

December 15, 2023

Job No. 4-423-0090

Ms. Tenea Davis  
**Manteca 18, LLC**  
1925 Village Center Circle, Suite 150  
Las Vegas, NV 89314

**Subject:**       **TRAFFIC IMPACT ANALYSIS**  
Proposed Commercial Development  
2064 North Union Road  
Manteca, California

Dear Ms. Davis:

At your request and authorization, a Traffic Memorandum to include the Trip Generation and VMT Screening for the above-referenced project located at 2064 North Union Road in the City of Manteca, California (subject property) was conducted by SALEM's Traffic subconsultant (see following report).

This traffic impact analysis (TIA) analyzes the projected traffic operations associated with the proposed project, Crossroads Plaza, to be located at 2064 North Union Road in the City of Manteca. The purpose of this TIA is to evaluate potential circulation system deficiencies that may result from the development of the proposed project, and to recommend improvements to achieve acceptable operations, if applicable. This analysis has been prepared in coordination with the City of Manteca via a scoping agreement and is pursuant to applicable City of Manteca traffic impact analysis guidelines. The proposed project development includes a twelve-pump gas station with a 5,200 square foot convenience store, and a 6,816 square-foot automobile supply store. Site access is planned via two right-in/right-out (RI/RO) driveways, the first on North Union Road and the second on West Lathrop Road. The site is currently zoned as CN for Neighborhood Commercial per the City of Manteca General Plan. The project site is currently vacant. The proposed project is anticipated to be built and generating trips in 2024.

Please refer to the following report for details resulting from this TIA. We appreciate the opportunity to assist you with this project. If you have any questions, or if we may be of further assistance, please do not hesitate to contact our office at (909) 980-6455.

Respectfully submitted,

**SALEM Engineering Group, Inc.**



Maria G. Ruvalcaba, EP  
Project Manager

# Crossroads Plaza Traffic Impact Analysis

*City of Manteca, California*

December 15, 2023

Prepared by:



TJW ENGINEERING, INC.  
9841 Irvine Center Drive, Suite 200  
Irvine, CA 92618  
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**TJW ENGINEERING, INC.**  
TRAFFIC ENGINEERING &  
TRANSPORTATION PLANNING  
CONSULTANTS

December 15, 2023

Ms. Maria Ruvalcaba  
*SALEM ENGINEERING, INC.*  
8711 Monroe Court, Suite A  
Rancho Cucamonga, CA 91730

**Subject: Traffic Impact Analysis – Crossroads Plaza, 2064 North Union Road, City of Manteca**

Dear Ms. Ruvalcaba:

*TJW ENGINEERING, INC.* (TJW) is pleased to present you with this traffic impact analysis for the proposed project, Crossroads Plaza, located at 2064 North Union Road in the City of Manteca. This traffic study has been prepared to meet the traffic study requirements for the City of Manteca and assess the forecast traffic operations associated with the proposed project and its impact on the local street network. This report is being submitted to you for review and forwarding to the City of Manteca.

Please contact us at (949) 878-3509 if you have any questions regarding this analysis.

Sincerely,

A handwritten signature in black ink, appearing to read 'Gene Kim', written over a circular professional seal.

Gene Kim, PE, TE  
Principal Engineer

A handwritten signature in black ink, appearing to read 'David Chew', written over a circular professional seal.

David Chew, PTP  
Transportation Planner

Registered Civil Engineer #83175  
Registered Traffic Engineer #2684



A handwritten signature in black ink, appearing to read 'Daniel Flores', written over a circular professional seal.

Daniel Flores, EIT  
Project Engineer

# Crossroads Plaza Traffic Impact Analysis

*City of Manteca, California*

December 15, 2023

Prepared for:

Ms. Maria G Ruvalcaba  
SALEM ENGINEERING, INC.  
8711 Monroe Court, Suite A  
Rancho Cucamonga, CA 91730

Prepared by:

Gene Kim, PE, TE  
David Chew, PTP  
Daniel Flores, EIT



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## 1.0 EXECUTIVE SUMMARY

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This traffic impact analysis (TIA) analyzes the projected traffic operations associated with the proposed project, Crossroads Plaza, located at 2064 North Union Road in the City of Manteca. The purpose of this TIA is to evaluate potential circulation system deficiencies that may result from the development of the proposed project, and to recommend improvements to achieve acceptable operations, if applicable. This analysis has been prepared in coordination with the City of Manteca via a scoping agreement (See **Appendix A**) and is pursuant to applicable City of Manteca traffic impact analysis guidelines.

The proposed project consists of a 12-pump gas station with a 5,200 square foot convenience store and a 6,816 square foot auto supply store. Site access is planned via two right-in/right-out (RI/RO) driveways, the first on North Union Road and the second on West Lathrop Road. The site is currently zoned as CN for Neighborhood Commercial per the City of Manteca General Plan. The project site is currently vacant. The proposed project is anticipated to be built and generating trips in 2024.

The proposed project is projected to generate 984 daily trips, 95 AM peak hour trips, and 87 PM peak hour trips.

The following four (4) intersections and two (2) roadway segments in the vicinity of the project site have been included in the level of service (LOS) analysis:

### Intersections:

1. North Union Road/West Lathrop Road.
2. Arrowsmith Drive/West Lathrop Road.
3. Project Driveway #1/West Lathrop Road, and
4. North Union Road/Project Driveway #2.

### Roadway Segments:

1. North Union Road south of West Lathrop Road; and
2. West Lathrop Road east of North Union Road.

The study intersections are analyzed for the following study scenarios:

- Existing Traffic Conditions (Existing);
- Opening Year Traffic Plus Projects Conditions (Opening Year with Cumulative Projects + Proposed Project).
- Cumulative Traffic Conditions (Horizon Year 2040 with Cumulative Projects); and



- Cumulative Traffic Plus Project Conditions (Horizon Year 2040 with Cumulative Projects + Proposed Project).

### 1.1 SUMMARY OF LEVEL OF SERVICE ANALYSIS RESULTS

**Table ES-1** summarizes the results of the intersection level of service analysis based on the City of Manteca thresholds of significance for analyzing transportation deficiencies.

**Table ES-1**  
Summary of Transportation Deficiencies at Study Intersections

Intersection		Existing	Opening Year	Cumulative No Project	Cumulative With Project
1	North Union Road / West Lathrop Road	No Deficiencies	No Deficiencies	No Deficiencies	No Deficiencies
2	Arrowsmith Drive / West Lathrop Road	No Deficiencies	No Deficiencies	No Deficiencies	No Deficiencies
3	West Lathrop Road / Project Driveway #1	No Deficiencies	No Deficiencies	No Deficiencies	No Deficiencies
4	North Union Road / Project Driveway #2	No Deficiencies	No Deficiencies	No Deficiencies	No Deficiencies

#### Existing Conditions

The study intersections are projected to operate at an acceptable LOS during the AM and PM peak hours for *Existing* conditions.

#### Opening Year Traffic Plus Project Conditions

The study intersections are projected to operate at an acceptable LOS during the AM and PM peak hours for *Opening Year Traffic Plus Project* conditions.

#### Cumulative Traffic Conditions

The study intersections are projected to operate at an acceptable LOS during the AM and PM peak hours for *Cumulative Traffic* conditions.

#### Cumulative Traffic Plus Project Conditions

The study intersections are projected to operate at an acceptable LOS during the AM and PM peak hours for *Cumulative Traffic Plus Project* conditions.



## 1.2 ON-SITE ROADWAY AND SITE ACCESS IMPROVEMENTS

Wherever necessary, roadways adjacent to the proposed project site and site access points will be constructed in compliance with recommended roadway classifications and respective cross-sections in the City of Manteca General Plan or as directed by the City Engineer.

Sight distance at each project access point should be reviewed with respect to standard Caltrans and City sight distance standards at the time of final grading, landscaping, and street improvement plans.

Signing/stripping should be implemented in conjunction with detailed construction plans for the project site.



## 2.0 INTRODUCTION

---

This traffic impact analysis (TIA) analyzes the projected traffic operations associated with the proposed project, Crossroads Plaza, located at 2064 North Union Road in the City of Manteca. The purpose of this TIA is to evaluate potential circulation system deficiencies that may result from the development of the proposed project, and to recommend improvements to achieve acceptable operations, if applicable. This analysis has been prepared in coordination with the City of Manteca via a scoping agreement (See **Appendix A**) and is pursuant to applicable City of Manteca traffic impact analysis guidelines.

### 2.1 PROJECT DESCRIPTION

The proposed project consists of a 5,200 square foot convenience store and a 6,816 square foot auto supply store. Site access is planned via two right-in/right-out (RI/RO) driveways, the first on North Union Road and the second on West Lathrop Road. The site is currently zoned as CN for Neighborhood Commercial per the City of Manteca General Plan. The project site is currently vacant. The proposed project is anticipated to be built and generating trips in 2025.

**Exhibit 1** shows the project site location. **Exhibit 2** shows the proposed project site plan.

### 2.2 STUDY AREA

The following four (4) intersections and two (2) roadway segments in the vicinity of the project site have been included in the level of service (LOS) analysis:

Intersections:

1. North Union Road/West Lathrop Road
2. Arrowsmith Drive/West Lathrop Road
3. West Lathrop Road/Project Driveway #1
4. North Union Road/Project Driveway #2

Roadway Segments:

1. North Union Road south of West Lathrop Road
2. West Lathrop Road east of North Union Road

The study intersections and roadway segments are all located within the City of Manteca. This traffic analysis follows the *City of Manteca Transportation Impact Analysis Guidelines*.

**Exhibit 1** shows the location of the study intersections and roadway segments which are analyzed for the following study scenarios:



- Existing Traffic Conditions (Existing);
- Opening Year Traffic Plus Projects Conditions (Opening Year with Cumulative Projects + Proposed Project);
- Cumulative Traffic Conditions (Horizon Year 2040 with Cumulative Projects); and
- Cumulative Traffic Plus Project Conditions (Horizon Year 2040 with Cumulative Projects + Proposed Project).

Traffic operations are evaluated for the following time periods:

- Weekday AM Peak Hour occurring between 7:00 AM to 9:00 AM; and
- Weekday PM Peak Hour occurring between 4:00 PM to 6:00 PM.

## 2.3 ANALYSIS METHODOLOGY

### 2.3.1 Intersection Analysis Methodology

The traffic analysis focuses on the project's off-site traffic-related impacts at the traffic study area intersections and on the study area roadway segments. In accordance with the City of Manteca Transportation Impact Study Guidelines, intersection operation for both signalized and unsignalized intersections is evaluated using the methodology of the Highway Capacity Manual (HCM) 7<sup>th</sup> Edition (Transportation Research Board, 2022).

The Highway Capacity Manual uses Level of Service (LOS) to describe the quality of flow on roadways and at intersections using a range from LOS A, or very favorable progression, to LOS F, or very poor progression. The LOS definitions for interruption of traffic flow differ depending on the type of traffic control (traffic signal, unsignalized intersection with side street stops, unsignalized intersection with all-way stops).

The Highway Capacity Manual LOS ranges for signalized intersections is based on the intersection's average control delay for all movements at the intersection during the peak hour. Control delays include initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

**Table 1** identifies each Level of Service category with the corresponding general characteristics of traffic flow plus accompanying delay ranges at signalized intersections.

**Table 1**  
**HCM – LOS & Delay Thresholds – Signalized Intersections**

Level of Service	Description	Delay (in seconds)
A	Very favorable progression: most vehicles arrive during green signal and do not stop. Short cycle lengths.	0 – 10.00
B	Good progression, short cycle lengths. More vehicles stop than for LOS A.	10.01 – 20.00
C	Fair progression; longer cycle lengths. Individual cycle failures may begin to appear. The number of vehicles stopping is significant, though many vehicles still pass through without stopping.	20.01 – 35.00
D	Progression less favorable, longer cycle length and high flow/capacity ratio. The proportion of vehicles that pass through without stopping diminishes. Individual cycle failures are obvious.	35.01 – 55.00
E	Severe congestion with some long-standing queues on critical approaches. Poor progression, long cycle lengths and high flow/capacity ratio. Individual cycle failures are frequent.	55.01 – 80.00
F	Very poor progression, long cycle lengths and many individual cycle failures. Arrival flow rates exceed capacity of intersection.	> 80.01

Source: Transportation Research Board, *Highway Capacity Manual*, HCM 7th Edition (Washington D.C., 2022).

The Highway Capacity Manual LOS range for unsignalized intersections is based on the weighted average control delay expressed in seconds per vehicle. At a two-way or side-street stop-controlled intersection, LOS is calculated for each stop-controlled minor street movement, for the left-turn movement(s) from the major street, and for the intersection as a whole. For approaches consisting of a single lane, the delay is calculated as the average of all movements in that lane. For all-way stop-controlled intersections, LOS is computed for the intersection as a whole. **Table 2** describes the general characteristics of traffic flow and accompanying delay ranges at unsignalized intersections.

**Table 2**  
**HCM – LOS & Delay Thresholds – Unsignalized Intersections**

Level of Service	Description	Delay (in seconds)
A	Little or no delays.	0 – 10.00
B	Short traffic delays.	10.01 – 15.00
C	Average traffic delays.	15.01 – 25.00
D	Long traffic delays. Multiple vehicles in queue.	25.01 – 35.00
E	Very long delays. Demand approaching capacity of intersection	35.01 – 50.00
F	Very constrained flow with extreme delays and intersection capacity exceeded.	> 50.01

Source: Transportation Research Board, *Highway Capacity Manual*, HCM 7th Edition (Washington D.C., 2022).

This study utilizes *PTV Vistro 2022* analysis software for all signalized and unsignalized intersections. Vistro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis specified in Chapter 16 of the HCM. The level of service and capacity analysis performed within Vistro takes into consideration the optimization and coordination of signalized and unsignalized intersections within a network.



### 2.3.2 Roadway Segment Analysis Methodology

The City of Manteca Transportation Impact Analysis Guidelines utilizes the Highway Capacity Manual to evaluate roadway segment daily capacity and corresponding LOS for each roadway classification. LOS is estimated by comparing the two-way 24-hour traffic volumes on the roadway segment to the daily roadway capacity, based on its functional classification. This comparison results in a volume-to-capacity (v/c) ratio, which represents the percentage of the daily vehicular capacity that is required to accommodate the daily traffic volume. **Table 3** presents the LOS range based on daily roadway segment capacity.

**Table 3**  
HCM – LOS & Capacity Thresholds – Roadway Segments

Number of Lanes	Maximum Daily Two-Way Traffic Volume (ADT <sup>1</sup> )				
	LOS A	LOS B	LOS C	LOS D	LOS E
2	8,400	9,300	11,800	14,700	17,300
4	18,600	20,600	26,000	32,500	38,200
6	28,800	32,000	40,300	50,400	59,300
8	38,100	42,300	53,300	66,600	78,400

Source: City of Manteca Transportation Impact Analysis Guidelines

1: ADT = Average Daily Traffic

## 2.4 PERFORMANCE CRITERIA

### 2.4.1 City of Manteca

The City of Manteca General Plan has established the level of service “D” or better as acceptable LOS for all intersections and roadways within the designated street and highway system in the General Plan Circulation Element. For the purposes of analyzing the proposed project’s impact on traffic conditions, the City of Manteca Transportation Impact Study Guidelines identify significant impacts through a comparison of “no project” and “with project” traffic conditions.

For signalized and unsignalized intersections, impact is established if the project causes the LOS to change from an acceptable LOS under “no project” conditions to an unacceptable LOS under “with project” conditions. In addition, should the intersection under existing “no project” conditions operate at an unacceptable LOS, the project has an impact if the average vehicle delay increases by five (5) seconds or more.

For roadway segments, impact is established if the project causes the LOS to change from an acceptable LOS under “no project” conditions to an unacceptable LOS under “with project” conditions. Additionally, the project is determined to have an impact should it increase the daily volume-to-capacity ratio (v/c) by more than 0.1.





