 1	814	745	-	495	496	-	-	-	-	-	-	-
Stage 2	490	496	-	768	741	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	267	280	862	229	278	800	1388	-	-	1328	-	-
Mov Cap-2 Maneuver	267	280	-	229	278	-	-	-	-	-	-	-
Stage 1	696	743	-	423	424	-	-	-	-	-	-	-
Stage 2	406	424	-	682	739	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.3	15.1	3.4	0.1
HCM LOS	B	C		

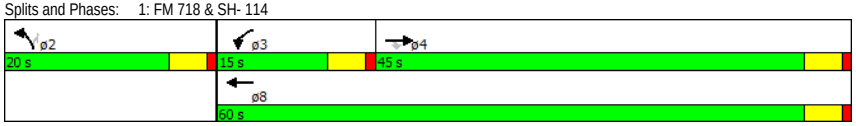
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1388	-	-	672	371	1328	-	-
HCM Lane V/C Ratio	0.126	-	-	0.151	0.042	0.003	-	-
HCM Control Delay (s)	8	0	-	11.3	15.1	7.7	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.5	0.1	0	-	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	668	19	93	380	44	335
Future Volume (vph)	668	19	93	380	44	335
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	742	21	103	422	49	372
Shared Lane Traffic (%)						
Lane Group Flow (vph)	742	21	103	422	49	372
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	20.0	20.0
Total Split (s)	45.0	45.0	15.0	60.0	20.0	20.0
Total Split (%)	56.3%	56.3%	18.8%	75.0%	25.0%	25.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Max	Max	None	Max	None	None
Act Effct Green (s)	44.5	44.5	8.9	55.6	8.9	8.9
Actuated g/C Ratio	0.60	0.60	0.12	0.76	0.12	0.12
v/c Ratio	0.66	0.02	0.48	0.30	0.23	0.74
Control Delay	15.8	4.3	38.8	4.0	31.1	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.8	4.3	38.8	4.0	31.1	14.5
LOS	B	A	D	A	C	B
Approach Delay	15.5			10.8	16.5	
Approach LOS	B			B	B	
Queue Length 50th (ft)	208	0	43	40	20	9
Queue Length 95th (ft)	441	11	96	109	49	85
Internal Link Dist (ft)	322			269	439	
Turn Bay Length (ft)		180	220			200
Base Capacity (vph)	1126	965	253	1408	373	610
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.02	0.41	0.30	0.13	0.61

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 73.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 14.3	Intersection LOS: B

Intersection Capacity Utilization 63.4% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: FM 718 & SH- 114



Intersection	
Int Delay, s/veh	4.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	992	20	45	457	20	143
Future Vol, veh/h	992	20	45	457	20	143
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	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1055	21	48	486	21	152