**Legend:**



Project Site



Study Intersection Location



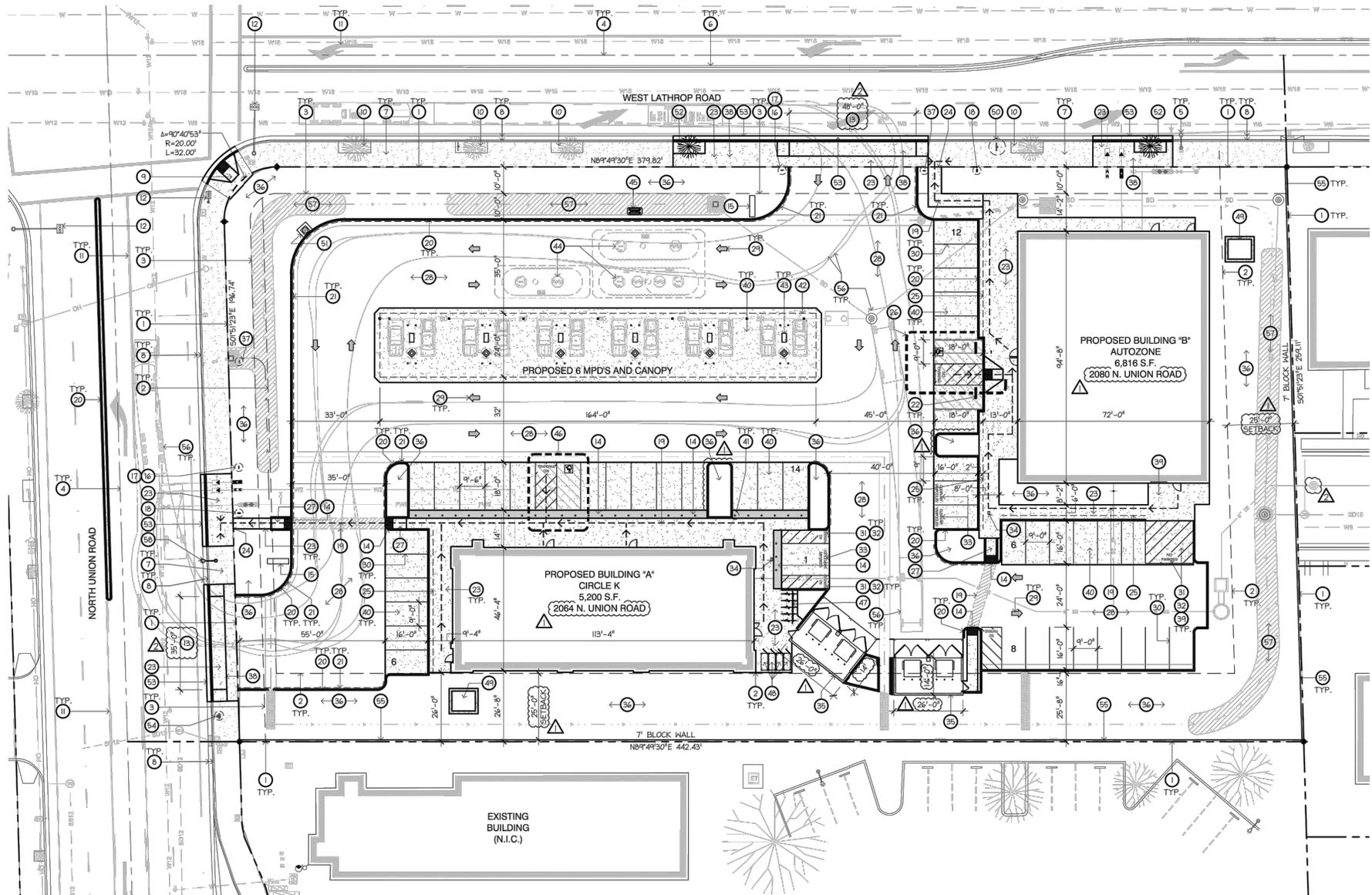
**Exhibit 1: Proposed Project Location**

Crossroads Plaza Trip Gen

SEG-23-002



Not to Scale



### 3.0 EXISTING CONDITIONS

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#### 3.1 EXISTING CIRCULATION NETWORK/STUDY AREA CONDITIONS

The characteristics of the roadway system within the vicinity of the project site are described in **Table 4**.

**Table 4**  
Roadway Characteristics within Study Area

Roadway	Classification <sup>1</sup>	Jurisdiction	Direction	Existing Travel Lanes	Median Type <sup>2</sup>	Speed Limit (mph)	On-Street Parking
North Union Road	Arterial	Manteca	North-South	4	NM	40	No
West Lathrop Road	Arterial	Manteca	East-West	4	RM	45	No

1: Source: City of Manteca General Plan (April 2023)

2: TWLTL = Two-Way Left-Turn Lane, RM= Raised Median, NM = No Median.

**Exhibit 3** shows the existing conditions of the study area intersection controls and roadway geometry.

#### 3.2 CITY OF MANTECA GENERAL PLAN CIRCULATION ELEMENT

The proposed project site is located within the City of Manteca. **Appendix A** contains the current *City of Manteca General Plan Circulation Element* and an explanation of roadway cross sections.

#### 3.3 EXISTING BICYCLE AND PEDESTRIAN FACILITIES

Within the study area, a Class II bike lane exists on North Union Road south of West Lathrop Road.

#### 3.4 EXISTING PUBLIC TRANSIT SERVICES

The City of Manteca is served by the Manteca Transit which provides bus service throughout the City of Manteca. Manteca Transit Route 3 has a stop on North Union Road 95 feet from the south border of the proposed project. **Appendix A** shows the routes in the vicinity of the project site.

#### 3.5 EXISTING TRAFFIC VOLUMES

To determine the existing operation of the study intersections, AM and PM peak period traffic volumes were estimated based on new traffic counts collected on November 14, 2023. Detailed traffic count data is provided in **Appendix B**. **Exhibit 4** shows existing AM and PM peak hour volumes at the study intersections.

### 3.6 EXISTING CONDITIONS INTERSECTION LEVEL OF SERVICE ANALYSIS

Existing conditions AM and PM peak hour intersection analysis is shown in **Table 5**. Calculations are based on the existing geometrics at the study area intersections as shown in **Exhibit 3**. HCM analysis sheets are provided in **Appendix C**.

**Table 5**  
Intersection Analysis – Existing Conditions

Intersection			Control Type	Peak Hour	Existing Conditions	
					Delay (s/veh)	LOS
1	North Union Road	West Lathrop Road	Signal	AM	32.00	C
				PM	33.20	C
2	Arrowsmith Drive	West Lathrop Road	TWSC	AM	17.32	C
				PM	14.48	B

Note: TWSC = Two-Way Stop-Control; Delay shown in seconds per vehicle.

1 = Per the Highway Capacity Manual 7th Edition, for signalized intersection, the overall average delay and LOS are shown. For intersections with one or two-way stop-control, the delay and LOS for the worst individual movement is shown.

As shown, the study intersections are currently operating at an acceptable LOS during the AM and PM peak hours.

### 3.7 EXISTING CONDITIONS ROADWAY SEGMENT LEVEL OF SERVICE ANALYSIS

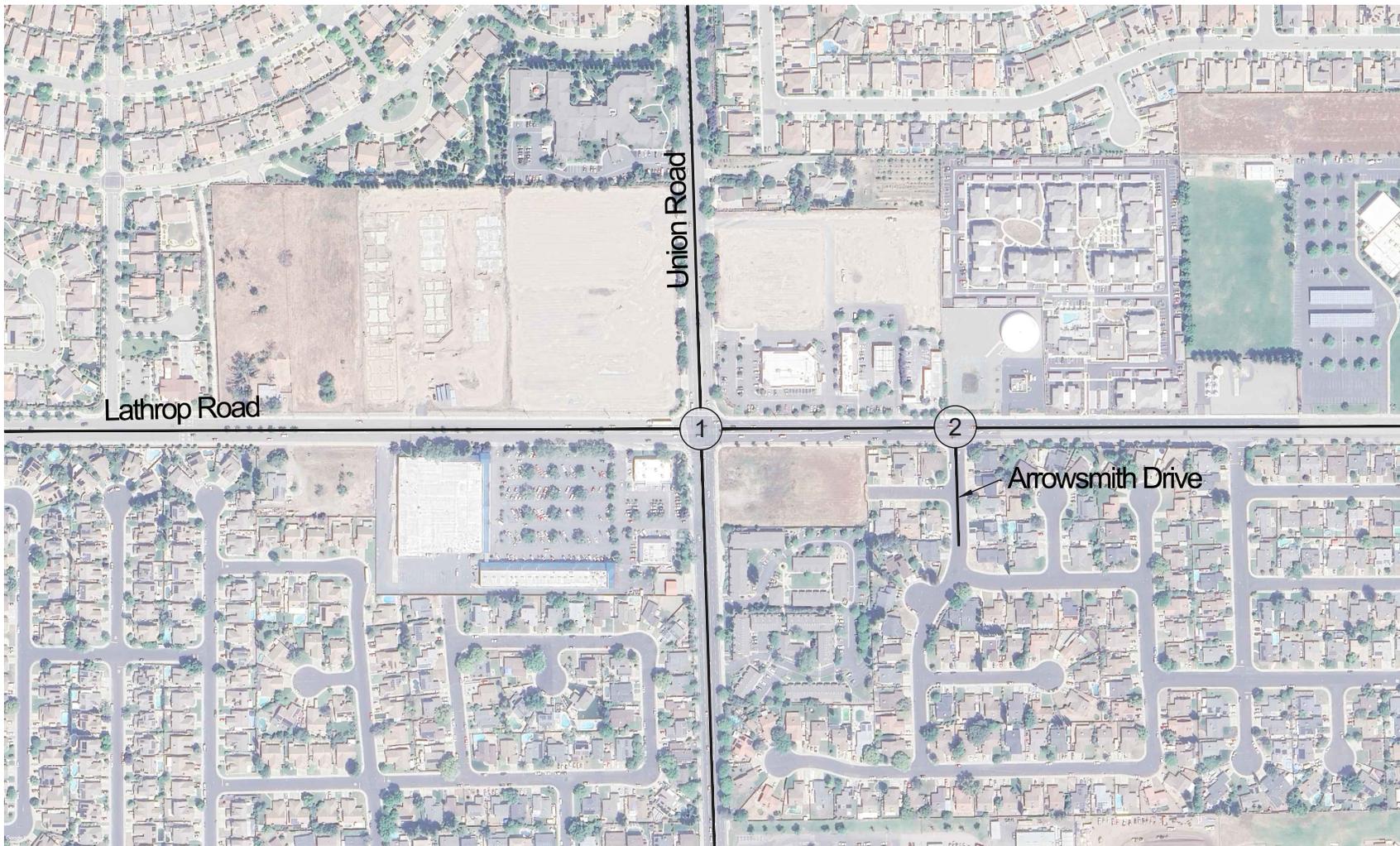
The roadway segment level of service analysis was conducted based on the roadway capacities presented previously in this report. The results of the roadway analysis for Existing Conditions are shown in **Table 6**. Review of this table indicates that the study roadway segments are currently operating at an acceptable level of service on a daily basis.

**Table 6**  
Roadway Segment – Existing Conditions

Roadway	Segment	Classification	Existing Travel Lanes	LOS D Capacity	Existing ADT <sup>1</sup>	V/C	LOS
North Union Road	West Lathrop Road to Sprague Street	Arterial	4	32,500	11,530	0.302	A
West Lathrop Road	North Union Road to Arrowsmith Drive	Arterial	4	32,500	17,180	0.450	A

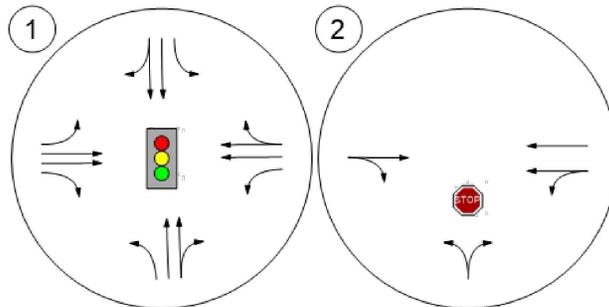
1: ADT = Average Daily Traffic based on 10% of peak hour volumes.

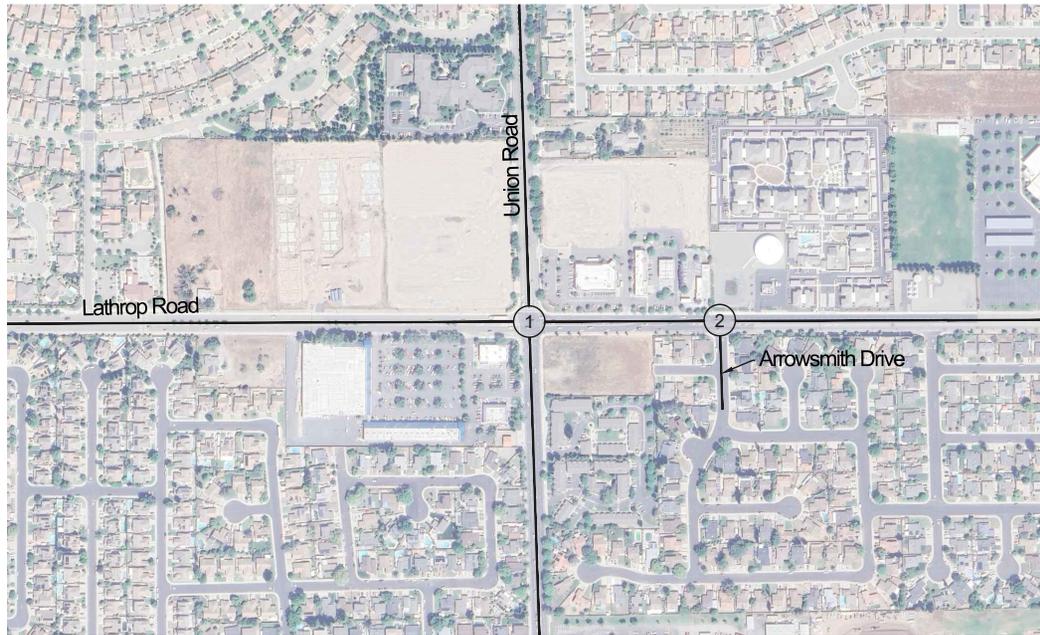




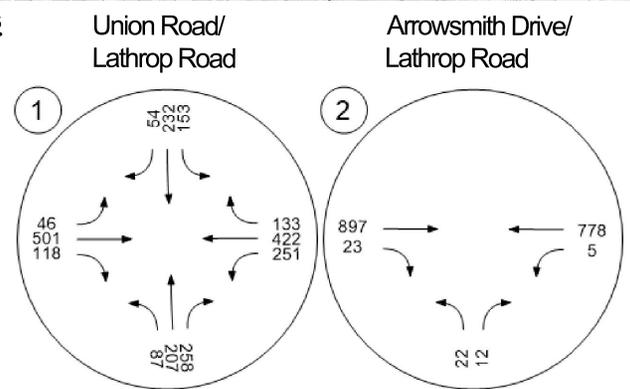
Union Road/  
Lathrop Road

Arrowsmith Drive/  
Lathrop Road

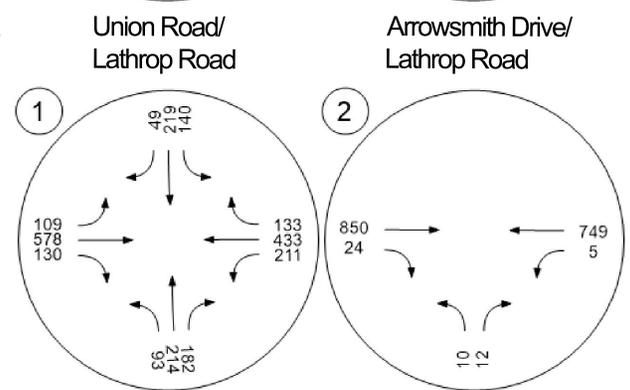




AM Peak Hour Volumes



PM Peak Hour Volumes



## 4.0 PROPOSED PROJECT

### 4.1 PROJECT DESCRIPTION

The proposed project consists of a 5,200 square foot convenience store and a 6,816 square foot auto supply store. Site access is planned via two right-in/right-out (RI/RO) driveways, the first on North Union Road and the second on West Lathrop Road. The site is currently zoned as CN for Neighborhood Commercial per the City of Manteca General Plan. The project site is currently vacant. The proposed project is anticipated to be built and generating trips in 2025.

**Exhibit 2** as previously shown displays the proposed project site plan.

### 4.2 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic, both inbound and outbound, produced by a development. Determining trip generation for a proposed project is based on projecting the amount of traffic that the specific land uses being proposed will produce. Industry standard *Institute of Transportation Engineers (ITE) Trip Generation Manual (11th Edition, 2021)* trip generation rates were used to determine trip generation of for most of the proposed project land uses.

**Table 7** summarizes the projected AM peak hour, PM peak hour, and daily trip generation of the proposed project. The proposed project is projected to generate 984 net daily trips with 95 net AM and 87 net PM peak hour trips.

**Table 7**  
Proposed Project Trip Generation

Proposed Land Use <sup>1</sup>	ITE Code	Qty	Unit <sup>2</sup>	Daily		AM Peak Hour					PM Peak Hour				
				Rate	Volume	Rate	In:Out Split	Volume			Rate	In:Out Split	Volume		
								In	Out	Total			In	Out	Total
Convenience Store/Gas Station, GFA (4-5.5k), VFP (>8) <i>Pass-By Trips (0.75 Daily, 0.76 AM, 0.75 PM)</i>	945	12.00	VFP	257.13	3,086	27.04	50:50	162	162	324	22.76	50:50	137	136	273
					-2,315			-123	-123	-246			-103	-102	-205
Automobile Parts Sales <i>Pass-By Trips (0.43 Daily, 0.43 PM)</i>	843	6.82	TSF	54.57	372	2.51	55:45	9	8	17	4.9	48:52	16	17	33
					-160			0	0	0			-7	-7	-14
<b>Results</b>				<b>Daily</b>	<b>Volume</b>	<b>AM Peak Hour</b>		<b>In</b>	<b>Out</b>	<b>Total</b>	<b>PM Peak Hour</b>		<b>In</b>	<b>Out</b>	<b>Total</b>
Subtotal					3,458			171	170	341			153	153	306
Pass-By Trips					-2,474			-123	-123	-246			-110	-109	-219
<b>Net Total</b>					<b>984</b>			<b>48</b>	<b>47</b>	<b>95</b>			<b>43</b>	<b>44</b>	<b>87</b>

1: Trip generation and pass-by rates from ITE Trip Generation (11th Edition, 2021).

2: TSF = Thousand Square Feet; VFP = Vehicle Fueling Positions.

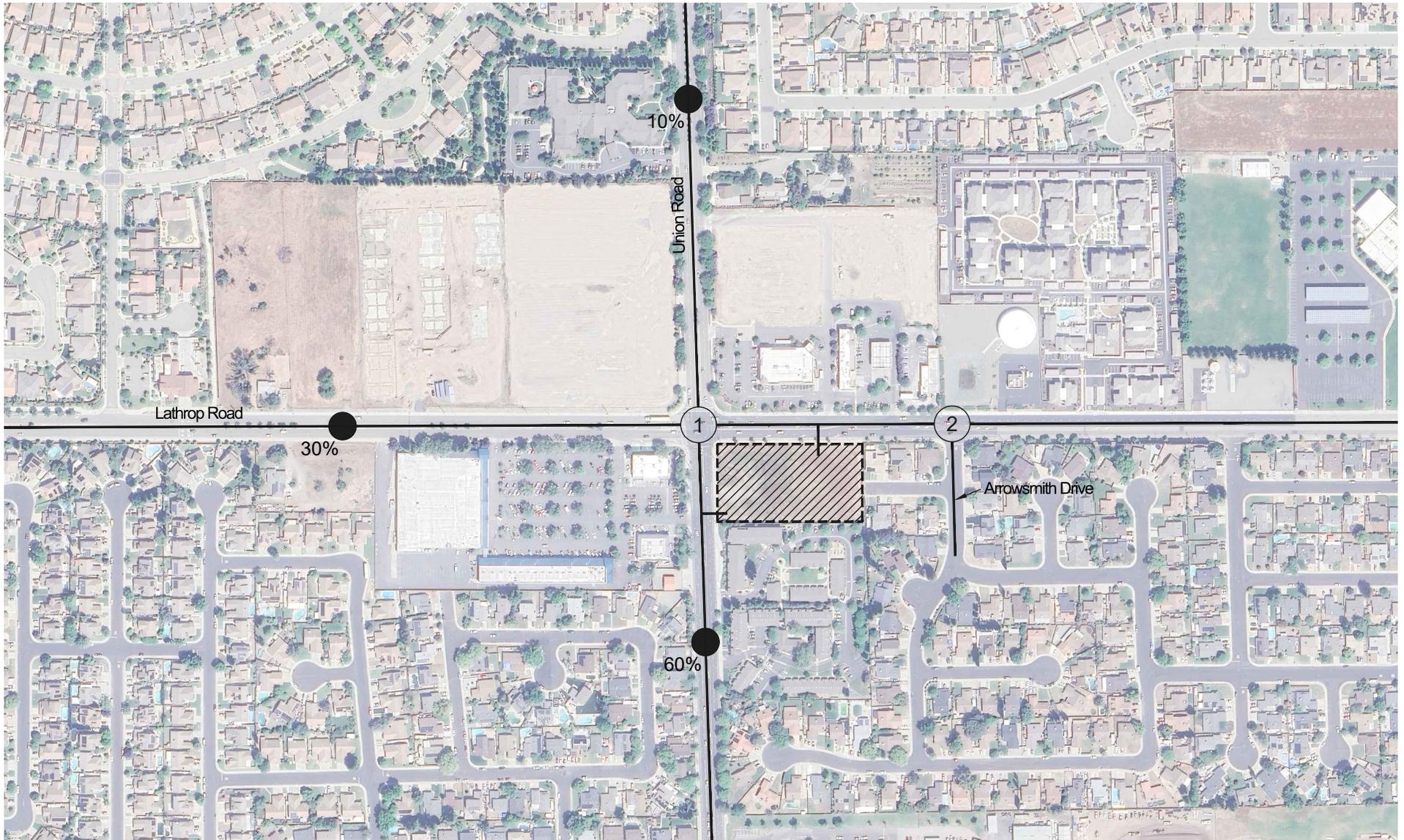


### 4.3 PROJECT TRIP DISTRIBUTION

Projecting trip distribution involves identifying probable destinations and traffic routes used by the proposed project's traffic. Potential interaction between proposed land use and surrounding regional access routes are considered to identify probable routes onto which project traffic would distribute. The projected trip distribution for the proposed project is based on anticipated travel patterns to and from the project site.

**Exhibit 5** shows the projected trip distribution of proposed project's generated trips.





**Legend:**

-  Project Site
-  Study Intersection Location
-  (XX%) Percent Trip Distribution

## 5.0 OPENING YEAR PLUS PROJECT TRAFFIC CONDITIONS (OYP)

---

*Opening Year Plus Project Traffic Conditions (OYP)* analysis is intended to identify existing conditions with the proposed project.

### 5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for the OYP scenario are consistent with those previously shown in **Exhibit 3**.

### 5.2 CUMULATIVE PROJECTS

This analysis also accounts for the projected impact of other reasonably foreseeable development projects in the study area. These cumulative projects may be in various stages of planning, entitlement, and construction. A list of cumulative projects was developed for this analysis through consultation with City of Rialto staff. A summary of cumulative project land uses is shown in **Table 10**. Cumulative project locations are shown in **Exhibit 6**.

### 5.3 OYP TRAFFIC VOLUMES

*Opening Year Plus Project* conditions volumes were estimated based on a yearly growth rate of 2.6% per year from base year (2023) to the proposed project's estimated year of completion (2025).

$$\text{OYP Traffic Volumes} = (\text{Existing (2023) Counts} * 1.026^2) + \text{Cumulative Projects} + \text{Proposed Project}$$

**Exhibit 7** shows *Opening Year Plus Project* AM and PM peak hour volumes at the study intersections.

### 5.4 OYP INTERSECTION LEVEL OF SERVICE ANALYSIS

*Opening Year Plus Project* AM and PM peak hour intersection analysis is shown in **Table 8**. HCM analysis sheets are provided in **Appendix C**.

**Table 8**  
Intersection Analysis – OYP Traffic Conditions

Intersection			Control Type	Peak Hour	OYP Conditions	
					ICU/Delay <sup>1</sup>	LOS
1	North Union Road	West Lathrop Road	Signal	AM	43.70	D
				PM	50.30	D
2	Arrowsmith Drive	West Lathrop Road	TWSC	AM	21.15	C
				PM	17.03	C
3	West Lathrop Road	Project Driveway #1	TWSC	AM	13.19	B
				PM	13.66	B
4	North Union Road	Project Driveway #2	TWSC	AM	11.59	B
				PM	11.64	B

Note: TWSC = Two-Way Stop-Control; Delay shown in seconds per vehicle.

1 = Per the Highway Capacity Manual (HCM) 7th Edition, for signalized intersection, the overall average delay and LOS are shown. For intersections with one or two-way stop-control, the delay and LOS for the worst individual movement is shown.

As shown, the study intersections are projected to continue to operate at an acceptable LOS during the AM and PM peak hours for *Opening Year Plus Project* traffic conditions.

#### 5.5 OYP ROADWAY LEVEL OF SERVICE ANALYSIS

The roadway segment level of service analysis results for *Opening Year Plus Project* traffic conditions scenario are summarized in **Table 9**. Review of this table indicates that the study roadway segments are projected to continue to operate at an acceptable level of service on a daily basis.

**Table 9**  
Roadway Segment – OYP Traffic Conditions

Roadway	Segment	Classification	Existing Travel Lanes	LOS D Capacity	OYP ADT <sup>1</sup>	V/C	LOS
North Union Road	West Lathrop Road to Sprague Street	Arterial	4	32,500	19,356	0.507	B
West Lathrop Road	North Union Road to Arrowsmith Drive	Arterial	4	32,500	22,724	0.595	C

1: ADT = Average Daily Traffic based on 10% of peak hour volumes.

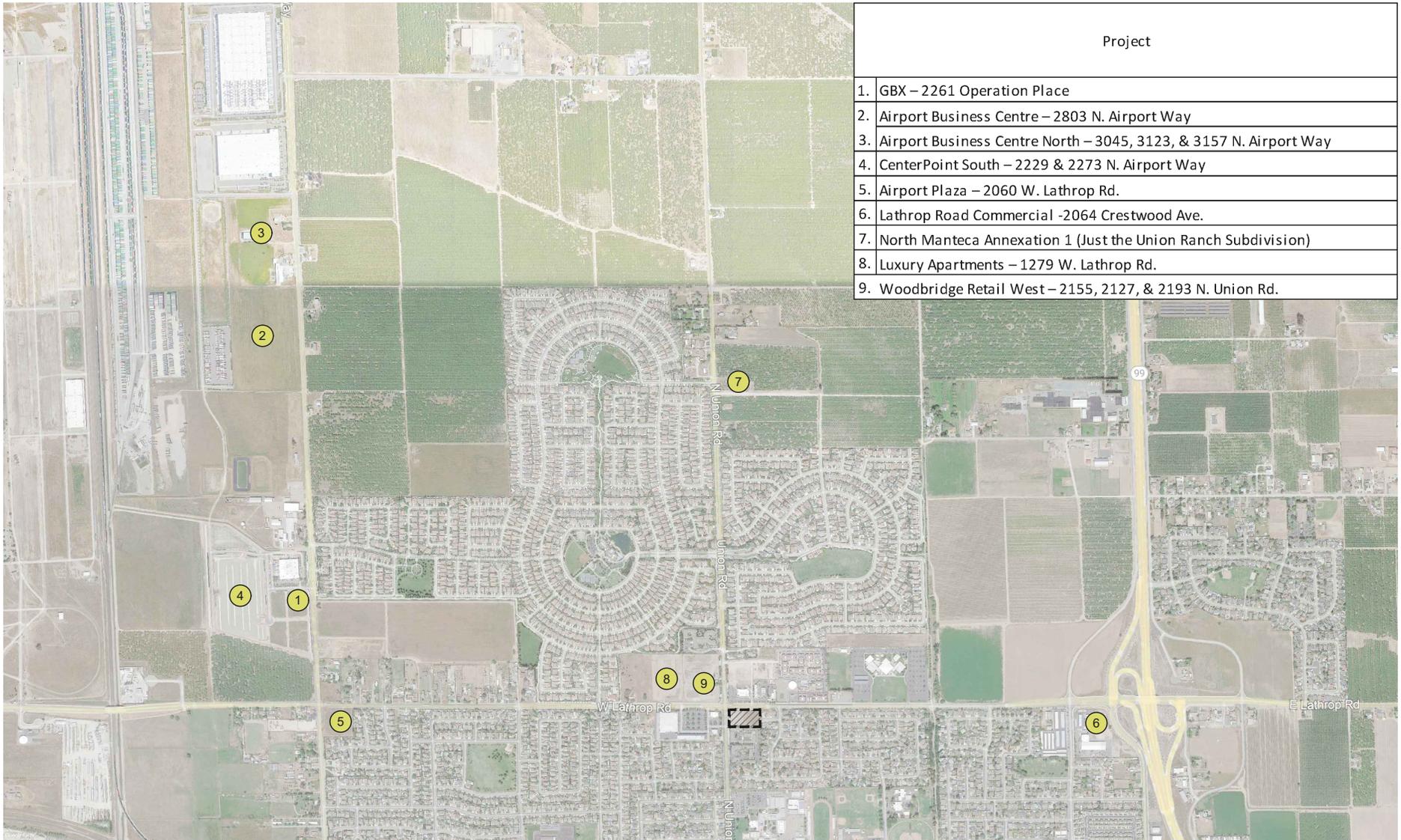
**Table 10**  
Cumulative Project Trip Generation

Project	Land Use <sup>1</sup>	ITE Code <sup>2</sup>	Qty	Unit <sup>3</sup>	Daily		AM Peak Hour			PM Peak Hour								
					Rate	Volume	Rate	In:Out Split	Volume			Rate	In:Out Split	Volume				
									In	Out	Total			In	Out	Total		
1. GBX – 2261 Operation Place	From reports provided		294,943	TSF		662			46	21	67			22	45	67		
2. Airport Business Centre – 2803 N. Airport Way	From reports provided		141,360	TSF		1,010			73	23	96			39	104	143		
3. Airport Business Centre North – 3045, 3123, & 3157 N. Airport Way	From reports provided		360	TSF		1,358			97	42	139			48	91	139		
4. CenterPoint South – 2229 & 2273 N. Airport Way	From reports provided		99,514	TSF		494			61	8	69			8	55	63		
5. Airport Plaza – 2060 W. Lathrop Rd.	From reports provided					6,150			78	70	148			81	70	151		
6. Lathrop Road Commercial -2064 Crestwood Ave.	Strip Retail Plaza (<40k)	822	8,402	TSF	54.45	457	2.36	60:40	12	8	20	6.59	50:50	28	27	55		
7. North Manteca Annexation 1 (Just the Union Ranch Subdivision)						5,214			94	273	367			307	180	487		
8. Luxury Apartments – 1279 W. Lathrop Rd.	Multifamily Housing (Low-Rise), Not Close to Rail Transit	220(1)	136,000	DU	6.74	917	0.4	24:76	13	41	54	0.51	63:37	43	26	69		
9. Woodbridge Retail West – 2155, 2127, & 2193 N. Union Rd.	From reports provided					4,254					320					313		
<b>Results</b>					<b>Daily</b>	<b>Volume</b>	<b>AM Peak Hour</b>			<b>In</b>	<b>Out</b>	<b>Total</b>	<b>PM Peak Hour</b>			<b>In</b>	<b>Out</b>	<b>Total</b>
Subtotal						20,516				474	486	1,280				576	598	1,487
Pass-By Trips						0				0	0	0				0	0	0
<b>Net Total</b>						<b>20,516</b>				<b>474</b>	<b>486</b>	<b>1,280</b>				<b>576</b>	<b>598</b>	<b>1,487</b>

1: Trip generation and pass-by rates from ITE Trip Generation (11th Edition, 2021).

2: Parentheses reflect subcategory of land use code. For example, 945(2) is only convenience stores/gas stations with a general floor area (GFA) of 2-4k square feet and >8 VFPs.

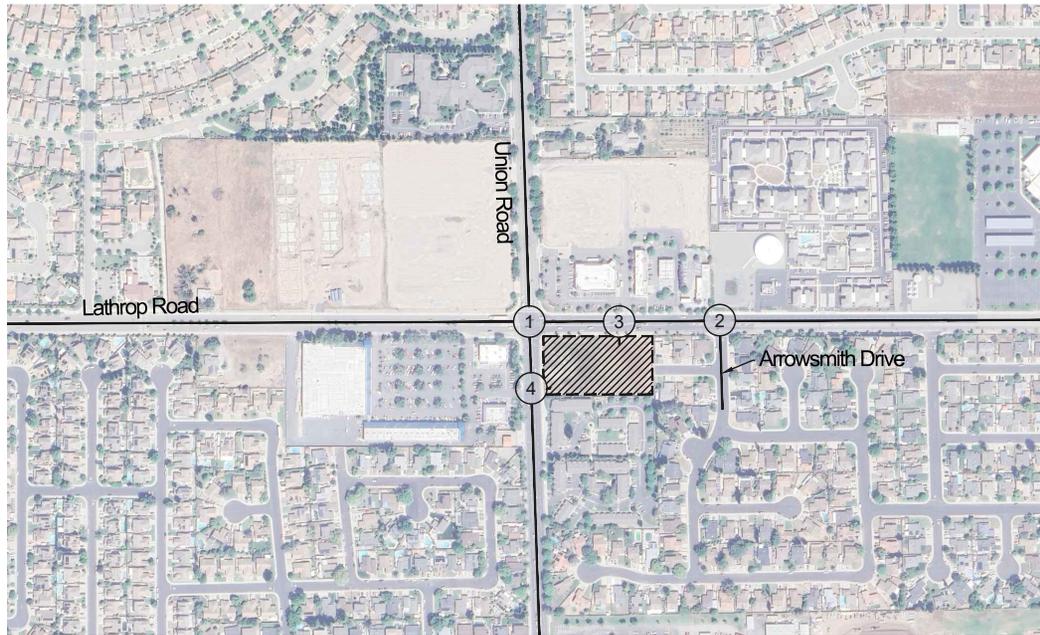
3: RM = Rooms; TSF = Thousand Square Feet; VFP = Vehicle Fueling Positions; DU = Dwelling Units.