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1077	0	1648	1066
Stage 1	-	-	-	-	1066	-
Stage 2	-	-	-	-	582	-
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	-	-	647	-	109	270
Stage 1	-	-	-	-	331	-
Stage 2	-	-	-	-	559	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	647	-	101	270
Mov Cap-2 Maneuver	-	-	-	-	228	-
Stage 1	-	-	-	-	331	-
Stage 2	-	-	-	-	518	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	41.4
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	264	-	-	647	-
HCM Lane V/C Ratio	0.657	-	-	0.074	-
HCM Control Delay (s)	41.4	-	-	11	-
HCM Lane LOS	E	-	-	B	-
HCM 95th %tile Q(veh)	4.2	-	-	0.2	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	31	6	0	41	17	9
Future Vol, veh/h	31	6	0	41	17	9
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	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	8	0	58	24	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	88	30	37	0	-	0
Stage 1	30	-	-	-	-	-
Stage 2	58	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	913	1044	1574	-	-	-
Stage 1	993	-	-	-	-	-
Stage 2	965	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	913	1044	1574	-	-	-
Mov Cap-2 Maneuver	913	-	-	-	-	-
Stage 1	993	-	-	-	-	-
Stage 2	965	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1574	-	932	-	-
HCM Lane V/C Ratio	-	-	0.056	-	-
HCM Control Delay (s)	0	-	9.1	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	25	0	4	5	0	12
Future Vol, veh/h	25	0	4	5	0	12
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	0	4	5	0	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	27	0	41	27
Stage 1	-	-	-	-	27	-
Stage 2	-	-	-	-	14	-
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	-	-	1587	-	970	1048
Stage 1	-	-	-	-	996	-
Stage 2	-	-	-	-	1009	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1587	-	967	1048
Mov Cap-2 Maneuver	-	-	-	-	967	-
Stage 1	-	-	-	-	996	-
Stage 2	-	-	-	-	1006	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.2	8.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1048	-	-	1587	-
HCM Lane V/C Ratio	0.012	-	-	0.003	-
HCM Control Delay (s)	8.5	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	24	24	8	17	28	8
Future Vol, veh/h	24	24	8	17	28	8
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	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	26	9	18	30	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	71	35	39	0	-	0
Stage 1	35	-	-	-	-	-
Stage 2	36	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	933	1038	1571	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	986	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	927	1038	1571	-	-	-
Mov Cap-2 Maneuver	927	-	-	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	980	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	2.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1571	-	979	-	-
HCM Lane V/C Ratio	0.006	-	0.053	-	-
HCM Control Delay (s)	7.3	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	14	12	6	11	44	2
Future Vol, veh/h	14	12	6	11	44	2
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	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	13	7	12	49	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	77	51	52	0	-	0
Stage 1	51	-	-	-	-	-
Stage 2	26	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	926	1017	1554	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	997	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	921	1017	1554	-	-	-
Mov Cap-2 Maneuver	921	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	992	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	2.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1554	-	963	-	-
HCM Lane V/C Ratio	0.004	-	0.03	-	-
HCM Control Delay (s)	7.3	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	8	16	6	4	12	24
Future Vol, veh/h	8	16	6	4	12	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	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	17	7	4	13	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	11	0	-	0	44	9
Stage 1	-	-	-	-	9	-
Stage 2	-	-	-	-	35	-
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	1608	-	-	-	967	1073
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	987	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1608	-	-	-	961	1073
Mov Cap-2 Maneuver	-	-	-	-	961	-
Stage 1	-	-	-	-	1014	-
Stage 2	-	-	-	-	981	-

Approach	EB	WB	SB
HCM Control Delay, s	2.4	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1608	-	-	-	1033
HCM Lane V/C Ratio	0.005	-	-	-	0.038
HCM Control Delay (s)	7.3	0	-	-	8.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	8	9	134	12	2	17	36	148	4	10	278	3
Future Vol, veh/h	8	9	134	12	2	17	36	148	4	10	278	3
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	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	10	156	14	2	20	42	172	5	12	323	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	617	608	325	689	608	174	327	0	0	177	0	0
Stage 1	348	348	-	258	258	-	-	-	-	-	-	-
Stage 2	269	260	-	431	350	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	402	410	716	360	410	869	1233	-	-	1399	-	-
Stage 1	668	634	-	747	694	-	-	-	-	-	-	-
Stage 2	737	693	-	603	633	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	377	390	716	266	390	869	1233	-	-	1399	-	-
Mov Cap-2 Maneuver	377	390	-	266	390	-	-	-	-	-	-	-
Stage 1	643	628	-	719	668	-	-	-	-	-	-	-
Stage 2	690	667	-	459	627	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.5	13.8	1.5	0.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1233	-	-	652	444	1399	-	-
HCM Lane V/C Ratio	0.034	-	-	0.269	0.081	0.008	-	-
HCM Control Delay (s)	8	0	-	12.5	13.8	7.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	0.3	0	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	84	60	144	28	20	208
Future Vol, veh/h	84	60	144	28	20	208
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	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	91	65	157	30	22	226

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	442	172	0	0	187	0
Stage 1	172	-	-	-	-	-
Stage 2	270	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	573	872	-	-	1387	-
Stage 1	858	-	-	-	-	-
Stage 2	775	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	563	872	-	-	1387	-
Mov Cap-2 Maneuver	563	-	-	-	-	-
Stage 1	858	-	-	-	-	-
Stage 2	761	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.1	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	661	1387	-
HCM Lane V/C Ratio	-	-	0.237	0.016	-
HCM Control Delay (s)	-	-	12.1	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.9	0	-