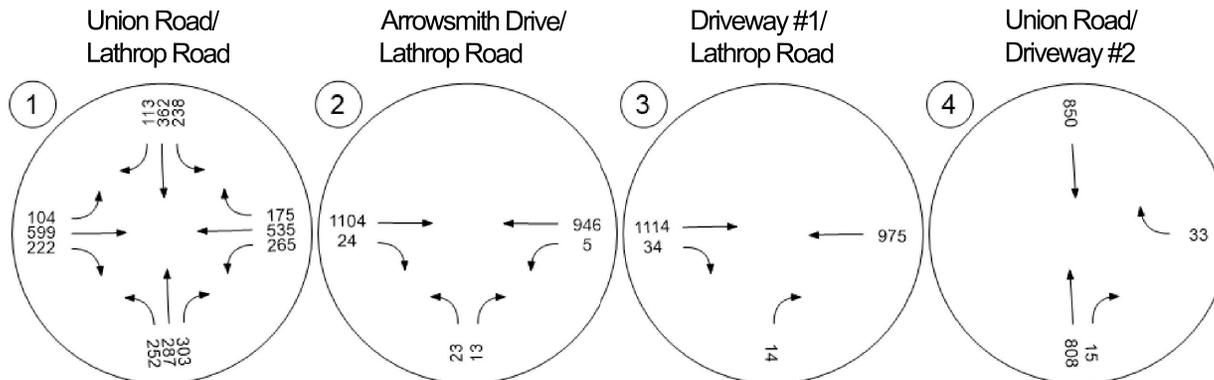
Project	
1.	GBX – 2261 Operation Place
2.	Airport Business Centre – 2803 N. Airport Way
3.	Airport Business Centre North – 3045, 3123, & 3157 N. Airport Way
4.	CenterPoint South – 2229 & 2273 N. Airport Way
5.	Airport Plaza – 2060 W. Lathrop Rd.
6.	Lathrop Road Commercial -2064 Crestwood Ave.
7.	North Manteca Annexation 1 (Just the Union Ranch Subdivision)
8.	Luxury Apartments – 1279 W. Lathrop Rd.
9.	Woodbridge Retail West – 2155, 2127, & 2193 N. Union Rd.

**Legend:**

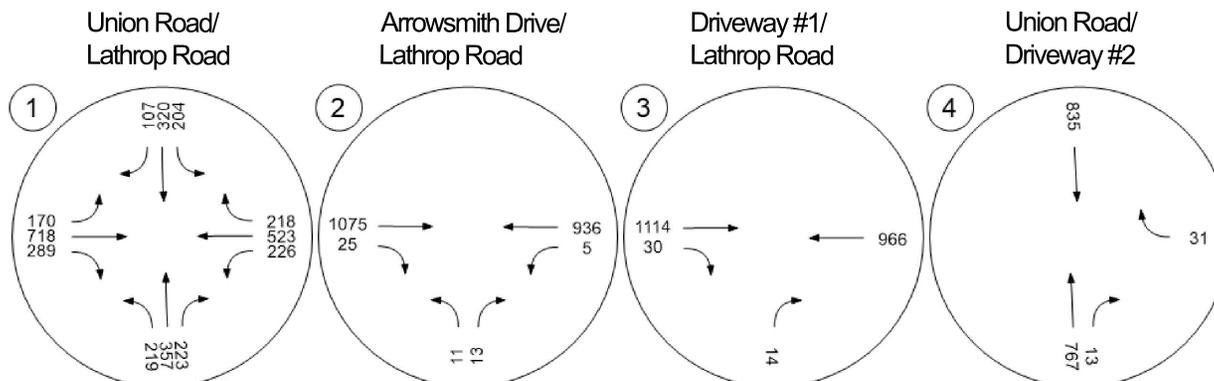
-  Approximate Cumulative Project Locations
-  Project Site



AM Peak Hour Volumes



PM Peak Hour Volumes



## 6.0 CUMULATIVE WITHOUT PROJECT TRAFFIC CONDITIONS (CNP)

---

*Cumulative Without Project* (CNP) traffic conditions analysis is intended identify baseline conditions with cumulative projects in the City of Manteca horizon year 2040 and without the proposed project.

### 6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for the *Cumulative Without Project* traffic scenario are consistent with those previously shown in **Exhibit 3**.

### 6.2 CUMULATIVE PROJECTS

This analysis also accounts for the projected impact of other reasonably foreseeable development projects in the study area. These cumulative projects may be in various stages of planning, entitlement, and construction. Section 5.2 provides a summary of the cumulative projects.

### 6.3 CNP TRAFFIC VOLUMES

*Cumulative Without Project* conditions volumes were estimated based on yearly growth rates from current year (2023) to horizon year (2040) in the City of Manteca model. An annual growth rate of 2.6% was applied up to year 2028, followed by a 1% annual growth rate from 2029 to 2040.

$$\text{Cumulative Without Project Traffic Volumes} = (\text{Existing (2023) Counts} * 1.026^6 * 1.01^{12} + \text{Cumulative Projects})$$

**Exhibit 8** shows *Cumulative Without Project* AM and PM peak hour volumes at the study intersections.

### 6.4 CNP INTERSECTION LEVEL OF SERVICE ANALYSIS

*Cumulative Without Project* AM and PM peak hour intersection analysis is shown in **Table 11**. HCM analysis sheets are provided in **Appendix C**.



**Table 11****Intersection Analysis – CNP Traffic Conditions**

Intersection			Control Type	Peak Hour	CNP Conditions	
					ICU/Delay <sup>1</sup>	LOS
1	North Union Road	West Lathrop Road	Signal	AM	49.70	D
				PM	49.80	D
2	Arrowsmith Drive	West Lathrop Road	OWSC	AM	22.86	C
				PM	18.87	C

Note: AWSC = OWSC = One-Way Stop Control, Delay shown in seconds per vehicle.

1 = Per the Highway Capacity Manual 7th Edition, for signalized intersection, the overall average delay and LOS are shown. For intersections with one or two-way stop-control, the delay and LOS for the worst individual movement is shown.

As shown in **Table 11**, the study intersections are projected to continue to operate at an acceptable LOS during the AM and PM peak hours for *Cumulative Without Project* traffic conditions.

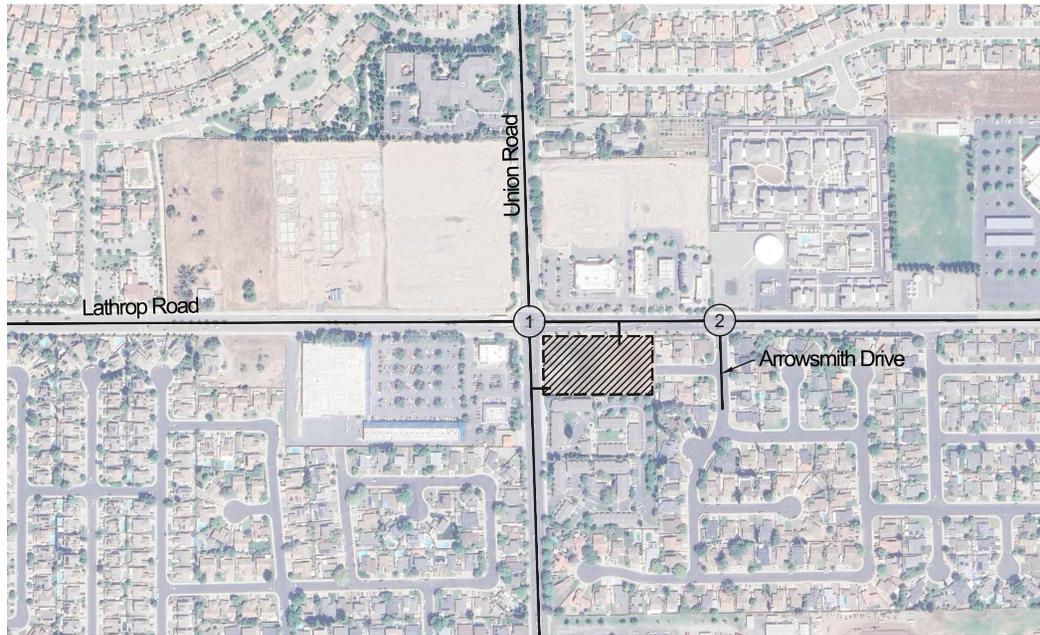
## 6.5 CNP ROADWAY LEVEL OF SERVICE ANALYSIS

The roadway segment level of service analysis results for *Cumulative Without Project* traffic conditions scenario are summarized in **Table 12**. Review of this table indicates that the study roadway segments are projected to continue to operate at an acceptable level of service on a daily basis.

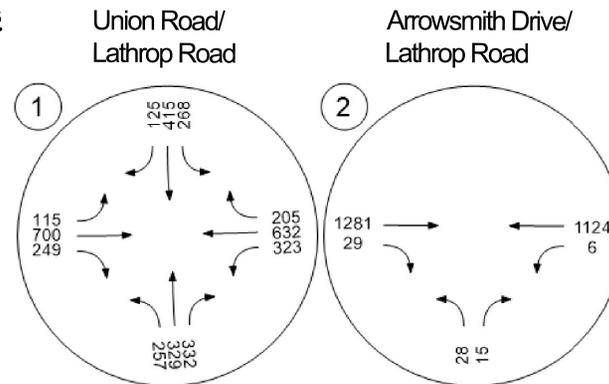
**Table 12****Roadway Segment – CNP Traffic Conditions**

Roadway	Segment	Classification	Existing Travel Lanes	LOS D Capacity	CNP ADT <sup>1</sup>	V/C	LOS
North Union Road	West Lathrop Road to Sprague Street	Arterial	4	32,500	21,496	0.563	C
West Lathrop Road	North Union Road to Arrowsmith Drive	Arterial	4	32,500	26,155	0.685	D

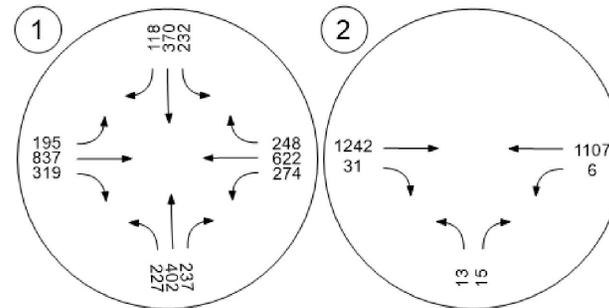
1: ADT = Average Daily Traffic based on 10% of peak hour volumes.



AM Peak Hour Volumes



PM Peak Hour Volumes



## 7.0 CUMULATIVE PLUS PROJECT TRAFFIC CONDITIONS (CWP)

---

*Cumulative Plus Project Traffic (CWP)* conditions analysis is intended to identify the project-related impacts on both the existing and planned City of Manteca horizon year (2040) circulation system.

### 7.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for the *Cumulative Plus Project* traffic scenario are consistent with those previously shown in **Exhibit 3**.

### 7.2 CUMULATIVE PROJECTS

This analysis also accounts for the projected impact of other reasonably foreseeable development projects in the study area. These cumulative projects may be in various stages of planning, entitlement, and construction. Section 5.2 provides a summary of the cumulative projects.

### 7.3 CWP TRAFFIC VOLUMES

*Cumulative Plus Project* conditions volumes were estimated based on yearly growth rates from current year (2023) to horizon year (2040) in the City of Manteca model. An annual growth rate of 2.6% was applied up to year 2028, followed by a 1% annual growth rate from 2029 to 2040.

$$\text{Cumulative Plus Project Traffic Volumes} = (\text{Existing (2023) Counts} * 1.026^6 * 1.01^{12}) + \text{Cumulative Projects} + \text{Proposed Project}$$

**Exhibit 9** shows *Cumulative Plus Project* traffic AM and PM peak hour volumes at the study intersections.

### 7.4 CWP INTERSECTION LEVEL OF SERVICE ANALYSIS

*Cumulative Plus Project* traffic conditions AM and PM peak hour intersection analysis is shown in **Table 13**. HCM analysis sheets are provided in **Appendix C**.

**Table 13**

## Intersection Analysis – CWP Conditions

Intersection			Control Type	Peak Hour	CNP Conditions		CWP Conditions		Change	Impact?
					ICU/Delay <sup>1</sup>	LOS	ICU/Delay <sup>1</sup>	LOS		
1	North Union Road	West Lathrop Road	Signal	AM	49.70	D	53.60	D	3.9	No
				PM	49.80	D	51.20	D	1.4	No
2	Arrowsmith Drive	West Lathrop Road	TWSC	AM	22.86	C	23.50	C	0.6	No
				PM	18.87	C	19.28	C	0.4	No
3	West Lathrop Road	Project Driveway #1	TWSC	AM			14.36	B		
				PM			14.30	B		
4	North Union Road	Project Driveway #2	TWSC	AM			12.07	B		
				PM			11.73	B		

Note: OWSC = One-Way Stop Control; Delay shown in seconds per vehicle.

1 = Per the Highway Capacity Manual 7th Edition, overall average delay and LOS are shown for signalized intersections. For intersections with one-or-two-way stop-control, the delay and LOS for the worst individual movement is shown.

As shown in **Table 13**, the study intersections are projected to continue to operate at an acceptable LOS during the AM and PM peak hours for *Cumulative Plus Project* traffic conditions.

## 7.5 CWP ROADWAY LEVEL OF SERVICE ANALYSIS

The roadway segment level of service analysis results for *Cumulative Plus Project* traffic conditions scenario are summarized in **Table 14**. Review of this table indicates that the study roadway segments are projected to continue to operate at an acceptable level of service on a daily basis.

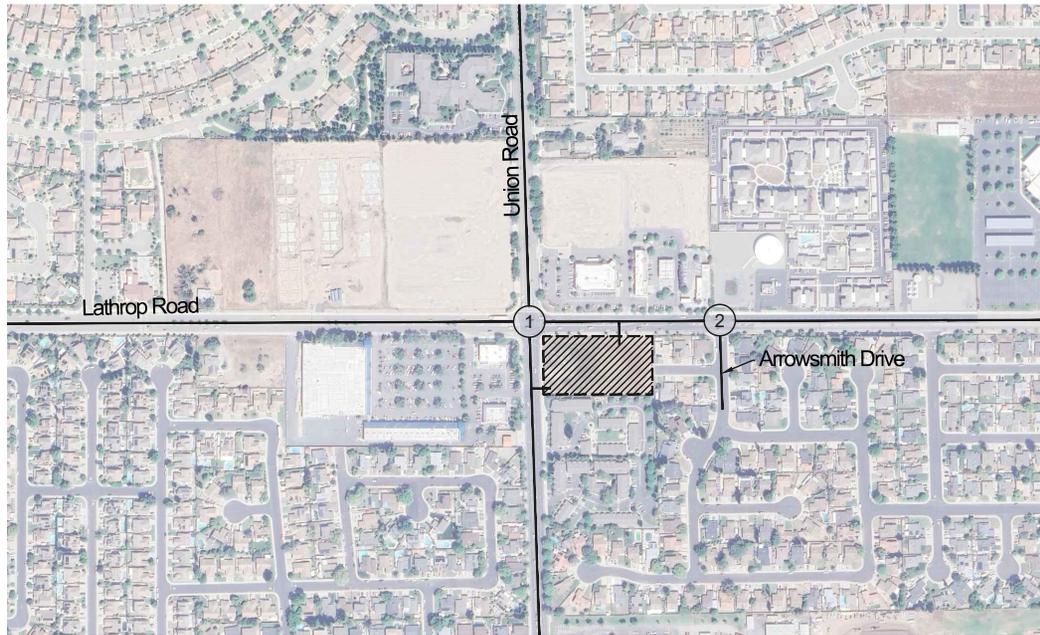
**Table 14**

## Roadway Segment – CWP Traffic Conditions

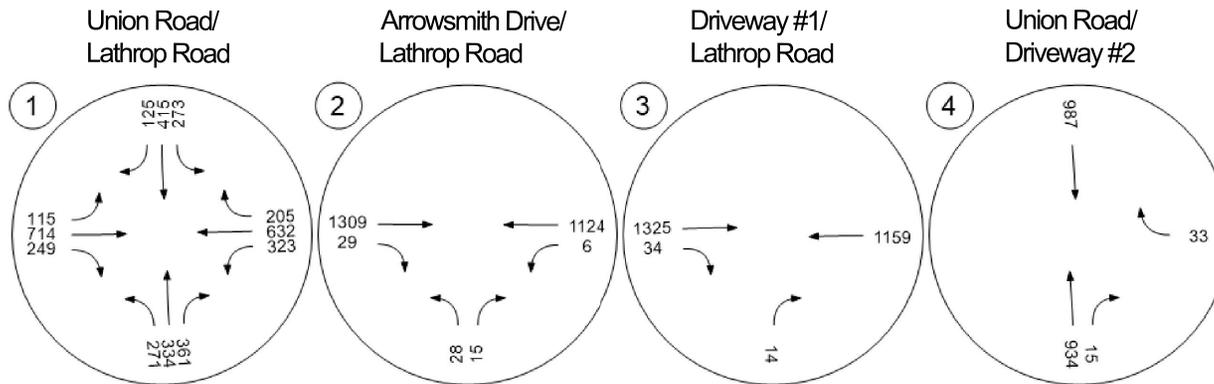
Roadway	Segment	Classification	Existing Travel Lanes	LOS D Capacity	CWP ADT <sup>1</sup>	V/C	LOS
North Union Road	West Lathrop Road to Sprague Street	Arterial	4	32,500	21,988	0.576	C
West Lathrop Road	North Union Road to Arrowsmith Drive	Arterial	4	32,500	26,647	0.698	D

1: ADT = Average Daily Traffic based on 10% of peak hour volumes.

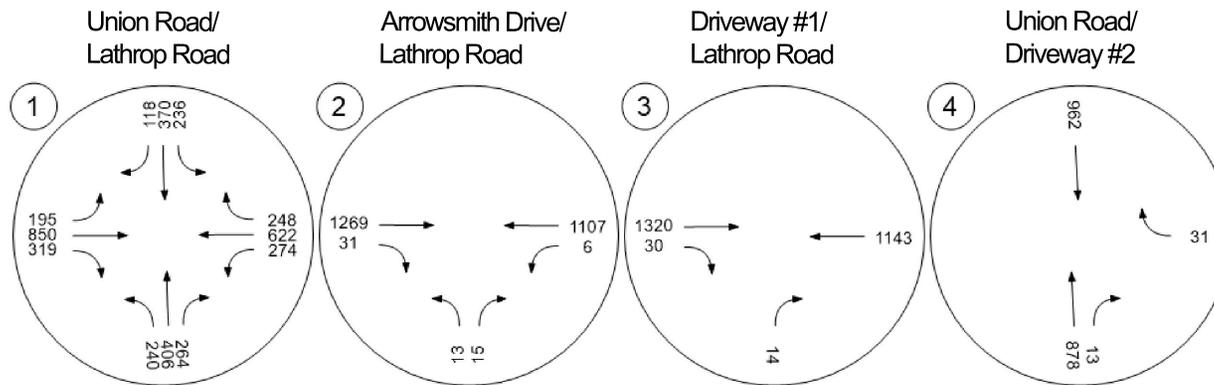




AM Peak Hour Volumes



PM Peak Hour Volumes





**APPENDIX A**

SCOPING AGREEMENT AND CITY DOCS

## David Chew

---

**From:** Fenrich, Mallorie <mfenrich@manteca.gov>  
**Sent:** Thursday, November 16, 2023 7:56 AM  
**To:** David Chew  
**Cc:** Maria Ruvalcaba; Travis Yokota; Daniel Flores; Simvoulakis, Lea  
**Subject:** RE: Crossroads Plaza (2064 North Union Road)

Great, provided the items below are addressed in the traffic report, we are supportive.

I will see if we can get you a list of cumulative projects in the area we would like you to include.

Thank you,



**Mallorie Fenrich, Senior Planner, MUP, CPD**

City of Manteca | Development Services Department  
1215 W. Center St., Suite 201 | Manteca, CA 95337  
Office: 209.456.8514  
[manteca.gov](http://manteca.gov)

---

**From:** David Chew <david@tjwengineering.com>  
**Sent:** Tuesday, November 7, 2023 5:27 PM  
**To:** Fenrich, Mallorie <mfenrich@manteca.gov>  
**Cc:** Maria Ruvalcaba <Maria@saalem.net>; Travis Yokota <Travis@tjwengineering.com>; Daniel Flores <Daniel@tjwengineering.com>  
**Subject:** RE: Crossroads Plaza (2064 North Union Road)

**WARNING!** This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Mallorie,

Thank you for sending the review on the scoping. Please see below responses:

- Truck turn templates for the gas trucks showing movements entering, exiting, and throughout the site.
  - o The project team will include truck turning templates with the application/site plan.
- Show that trucks will stay in their lane when entering and exiting the site.
  - o Same as above, these turning exhibits will be provided by the project team.
- Please note that a median will be required on Union Road so this may affect access. The whole site will be right-in/right-out.
  - o Confirmed, we will assume right-in/right-out for all driveways.
- This site will not have access to Nunes Court.
  - o Confirmed/noted, there will be no access to Nunes Court.
- What will the impacts be for Arrowsmith Drive and Lathrop Road?

- We will include this intersection in our analysis to determine any potential impacts.

We will perform the traffic analysis per the emailed scope from October 3<sup>rd</sup> with the addition of the above notes.

In addition, can we get a list of cumulative projects within the area that the City would like us to account for/include in our analysis?

Thanks,

---

**From:** Fenrich, Mallorie <[mfenrich@manteca.gov](mailto:mfenrich@manteca.gov)>  
**Sent:** Tuesday, October 24, 2023 4:29 PM  
**To:** David Chew <[david@tjwengineering.com](mailto:david@tjwengineering.com)>  
**Cc:** Maria Ruvalcaba <[Maria@saalem.net](mailto:Maria@saalem.net)>; Simvoulakis, Lea <[lsimvoulakis@manteca.gov](mailto:lsimvoulakis@manteca.gov)>  
**Subject:** RE: Crossroads Plaza (2064 North Union Road)

Hi David,

The scope will also need to include the following:

- Truck turn templates for the gas trucks showing movements entering, exiting, and throughout the site.
- Show that trucks will stay in their lane when entering and exiting the site.
- Please note that a median will be required on Union Road so this may affect access. The whole site will be right-in/right-out.
- This site will not have access to Nunes Court.
- What will the impacts be for Arrowsmith Drive and Lathrop Road?

Thank you,



**Mallorie Fenrich, Senior Planner, MUP, CPD**  
City of Manteca | Development Services Department  
1215 W. Center St., Suite 201 | Manteca, CA 95337  
Office: 209.456.8514  
[manteca.gov](http://manteca.gov)

---

**From:** David Chew <[david@tjwengineering.com](mailto:david@tjwengineering.com)>  
**Sent:** Tuesday, October 24, 2023 10:48 AM  
**To:** Fenrich, Mallorie <[mfenrich@manteca.gov](mailto:mfenrich@manteca.gov)>  
**Cc:** Maria Ruvalcaba <[Maria@saalem.net](mailto:Maria@saalem.net)>  
**Subject:** RE: Crossroads Plaza (2064 North Union Road)

**WARNING!** This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Mallorie,

Wanted to follow up on this and see if you've heard back from Engineering yet.

Thanks,

**David Chew, PTP**

Transportation Planning Manager

TJW Engineering

T. 949.878.3509

D. 949.536.8450

---

**From:** Fenrich, Mallorie <[mfenrich@manteca.gov](mailto:mfenrich@manteca.gov)>  
**Sent:** Wednesday, October 11, 2023 8:52 AM  
**To:** David Chew <[david@tjwengineering.com](mailto:david@tjwengineering.com)>  
**Subject:** RE: Crossroads Plaza (2064 North Union Road)

Hi David,

I apologize for the delay. I am waiting to hear back from Engineering that they are okay with the scope.

Thank you,



**Mallorie Fenrich, Senior Planner, MUP, CPD**

City of Manteca | Development Services Department

1215 W. Center St., Suite 201 | Manteca, CA 95337

Office: 209.456.8514

[manteca.gov](http://manteca.gov)

---

**From:** David Chew <[david@tjwengineering.com](mailto:david@tjwengineering.com)>  
**Sent:** Monday, October 9, 2023 1:08 PM  
**To:** Fenrich, Mallorie <[mfenrich@manteca.gov](mailto:mfenrich@manteca.gov)>  
**Cc:** Bahr, David <[dbahr@manteca.gov](mailto:dbahr@manteca.gov)>; Maria Ruvalcaba <[Maria@salem.net](mailto:Maria@salem.net)>  
**Subject:** RE: Crossroads Plaza (2064 North Union Road)

**WARNING!** This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hello Mallore,

Wanted to follow up on the below email.

Thanks,

## David Chew, PTP

Transportation Planning Manager

TJW Engineering

T. 949.878.3509

D. 949.536.8450

---

**From:** David Chew

**Sent:** Tuesday, October 3, 2023 4:47 PM

**To:** [mfenrich@manteca.gov](mailto:mfenrich@manteca.gov)

**Cc:** [dbahr@manteca.gov](mailto:dbahr@manteca.gov); Maria Ruvalcaba <[Maria@saalem.net](mailto:Maria@saalem.net)>

**Subject:** Crossroads Plaza (2064 North Union Road)

Hello Mallore,

We are working with Maria Ruvalcaba (cc'd) on the Crossroads Plaza Traffic Analysis located at 2064 North Union Road. The proposed project includes a 12-pump gas station with a 5,200 square foot convenience store and a 6,816 square foot auto supply store. A site plan is attached for reference.

In response to the comments provided by the City, we will look at the following as part of the scope for our TIA.

- Study Area Intersection:
  - Lathrop Road / Union Road
  - Lathrop Road / Project Driveway
  - Union Road / Project Driveway
- Study Area Roadway Segments:
  - Union Road south of Lathrop Road
  - Lathrop Road east of Union Road
- Study Scenarios:
  - Existing Conditions
  - Opening Year Plus Proposed Project (Opening Year with Cumulative Projects and Proposed Project)
  - Cumulative Conditions (Horizon Year 2040 with Cumulative Projects)
  - Cumulative Conditions with Project (Horizon Year 2040 with Cumulative Projects and Proposed Project)
- Additional scoping related items:
  - The study will review traffic impacts during the AM and PM peak hour periods of 7-9AM and 4-6PM.
  - Trip Generation will be based on latest ITE Trip Generation Manual and trip distribution/assignment will be based on proposed projects and the general area.
  - Annual growth rate of 2.6% will be applied up to year 2028, followed by a 1% growth rate applied from 2029 to year 2040.
  - Cumulative projects will be determined as projects within 0.5 radius of our site
    - City to provide list of cumulative projects
  - VMT analysis – Project will be screened via local serving project as outlined per OPR guidelines

If the above is sufficient, we will consider this proposed project to be scoped as such, and we will be moving forward with the data collection efforts.

Please let us know if you have any questions/concerns.

Thank you,

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**Table C-1: Street Classifications**

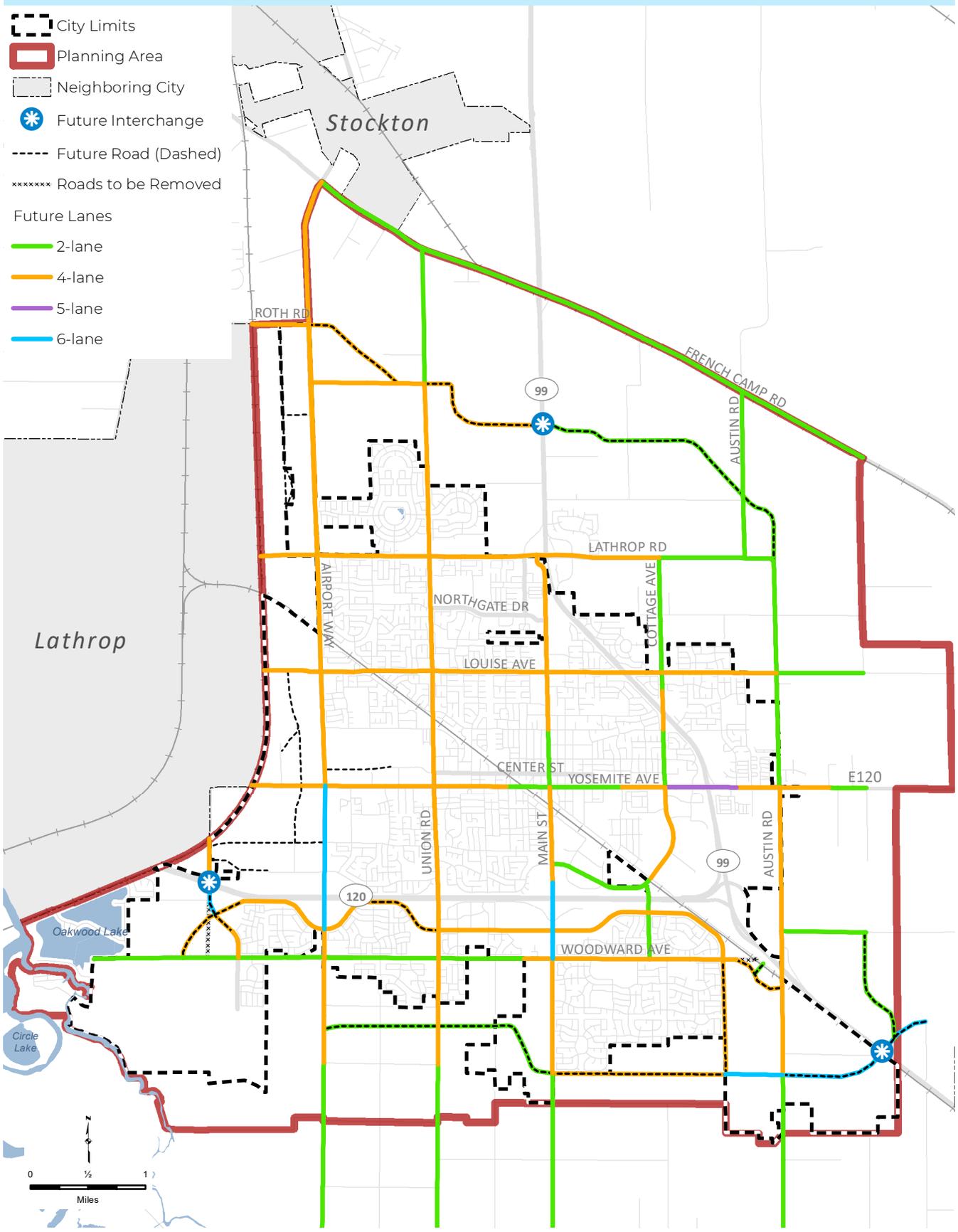
Street Type	Description
<b>Parkway</b>	High-capacity thoroughfare, typically four to six lanes, focused on vehicular traffic with limited property frontages. Aesthetically appealing with landscaped median islands. Provides regional access to adjacent land uses and safe crossings for all travel modes along a regional transportation corridor. Intersections typically require a ½ mile separation. Pedestrians and bicycles accommodated in a landscape-separated path. Emphasizes regional vehicle trips through collaborations with other cities and agencies. On-street motor vehicle parking typically prohibited.
<b>Arterial</b>	Major thoroughfare, typically four lanes, focused on through traffic and public transit, with access for major local traffic generators, such as commercial, industrial, institutional, and large high-density housing complexes. Pedestrian sidewalks and Class II or IV bicycle facilities provided on both sides of the street. Curbside landscaping and landscaped medians encouraged. Restriping with narrower lanes allowed where necessary to close gaps in pedestrian and bicycle system. Provides access and safe crossings for all travel modes. On-street vehicle parking is typically prohibited.
<b>Main Street Arterial</b>	Pedestrian-oriented street, typically two lanes, with primarily retail, mixed-use, or recreation uses. Provides access to all travel modes in support of typical “main street” land uses and includes on-street motor vehicle and bicycle parking. Service to pedestrian-oriented retail is of prime importance. Provides enhancements for walking and transit, including bulb-outs to reduce pedestrian crossing distances. On-street motor vehicle parking may be permitted where feasible to enhance access to adjacent uses.
<b>Major Collector</b>	Major collector streets, typically two to four lanes, serve as smaller-scale parallel routes to arterial streets and provide access to neighborhoods. Examples include Center Street, Powers Avenue, and Daniels Street west of Airport Way. Major collector streets will typically provide two travel lanes, a Class II bike lane or Class IV separated bikeway and a sidewalk on both sides. Median islands and turn lanes may be appropriate in certain conditions. For newly constructed major collector streets, on-street parking should be prohibited to reduce pavement width, pedestrian crossing distances, and maintenance costs. On-street parking for existing major collector streets should be restricted or limited by eliminating the parking lane or through the use of bulb-outs to minimize the cross section and discourage speeding.