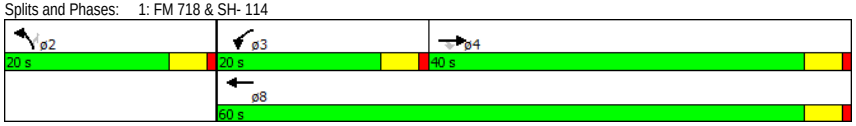
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	446	70	297	763	55	130
Future Volume (vph)	446	70	297	763	55	130
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	480	75	319	820	59	140
Shared Lane Traffic (%)						
Lane Group Flow (vph)	480	75	319	820	59	140
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Detector Phase	4	4	3	8	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	9.5	22.5	20.0	20.0
Total Split (s)	40.0	40.0	20.0	60.0	20.0	20.0
Total Split (%)	50.0%	50.0%	25.0%	75.0%	25.0%	25.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	Max	Max	None	Max	None	None
Act Effct Green (s)	36.1	36.1	15.3	56.9	7.8	7.8
Actuated g/C Ratio	0.51	0.51	0.22	0.81	0.11	0.11
v/c Ratio	0.50	0.09	0.83	0.54	0.30	0.47
Control Delay	14.8	3.3	48.5	5.2	33.7	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.8	3.3	48.5	5.2	33.7	11.6
LOS	B	A	D	A	C	B
Approach Delay	13.3			17.3	18.1	
Approach LOS	B			B	B	
Stops (vph)	287	10	250	266	48	25
Fuel Used(gal)	8	0	12	18	1	1
CO Emissions (g/hr)	546	29	871	1278	60	68
NOx Emissions (g/hr)	106	6	169	249	12	13
VOC Emissions (g/hr)	127	7	202	296	14	16
Dilemma Vehicles (#)	31	0	0	45	0	0
Queue Length 50th (ft)	138	0	137	110	25	0
Queue Length 95th (ft)	237	20	#284	217	58	47
Internal Link Dist (ft)	322			269	439	
Turn Bay Length (ft)		180	220			200

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Base Capacity (vph)	954	847	392	1506	392	459
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.09	0.81	0.54	0.15	0.31

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 70.4
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 16.2 Intersection LOS: B
Intersection Capacity Utilization 55.3% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: FM 718 & SH- 114



Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	540	37	156	1085	31	86
Future Vol, veh/h	540	37	156	1085	31	86
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	587	40	170	1179	34	93

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	627	0	2125	607
Stage 1	-	-	-	-	607	-
Stage 2	-	-	-	-	1518	-
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	-	-	955	-	55	496
Stage 1	-	-	-	-	544	-
Stage 2	-	-	-	-	200	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	955	-	45	496
Mov Cap-2 Maneuver	-	-	-	-	129	-
Stage 1	-	-	-	-	544	-
Stage 2	-	-	-	-	164	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	27.7
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	283	-	-	955	-
HCM Lane V/C Ratio	0.449	-	-	0.178	-
HCM Control Delay (s)	27.7	-	-	9.6	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	2.2	-	-	0.6	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	17	6	6	43	70	41
Future Vol, veh/h	17	6	6	43	70	41
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	76	76	76	76	76	76
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	8	8	57	92	54