# Manteca General Plan

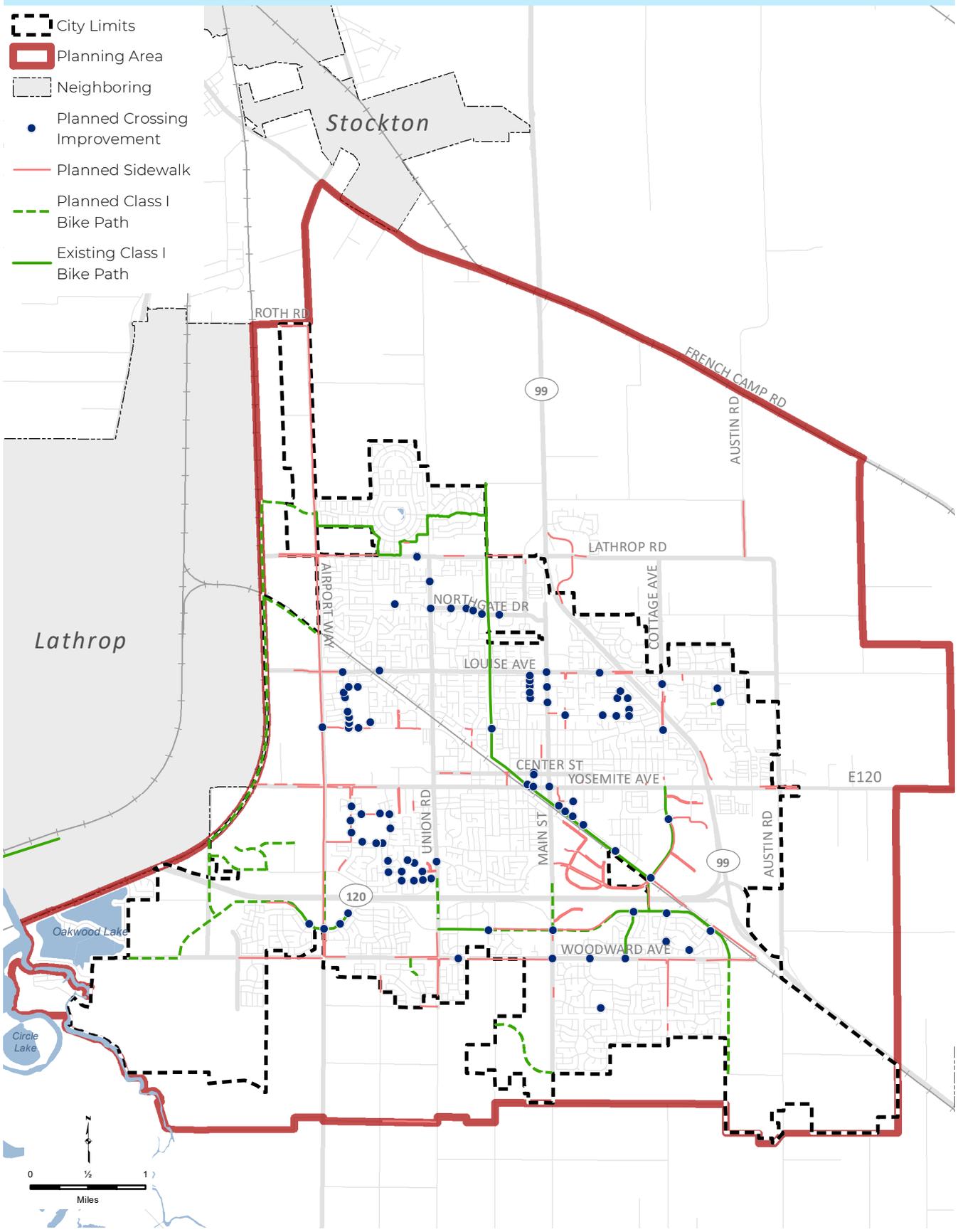
Street Type	Description
<p><b>Minor Collector</b></p>	<p>Minor collector streets, typically two lanes, serve as the backbone circulation routes within larger neighborhoods and commercial/industrial areas, providing primary access to commercial and industrial uses and linking low volume residential streets to major collector and arterial streets. Minor collector streets should be small scale, two lane streets. The streets should be wide enough to safely accommodate traffic flows, but not so wide as to encourage high-speed travel. Depending on the surrounding land uses (e.g., office, commercial, or residential areas), the minor collector may accommodate Class II bike lanes. Sidewalks should be provided on each side of the street.</p>
<p><b>Residential Streets</b></p>	<p>While they carry relatively light traffic loads, residential streets, typically two lanes, constitute the majority of Manteca's street system. These streets are intended to serve residential driveways, providing access between homes and larger streets. These streets should include narrow travel and parking lanes to slow travel and discourage through trips and sidewalks on both sides of the street. Features like corner bulb-outs and traffic circles (a smaller version of a roundabout) should be incorporated to improve the aesthetic quality of the street, while calming traffic. Class III bike routes and special pavement markings for bicycles should be provided where appropriate to provide continuity for the bicycle system. Where a residential street ends in a cul-de-sac, a shared bicycle/pedestrian path should be constructed to connect the cul-de-sac to other residential, collector, or arterial streets to shorten travel distances and encourage the use of these modes.</p>
<p><b>Intersections of City Streets</b></p>	<p>Intersections are critical components of the street network since they tend to define how well the system operates. Drivers and transit users typically experience most of their traveling delay at intersections. Intersections are important for pedestrians and bicycles since they provide controlled points where these modes can cross major roadways. In general, intersections should have minimum lane widths to serve the type of vehicles expected on the roadway (e.g., lanes should be sufficiently wide to accommodate trucks in industrial areas). Narrower lanes pose less of a barrier for pedestrians to cross and reduce maintenance costs. Where there is demand, u-turn movements should be accommodated in the intersection design to the extent feasible to extend the length of landscaped medians. Bus bays should be included in intersection designs for expressways, arterials, and major collectors to maintain traffic flow while buses are loading and unloading.</p>

# Figure C-1: Major Streets Circulation Plan



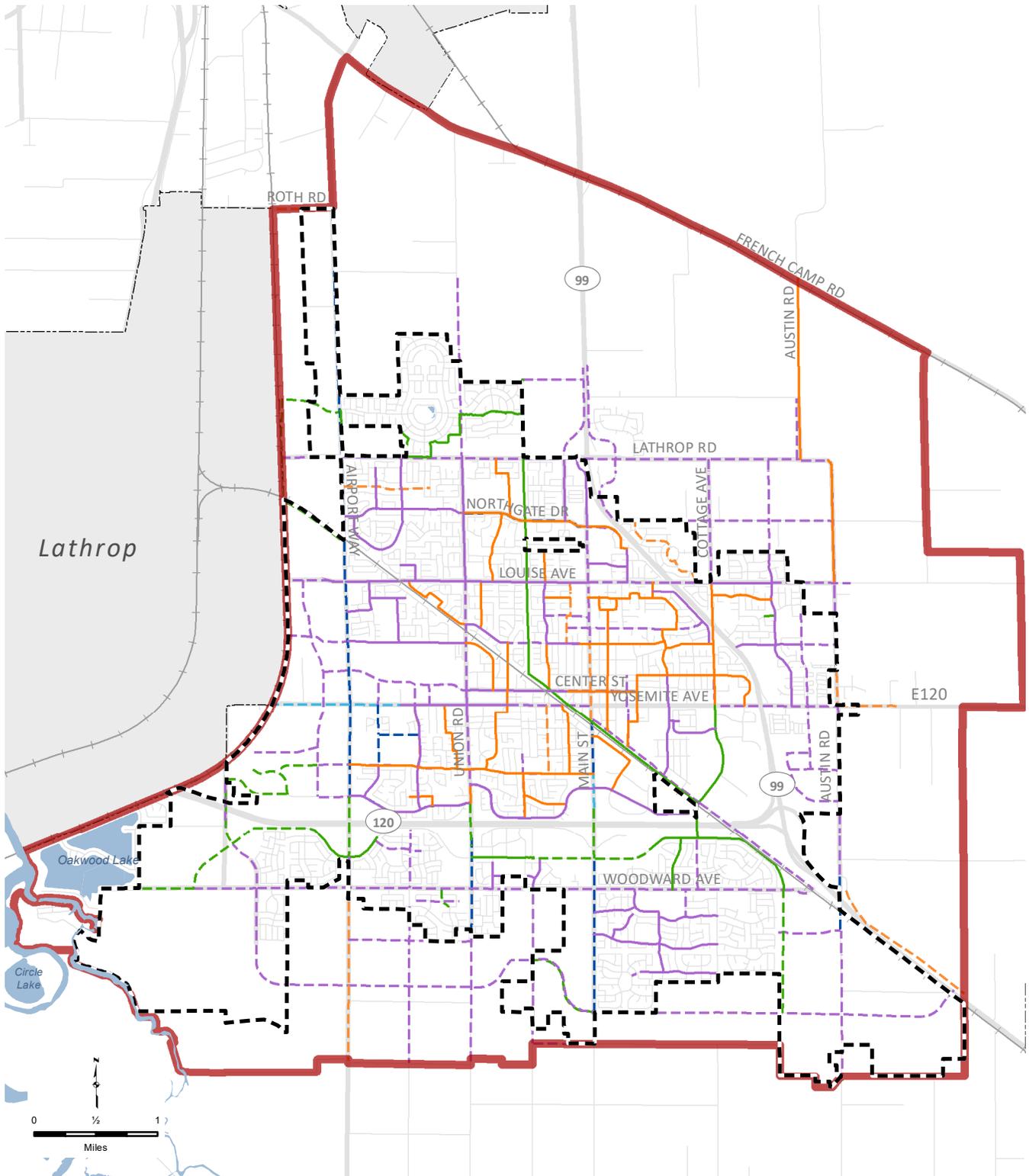
*Future alignments are conceptual and will be refined at the time the improvement is planned for funding.*

# Figure C-2: Active Transportation Plan - Pedestrian Network



# Figure C-3: Active Transportation Plan - Bicycle Network

- |  |   |   |  |
|--|---|---|--|
|  City Limits      | Existing Bicycle Facilities   | Planned Bicycle Facilities  |  |
|  Planning Area    |  Class I - Multi-Use Path  |  Class I Bike Path             |  Class III Bike Route       |
|  Neighboring City |  Class II - Bicycle Lane   |  Class II Bike Lanes          |  Class IV Separated Bikeway |
|  |  Class III - Bicycle Route |  Class II Buffered Bike Lanes |  |



## APPENDIX B

### EXISTING TRAFFIC COUNTS AND MODEL VOLUMES

City of Manteca  
 N/S: Union Road  
 E/W: Lathrop Road  
 Weather: Clear

File Name : 01\_MTC\_Union\_Lathrop AM  
 Site Code : 231098  
 Start Date : 11/14/2023  
 Page No : 1

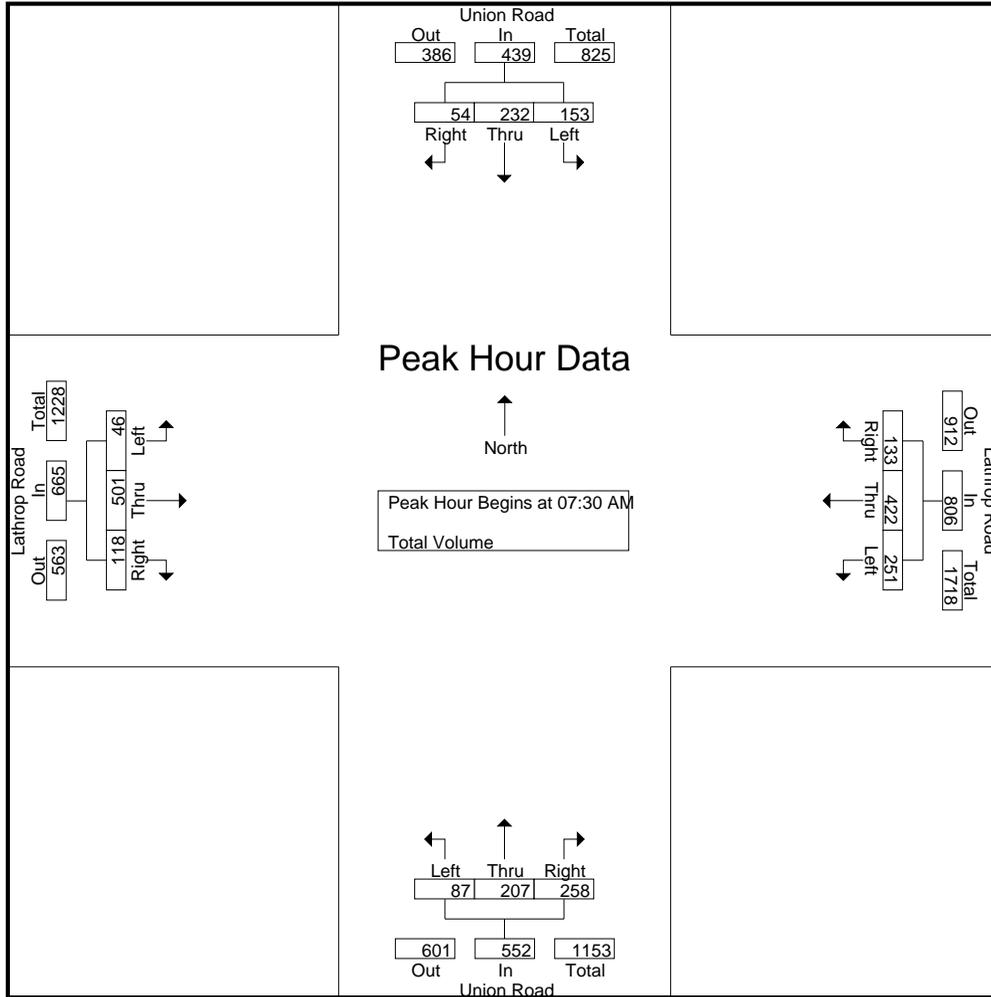
Groups Printed- Total Volume

Start Time	Union Road Southbound				Lathrop Road Westbound				Union Road Northbound				Lathrop Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	26	23	6	55	22	71	27	120	17	46	26	89	5	81	9	95	359
07:15 AM	33	28	13	74	43	91	24	158	19	21	55	95	7	116	11	134	461
07:30 AM	43	39	22	104	59	136	37	232	24	37	51	112	6	118	18	142	590
07:45 AM	34	42	15	91	62	139	32	233	14	46	86	146	12	125	21	158	628
Total	136	132	56	324	186	437	120	743	74	150	218	442	30	440	59	529	2038
08:00 AM	43	65	7	115	66	69	32	167	24	71	66	161	19	143	46	208	651
08:15 AM	33	86	10	129	64	78	32	174	25	53	55	133	9	115	33	157	593
08:30 AM	25	45	11	81	53	78	24	155	25	60	85	170	12	91	23	126	532
08:45 AM	22	38	11	71	39	64	28	131	18	30	45	93	17	98	23	138	433
Total	123	234	39	396	222	289	116	627	92	214	251	557	57	447	125	629	2209
Grand Total	259	366	95	720	408	726	236	1370	166	364	469	999	87	887	184	1158	4247
Apprch %	36	50.8	13.2		29.8	53	17.2		16.6	36.4	46.9		7.5	76.6	15.9		
Total %	6.1	8.6	2.2	17	9.6	17.1	5.6	32.3	3.9	8.6	11	23.5	2	20.9	4.3	27.3	

Start Time	Union Road Southbound				Lathrop Road Westbound				Union Road Northbound				Lathrop Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	43	39	22	104	59	136	37	232	24	37	51	112	6	118	18	142	590
07:45 AM	34	42	15	91	62	139	32	233	14	46	86	146	12	125	21	158	628
08:00 AM	43	65	7	115	66	69	32	167	24	71	66	161	19	143	46	208	651
08:15 AM	33	86	10	129	64	78	32	174	25	53	55	133	9	115	33	157	593
Total Volume	153	232	54	439	251	422	133	806	87	207	258	552	46	501	118	665	2462
% App. Total	34.9	52.8	12.3		31.1	52.4	16.5		15.8	37.5	46.7		6.9	75.3	17.7		
PHF	.890	.674	.614	.851	.951	.759	.899	.865	.870	.729	.750	.857	.605	.876	.641	.799	.945

City of Manteca  
 N/S: Union Road  
 E/W: Lathrop Road  
 Weather: Clear

File Name : 01\_MTC\_Union\_Lathrop AM  
 Site Code : 231098  
 Start Date : 11/14/2023  
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:45 AM				07:30 AM			
+0 mins.	<b>43</b>	39	<b>22</b>	104	59	136	<b>37</b>	232	14	46	<b>86</b>	146	6	118	18	142
+15 mins.	34	42	15	91	62	<b>139</b>	32	<b>233</b>	24	<b>71</b>	66	161	12	125	21	158
+30 mins.	43	65	7	115	<b>66</b>	69	32	167	<b>25</b>	53	55	133	<b>19</b>	<b>143</b>	<b>46</b>	<b>208</b>
+45 mins.	33	<b>86</b>	10	<b>129</b>	64	78	32	174	25	60	85	<b>170</b>	9	115	33	157
Total Volume	153	232	54	439	251	422	133	806	88	230	292	610	46	501	118	665
% App. Total	34.9	52.8	12.3		31.1	52.4	16.5		14.4	37.7	47.9		6.9	75.3	17.7	
PHF	.890	.674	.614	.851	.951	.759	.899	.865	.880	.810	.849	.897	.605	.876	.641	.799

City of Manteca  
 N/S: Union Road  
 E/W: Lathrop Road  
 Weather: Clear

File Name : 01\_MTC\_Union\_Lathrop PM  
 Site Code : 231098  
 Start Date : 11/14/2023  
 Page No : 1

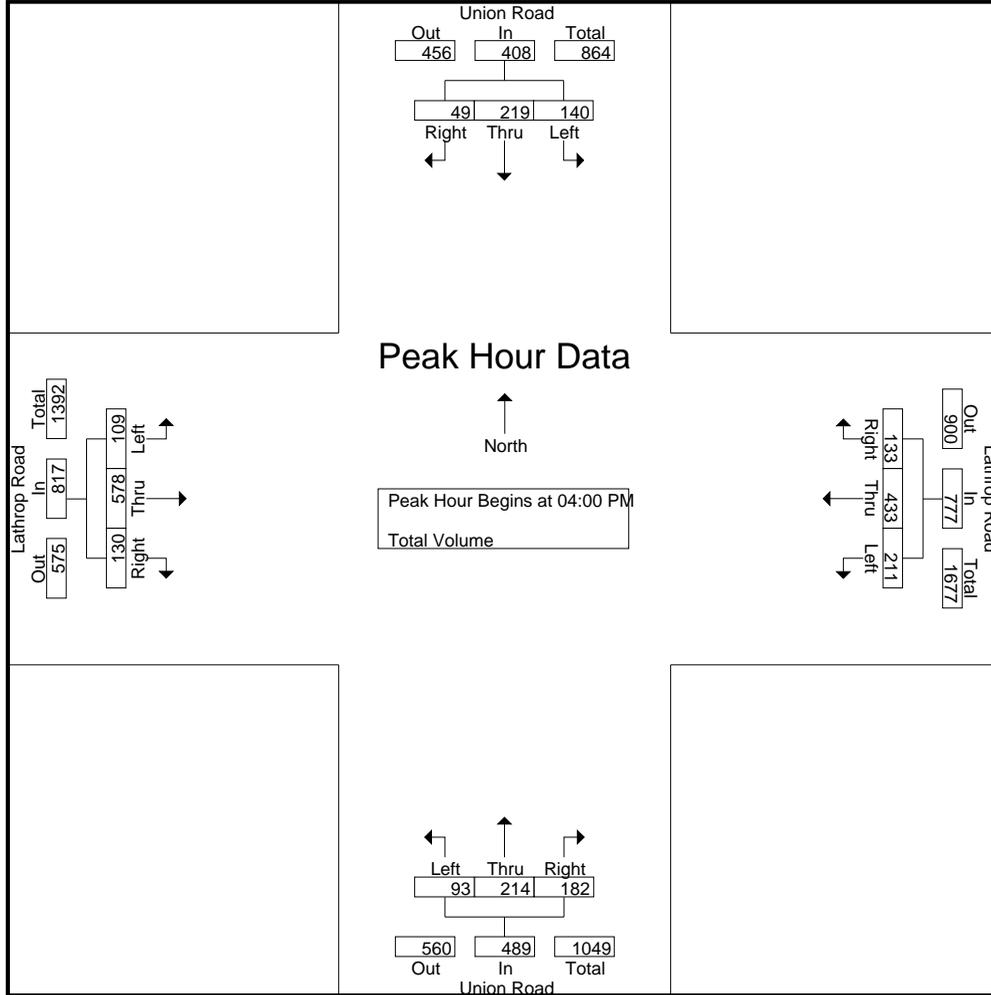
Groups Printed- Total Volume

Start Time	Union Road Southbound				Lathrop Road Westbound				Union Road Northbound				Lathrop Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	48	57	18	123	49	115	38	202	28	65	48	141	29	171	36	236	702
04:15 PM	36	62	11	109	50	104	30	184	27	59	41	127	32	131	27	190	610
04:30 PM	33	50	13	96	57	116	31	204	16	37	41	94	22	148	35	205	599
04:45 PM	23	50	7	80	55	98	34	187	22	53	52	127	26	128	32	186	580
Total	140	219	49	408	211	433	133	777	93	214	182	489	109	578	130	817	2491
05:00 PM	21	54	10	85	60	126	36	222	36	38	46	120	20	140	36	196	623
05:15 PM	28	50	7	85	62	114	24	200	22	43	44	109	21	104	27	152	546
05:30 PM	28	54	15	97	53	113	27	193	18	45	64	127	27	130	37	194	611
05:45 PM	37	55	9	101	51	123	24	198	24	45	36	105	17	154	20	191	595
Total	114	213	41	368	226	476	111	813	100	171	190	461	85	528	120	733	2375
Grand Total	254	432	90	776	437	909	244	1590	193	385	372	950	194	1106	250	1550	4866
Apprch %	32.7	55.7	11.6		27.5	57.2	15.3		20.3	40.5	39.2		12.5	71.4	16.1		
Total %	5.2	8.9	1.8	15.9	9	18.7	5	32.7	4	7.9	7.6	19.5	4	22.7	5.1	31.9	

Start Time	Union Road Southbound				Lathrop Road Westbound				Union Road Northbound				Lathrop Road Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	<b>48</b>	57	<b>18</b>	<b>123</b>	49	115	<b>38</b>	202	<b>28</b>	<b>65</b>	48	<b>141</b>	29	<b>171</b>	<b>36</b>	<b>236</b>	<b>702</b>
04:15 PM	36	<b>62</b>	11	109	50	104	30	184	27	59	41	127	<b>32</b>	131	27	190	610
04:30 PM	33	50	13	96	<b>57</b>	<b>116</b>	31	<b>204</b>	16	37	41	94	22	148	35	205	599
04:45 PM	23	50	7	80	55	98	34	187	22	53	<b>52</b>	127	26	128	32	186	580
Total Volume	140	219	49	408	211	433	133	777	93	214	182	489	109	578	130	817	2491
% App. Total	34.3	53.7	12		27.2	55.7	17.1		19	43.8	37.2		13.3	70.7	15.9		
PHF	.729	.883	.681	.829	.925	.933	.875	.952	.830	.823	.875	.867	.852	.845	.903	.865	.887

City of Manteca  
 N/S: Union Road  
 E/W: Lathrop Road  
 Weather: Clear

File Name : 01\_MTC\_Union\_Lathrop PM  
 Site Code : 231098  
 Start Date : 11/14/2023  
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	04:00 PM				04:30 PM				04:00 PM				04:00 PM			
+0 mins.	<b>48</b>	57	<b>18</b>	<b>123</b>	57	116	31	204	<b>28</b>	<b>65</b>	48	<b>141</b>	29	<b>171</b>	<b>36</b>	<b>236</b>
+15 mins.	36	<b>62</b>	11	109	55	98	34	187	27	59	41	127	<b>32</b>	131	27	190
+30 mins.	33	50	13	96	60	<b>126</b>	<b>36</b>	<b>222</b>	16	37	41	94	22	148	35	205
+45 mins.	23	50	7	80	<b>62</b>	114	24	200	22	53	<b>52</b>	127	26	128	32	186
Total Volume	140	219	49	408	234	454	125	813	93	214	182	489	109	578	130	817
% App. Total	34.3	53.7	12		28.8	55.8	15.4		19	43.8	37.2		13.3	70.7	15.9	
PHF	.729	.883	.681	.829	.944	.901	.868	.916	.830	.823	.875	.867	.852	.845	.903	.865

City of Manteca  
 N/S: Arrowsmith Drive  
 E/W: Lathrop Road  
 Weather: Clear

File Name : 02\_MTC\_Arr\_Lathrop AM  
 Site Code : 231098  
 Start Date : 11/14/2023  
 Page No : 1

Groups Printed- Total Volume

Start Time	Lathrop Road Westbound			Arrowsmith Drive Northbound			Lathrop Road Eastbound			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
07:00 AM	0	131	131	3	2	5	145	0	145	281
07:15 AM	1	163	164	2	6	8	192	2	194	366
07:30 AM	5	221	226	8	2	10	220	4	224	460
07:45 AM	0	230	230	3	2	5	247	8	255	490
Total	6	745	751	16	12	28	804	14	818	1597
08:00 AM	0	157	157	6	5	11	244	6	250	418
08:15 AM	0	170	170	5	3	8	186	5	191	369
08:30 AM	1	136	137	3	1	4	205	3	208	349
08:45 AM	1	126	127	3	1	4	165	2	167	298
Total	2	589	591	17	10	27	800	16	816	1434
Grand Total	8	1334	1342	33	22	55	1604	30	1634	3031
Apprch %	0.6	99.4		60	40		98.2	1.8		
Total %	0.3	44	44.3	1.1	0.7	1.8	52.9	1	53.9	

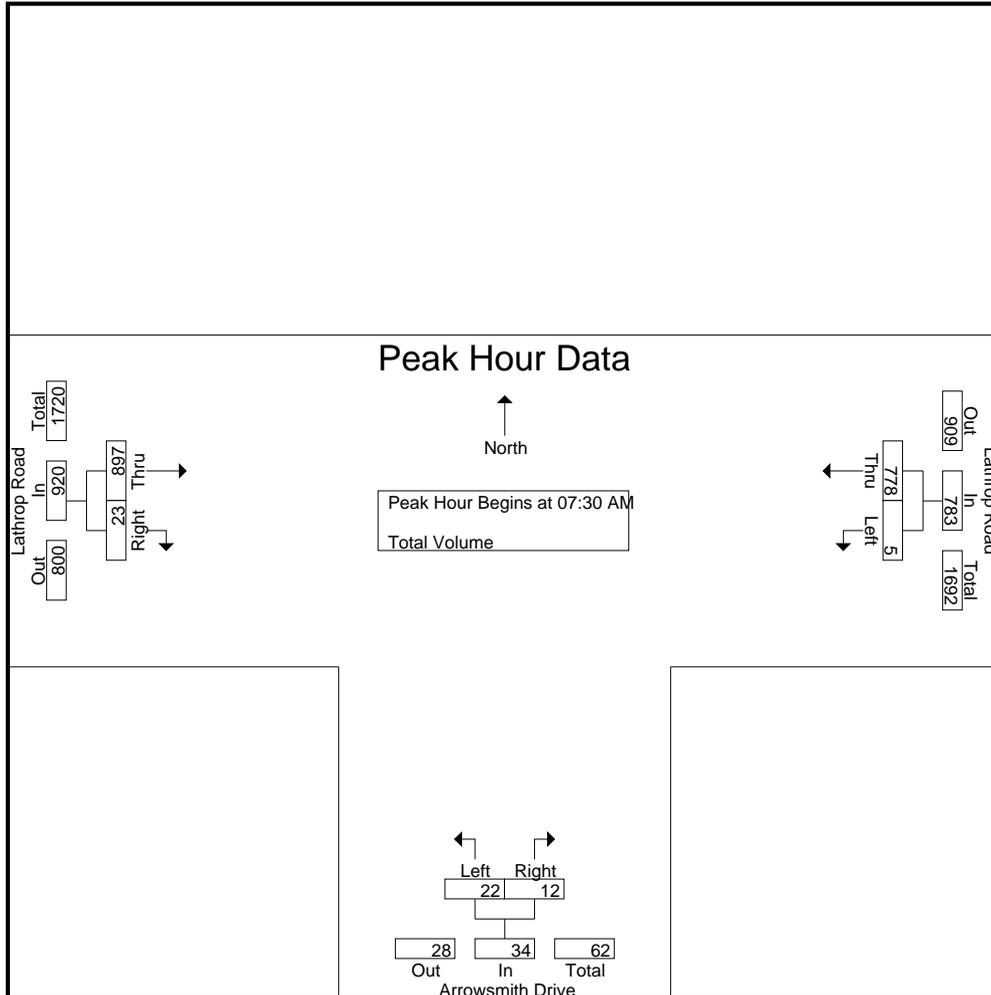
Start Time	Lathrop Road Westbound			Arrowsmith Drive Northbound			Lathrop Road Eastbound			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
07:30 AM	5	221	226	8	2	10	220	4	224	460
07:45 AM	0	230	230	3	2	5	247	8	255	490
08:00 AM	0	157	157	6	5	11	244	6	250	418
08:15 AM	0	170	170	5	3	8	186	5	191	369
Total Volume	5	778	783	22	12	34	897	23	920	1737
% App. Total	0.6	99.4		64.7	35.3		97.5	2.5		
PHF	.250	.846	.851	.688	.600	.773	.908	.719	.902	.886

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

City of Manteca  
 N/S: Arrowsmith Drive  
 E/W: Lathrop Road  
 Weather: Clear

File Name : 02\_MTC\_Arr\_Lathrop AM  
 Site Code : 231098  
 Start Date : 11/14/2023  
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	07:30 AM			07:15 AM			07:15 AM		
+0 mins.	5	221	226	2	6	8	192	2	194
+15 mins.	0	230	230	8	2	10	220	4	224
+30 mins.	0	157	157	3	2	5	247	8	255
+45 mins.	0	170	170	6	5	11	244	6	250
Total Volume	5	778	783	19	15	34	903	20	923
% App. Total	0.6	99.4		55.9	44.1		97.8	2.2	
PHF	.250	.846	.851	.594	.625	.773	.914	.625	.905

City of Manteca  
 N/S: Arrowsmith Drive  
 E/W: Lathrop Road  
 Weather: Clear

File Name : 02\_MTC\_Arr\_Lathrop PM  
 Site Code : 231098  
 Start Date : 11/14/2023  
 Page No : 1

Groups Printed- Total Volume

Start Time	Lathrop Road Westbound			Arrowsmith Drive Northbound			Lathrop Road Eastbound			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
04:00 PM	3	197	200	1	1	2	237	7	244	446
04:15 PM	2	187	189	3	1	4	202	4	206	399
04:30 PM	0	183	183	1	8	9	217	8	225	417
04:45 PM	0	182	182	5	2	7	194	5	199	388
Total	5	749	754	10	12	22	850	24	874	1650
05:00 PM	3	214	217	2	0	2	205	3	208	427
05:15 PM	3	179	182	3	0	3	172	8	180	365
05:30 PM	3	218	221	5	2	7	229	8	237	465
05:45 PM	1	168	169	6	4	10	204	7	211	390
Total	10	779	789	16	6	22	810	26	836	1647
Grand Total	15	1528	1543	26	18	44	1660	50	1710	3297
Apprch %	1	99		59.1	40.9		97.1	2.9		
Total %	0.5	46.3	46.8	0.8	0.5	1.3	50.3	1.5	51.9	