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	191	119	146	0	-	0
Stage 1	119	-	-	-	-	-
Stage 2	72	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	798	933	1436	-	-	-
Stage 1	906	-	-	-	-	-
Stage 2	951	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	793	933	1436	-	-	-
Mov Cap-2 Maneuver	793	-	-	-	-	-
Stage 1	906	-	-	-	-	-
Stage 2	945	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1436	-	825	-	-
HCM Lane V/C Ratio	0.005	-	0.037	-	-
HCM Control Delay (s)	7.5	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	16	0	13	34	0	7
Future Vol, veh/h	16	0	13	34	0	7
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	0	14	37	0	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	17	0	82	17
Stage 1	-	-	-	-	17	-
Stage 2	-	-	-	-	65	-
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	-	-	1600	-	920	1062
Stage 1	-	-	-	-	1006	-
Stage 2	-	-	-	-	958	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1600	-	912	1062
Mov Cap-2 Maneuver	-	-	-	-	912	-
Stage 1	-	-	-	-	1006	-
Stage 2	-	-	-	-	949	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	8.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1062	-	-	1600	-
HCM Lane V/C Ratio	0.007	-	-	0.009	-
HCM Control Delay (s)	8.4	-	-	7.3	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	15	15	25	39	51	25
Future Vol, veh/h	15	15	25	39	51	25
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	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	16	27	42	55	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	166	69	83	0	-	0
Stage 1	69	-	-	-	-	-
Stage 2	97	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	824	994	1514	-	-	-
Stage 1	954	-	-	-	-	-
Stage 2	927	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	809	994	1514	-	-	-
Mov Cap-2 Maneuver	809	-	-	-	-	-
Stage 1	954	-	-	-	-	-
Stage 2	910	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	2.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1514	-	892	-	-
HCM Lane V/C Ratio	0.018	-	0.037	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	5	7	13	59	37	14
Future Vol, veh/h	5	7	13	59	37	14
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	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	8	15	67	42	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	147	50	58	0	-	0
Stage 1	50	-	-	-	-	-
Stage 2	97	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	845	1018	1546	-	-	-
Stage 1	972	-	-	-	-	-
Stage 2	927	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	837	1018	1546	-	-	-
Mov Cap-2 Maneuver	837	-	-	-	-	-
Stage 1	972	-	-	-	-	-
Stage 2	918	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	1.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1546	-	934	-	-
HCM Lane V/C Ratio	0.01	-	0.015	-	-
HCM Control Delay (s)	7.4	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	25	5	14	13	7	15
Future Vol, veh/h	25	5	14	13	7	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	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	5	15	14	8	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	29	0	-	0	82	22
Stage 1	-	-	-	-	22	-
Stage 2	-	-	-	-	60	-
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	1584	-	-	-	920	1055
Stage 1	-	-	-	-	1001	-
Stage 2	-	-	-	-	963	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1584	-	-	-	904	1055
Mov Cap-2 Maneuver	-	-	-	-	904	-
Stage 1	-	-	-	-	1001	-
Stage 2	-	-	-	-	947	-

Approach	EB	WB	SB
HCM Control Delay, s	6.1	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1584	-	-	-	1002
HCM Lane V/C Ratio	0.017	-	-	-	0.024
HCM Control Delay (s)	7.3	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	6	5	73	7	8	12	145	286	13	16	198	8
Future Vol, veh/h	6	5	73	7	8	12	145	286	13	16	198	8
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	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	6	88	8	10	14	175	345	16	19	239	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	996	992	243	1031	989	352	248	0	0	360	0	0
Stage 1	282	282	-	702	702	-	-	-	-	-	-	-
Stage 2	714	710	-	329	287	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	223	246	796	211	247	692	1318	-	-	1199	-	-
Stage 1	725	678	-	429	440	-	-	-	-	-	-	-
Stage 2	422	437	-	684	674	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	181	201	796	158	202	692	1318	-	-	1199	-	-
Mov Cap-2 Maneuver	181	201	-	158	202	-	-	-	-	-	-	-
Stage 1	605	666	-	358	367	-	-	-	-	-	-	-
Stage 2	336	364	-	592	662	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.8	20.3	2.7	0.6
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1318	-	-	561	267	1199	-	-
HCM Lane V/C Ratio	0.133	-	-	0.18	0.122	0.016	-	-
HCM Control Delay (s)	8.1	0	-	12.8	20.3	8.1	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.7	0.4	0	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	52	37	216	88	63	170
Future Vol, veh/h	52	37	216	88	63	170
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	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	40	235	96	68	185

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	605	283	0	0	330	0
Stage 1	283	-	-	-	-	-
Stage 2	322	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	461	756	-	-	1229	-
Stage 1	765	-	-	-	-	-
Stage 2	735	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	432	756	-	-	1229	-
Mov Cap-2 Maneuver	432	-	-	-	-	-
Stage 1	765	-	-	-	-	-
Stage 2	689	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.4	0	2.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	526	1229	-
HCM Lane V/C Ratio	-	-	0.184	0.056	-
HCM Control Delay (s)	-	-	13.4	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.2	-