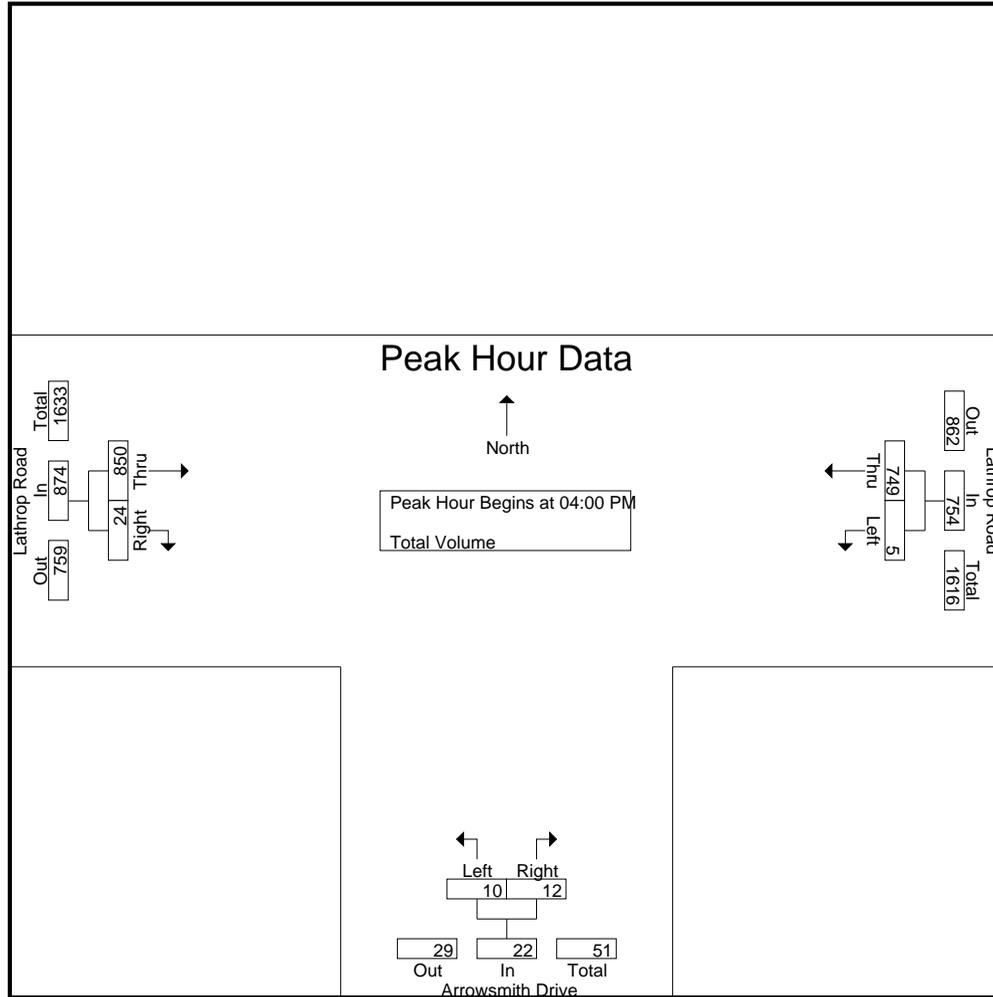
Start Time	Lathrop Road Westbound			Arrowsmith Drive Northbound			Lathrop Road Eastbound			Int. Total
	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	
04:00 PM	<b>3</b>	<b>197</b>	<b>200</b>	1	1	2	<b>237</b>	7	<b>244</b>	<b>446</b>
04:15 PM	2	187	189	3	1	4	202	4	206	399
04:30 PM	0	183	183	1	<b>8</b>	<b>9</b>	217	<b>8</b>	225	417
04:45 PM	0	182	182	<b>5</b>	2	7	194	5	199	388
Total Volume	5	749	754	10	12	22	850	24	874	1650
% App. Total	0.7	99.3		45.5	54.5		97.3	2.7		
PHF	.417	.951	.943	.500	.375	.611	.897	.750	.895	.925

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:00 PM

City of Manteca  
 N/S: Arrowsmith Drive  
 E/W: Lathrop Road  
 Weather: Clear

File Name : 02\_MTC\_Arr\_Lathrop PM  
 Site Code : 231098  
 Start Date : 11/14/2023  
 Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1  
 Peak Hour for Each Approach Begins at:

	04:45 PM			04:00 PM			04:00 PM		
+0 mins.	0	182	182	1	1	2	<b>237</b>	7	<b>244</b>
+15 mins.	3	214	217	3	1	4	202	4	206
+30 mins.	3	179	182	1	8	9	217	8	225
+45 mins.	3	<b>218</b>	<b>221</b>	5	2	7	194	5	199
Total Volume	9	793	802	10	12	22	850	24	874
% App. Total	1.1	98.9		45.5	54.5		97.3	2.7	
PHF	.750	.909	.907	.500	.375	.611	.897	.750	.895

## APPENDIX C

### HCM ANALYSIS WORKSHEETS

EXISTING CONDITION

## Crossroads Plaza

Vistro File: C:\...\SEG23002 Vistro.vistro

Scenario 1 E AM

Report File: C:\...\E AM.pdf

12/14/2023

**Intersection Analysis Summary**

<b>ID</b>	<b>Intersection Name</b>	<b>Control Type</b>	<b>Method</b>	<b>Worst Mvmt</b>	<b>V/C</b>	<b>Delay (s/veh)</b>	<b>LOS</b>
1	N Union Rd/E Lathrop Rd	Signalized	HCM 7th Edition	EB Left	0.671	32.0	C
2	Arrowsmith Dr/E Lathrop Rd	Two-way stop	HCM 7th Edition	NB Left	0.090	19.4	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**  
**Intersection 1: N Union Rd/E Lathrop Rd**

Control Type:	Signalized	Delay (sec / veh):	32.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.671

**Intersection Setup**

Name	North Union Road			North Union Road			East Lathrop Road			East Lathrop Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	North Union Road			North Union Road			East Lathrop Road			East Lathrop Road		
	Base Volume Input [veh/h]	87	207	258	153	232	54	46	501	118	251	422
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	87	207	258	153	232	54	46	501	118	251	422	133
Peak Hour Factor	0.9450	0.9450	0.9450	0.9450	0.9450	0.9450	0.9450	0.9450	0.9450	0.9450	0.9450	0.9450
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	55	68	40	61	14	12	133	31	66	112	35
Total Analysis Volume [veh/h]	92	219	273	162	246	57	49	530	125	266	447	141
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss									
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-									
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	26	0	14	30	0	11	26	0	24	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	21	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No										
Maximum Recall	No	No										
Pedestrian Recall	No	No										
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	33	33	10	37	37	4	16	16	15	28	28
g / C, Green / Cycle	0.07	0.37	0.37	0.11	0.41	0.41	0.04	0.18	0.18	0.17	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.05	0.12	0.17	0.09	0.08	0.08	0.03	0.15	0.08	0.15	0.16	0.16
s, saturation flow rate [veh/h]	1810	1900	1615	1810	1900	1779	1810	3618	1615	1810	1900	1746
c, Capacity [veh/h]	120	692	588	198	774	724	73	648	289	307	586	538
d1, Uniform Delay [s]	41.41	20.59	21.93	39.29	17.25	17.28	42.66	35.59	32.93	36.43	25.71	25.72
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.73	1.20	2.62	8.12	0.58	0.64	9.97	2.61	1.02	7.28	0.72	0.79
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.77	0.32	0.46	0.82	0.20	0.20	0.67	0.82	0.43	0.87	0.52	0.52
d, Delay for Lane Group [s/veh]	51.14	21.79	24.54	47.42	17.83	17.91	52.63	38.20	33.95	43.71	26.43	26.51
Lane Group LOS	D	C	C	D	B	B	D	D	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.31	3.45	4.69	3.90	2.14	2.05	1.27	5.72	2.48	6.21	5.39	4.97
50th-Percentile Queue Length [ft/ln]	57.78	86.13	117.37	97.54	53.45	51.22	31.70	143.01	61.89	155.14	134.68	124.18
95th-Percentile Queue Length [veh/ln]	4.16	6.20	8.25	7.02	3.85	3.69	2.28	9.64	4.46	10.29	9.19	8.62
95th-Percentile Queue Length [ft/ln]	104.00	155.03	206.21	175.57	96.20	92.19	57.06	241.07	111.40	257.27	229.85	215.55

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	51.14	21.79	24.54	47.42	17.86	17.91	52.63	38.20	33.95	43.71	26.46	26.51
Movement LOS	D	C	C	D	B	B	D	D	C	D	C	C
d_A, Approach Delay [s/veh]	27.70			28.17			38.45			31.84		
Approach LOS	C			C			D			C		
d_I, Intersection Delay [s/veh]	32.04											
Intersection LOS	C											
Intersection V/C	0.671											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.49	36.49	36.49	36.49
I_p,int, Pedestrian LOS Score for Intersection	2.540	2.472	2.666	2.656
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	488	577	488	777
d_b, Bicycle Delay [s]	25.73	22.80	25.73	16.84
I_b,int, Bicycle LOS Score for Intersection	2.041	1.943	2.140	2.264
Bicycle LOS	B	A	B	B

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 2: Arrowsmith Dr/E Lathrop Rd**

Control Type:	Two-way stop	Delay (sec / veh):	19.4
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.090

**Intersection Setup**

Name	Arrowsmith Drive		East Lathrop Road		East Lathrop Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

**Volumes**

Name	Arrowsmith Drive		East Lathrop Road		East Lathrop Road	
Base Volume Input [veh/h]	22	12	897	23	5	778
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	12	897	23	5	778
Peak Hour Factor	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	3	253	6	1	220
Total Analysis Volume [veh/h]	25	14	1012	26	6	878
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.09	0.03	0.01	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	19.44	13.55	0.00	0.00	10.32	0.00
Movement LOS	C	B	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.40	0.40	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	9.91	9.91	0.00	0.00	0.25	0.13
d_A, Approach Delay [s/veh]	17.32		0.00		0.07	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.38					
Intersection LOS	C					

## Crossroads Plaza

Vistro File: C:\...\SEG23002 Vistro.vistro

Scenario 2 E PM

Report File: C:\...\E PM.pdf

12/14/2023

**Intersection Analysis Summary**

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	N Union Rd/E Lathrop Rd	Signalized	HCM 7th Edition	NB Left	0.642	33.2	C
2	Arrowsmith Dr/E Lathrop Rd	Two-way stop	HCM 7th Edition	NB Left	0.036	17.2	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**  
**Intersection 1: N Union Rd/E Lathrop Rd**

Control Type:	Signalized	Delay (sec / veh):	33.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.642

**Intersection Setup**

Name	North Union Road			North Union Road			East Lathrop Road			East Lathrop Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↵↵↵			↵↵↵			↵↵↵			↵↵↵		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	North Union Road			North Union Road			East Lathrop Road			East Lathrop Road		
Base Volume Input [veh/h]	93	214	182	140	219	49	109	578	130	211	433	133
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	93	214	182	140	219	49	109	578	130	211	433	133
Peak Hour Factor	0.8870	0.8870	0.8870	0.8870	0.8870	0.8870	0.8870	0.8870	0.8870	0.8870	0.8870	0.8870
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	60	51	39	62	14	31	163	37	59	122	37
Total Analysis Volume [veh/h]	105	241	205	158	247	55	123	652	147	238	488	150
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss									
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-									
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	26	0	17	30	0	21	26	0	21	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	21	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No										
Maximum Recall	No	No										
Pedestrian Recall	No	No										
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	32	32	10	35	35	8	19	19	14	25	25
g / C, Green / Cycle	0.07	0.35	0.35	0.11	0.38	0.38	0.09	0.21	0.21	0.15	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.06	0.13	0.13	0.09	0.08	0.08	0.07	0.18	0.09	0.13	0.17	0.17
s, saturation flow rate [veh/h]	1810	1900	1619	1810	1900	1783	1810	3618	1615	1810	1900	1749
c, Capacity [veh/h]	136	663	565	195	725	681	159	767	342	278	528	486
d1, Uniform Delay [s]	40.94	21.84	21.93	39.31	18.76	18.79	40.27	34.15	30.80	37.20	28.48	28.49
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.89	1.51	1.85	7.73	0.67	0.73	7.88	2.76	0.85	7.50	1.24	1.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.77	0.36	0.37	0.81	0.21	0.22	0.78	0.85	0.43	0.86	0.63	0.63
d, Delay for Lane Group [s/veh]	49.83	23.35	23.78	47.04	19.43	19.52	48.15	36.90	31.65	44.70	29.72	29.84
Lane Group LOS	D	C	C	D	B	B	D	D	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.60	3.91	3.49	3.79	2.25	2.16	2.98	6.99	2.80	5.60	6.29	5.81
50th-Percentile Queue Length [ft/ln]	64.90	97.79	87.20	94.68	56.16	53.92	74.54	174.75	70.10	139.94	157.36	145.33
95th-Percentile Queue Length [veh/ln]	4.67	7.04	6.28	6.82	4.04	3.88	5.37	11.33	5.05	9.48	10.41	9.77
95th-Percentile Queue Length [ft/ln]	116.82	176.02	156.96	170.43	101.10	97.06	134.17	283.15	126.18	236.94	260.22	244.18

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	49.83	23.35	23.78	47.04	19.46	19.52	48.15	36.90	31.65	44.70	29.76	29.84
Movement LOS	D	C	C	D	B	B	D	D	C	D	C	C
d_A, Approach Delay [s/veh]	28.56			28.94			37.57			33.83		
Approach LOS	C			C			D			C		
d_I, Intersection Delay [s/veh]	33.22											
Intersection LOS	C											
Intersection V/C	0.642											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.49	36.49	36.49	36.49
I_p,int, Pedestrian LOS Score for Intersection	2.532	2.491	2.710	2.670
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	488	577	488	488
d_b, Bicycle Delay [s]	25.73	22.80	25.73	25.73
I_b,int, Bicycle LOS Score for Intersection	2.014	1.939	2.320	2.282
Bicycle LOS	B	A	B	B

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 2: Arrowsmith Dr/E Lathrop Rd**

Control Type:	Two-way stop	Delay (sec / veh):	17.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.036

**Intersection Setup**

Name	Arrowsmith Drive		East Lathrop Road		East Lathrop Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

**Volumes**

Name	Arrowsmith Drive		East Lathrop Road		East Lathrop Road	
Base Volume Input [veh/h]	10	12	850	24	5	749
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	12	850	24	5	749
Peak Hour Factor	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	3	230	6	1	202
Total Analysis Volume [veh/h]	11	13	919	26	5	810
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.04	0.02	0.01	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	17.20	12.19	0.00	0.00	9.91	0.00
Movement LOS	C	B	A	A	A	A
95th-Percentile Queue Length [veh/ln]	0.19	0.19	0.00	0.00	0.01	0.00
95th-Percentile Queue Length [ft/ln]	4.72	4.72	0.00	0.00	0.21	0.10
d_A, Approach Delay [s/veh]	14.48		0.00		0.06	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.22					
Intersection LOS	C					

OPENING YEAR PLUS PROJECT

## Crossroads Plaza

Vistro File: C:\...\SEG23002 Vistro.vistro

Scenario 3 OYP AM

Report File: C:\...\OYP AM.pdf

12/14/2023

**Intersection Analysis Summary**

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	N Union Rd/E Lathrop Rd	Signalized	HCM 7th Edition	WB Left	0.884	43.7	D
2	Arrowsmith Dr/E Lathrop Rd	Two-way stop	HCM 7th Edition	NB Left	0.120	24.1	C
3	Driveway #1/E Lathrop Rd	Two-way stop	HCM 7th Edition	NB Right	0.031	13.2	B
4	N Union Rd/Driveway #2	Two-way stop	HCM 7th Edition	WB Right	0.060	11.6	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**  
**Intersection 1: N Union Rd/E Lathrop Rd**

Control Type:	Signalized	Delay (sec / veh):	43.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.884

**Intersection Setup**

Name	North Union Road			North Union Road			East Lathrop Road			East Lathrop Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↵↵↵			↵↵↵			↵↵↵			↵↵↵		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	North Union Road			North Union Road			East Lathrop Road			East Lathrop Road		
	Base Volume Input [veh/h]	87	207	258	153	232	54	46	501	118	251	422
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0527	1.0527	1.0527	1.0527	1.0527	1.0527	1.0527	1.0527	1.0527	1.0527	1.0527	1.0527
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	160	69	31	77	118	56	56	72	98	1	91	35
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	252	287	303	238	362	113	104	599	222	265	535	175
Peak Hour Factor	0.9450	0.9450	0.9450	0.9450	0.9450	0.9450	0.9450	0.9450	0.9450	0.9450	0.9450	0.9450
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	67	76	80	63	96	30	28	158	59	70	142	46
Total Analysis Volume [veh/h]	267	304	321	252	383	120	110	634	235	280	566	185
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss									
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-									
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	22	31	0	21	30	0	12	26	0	22	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	21	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No										
Maximum Recall	No	No										
Pedestrian Recall	No	No										
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	18	28	28	17	27	27	8	21	21	18	31	31
g / C, Green / Cycle	0.18	0.28	0.28	0.17	0.27	0.27	0.08	0.21	0.21	0.18	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.16	0.18	0.22	0.15	0.15	0.15	0.07	0.19	0.16	0.17	0.23	0.23
s, saturation flow rate [veh/h]	1629	1710	1454	1629	1710	1572	1629	3256	1454	1629	1710	1568
c, Capacity [veh/h]	293	474	403	277	457	420	132	692	309	293	534	489
d1, Uniform Delay [s]	40.25	31.83	33.59	40.78	31.75	31.77	45.38	38.54	37.02	40.64	30.73	30.73
k, delay calibration	0.12	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.14	0.25	0.25
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.41	6.54	15.07	11.02	5.14	5.63	12.88	5.34	4.01	18.52	4.45	4.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.91	0.64	0.80	0.91	0.57	0.57	0.84	0.92	0.76	0.95	0.73	0.73
d, Delay for Lane Group [s/veh]	51.66	38.36	48.65	51.80	36.89	37.40	58.25	43.89	41.04	59.15	35.18	35.58
Lane Group LOS	D	D	D	D	D	D	E	D	D	E	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.29	7.23	8.78	6.87	6.06	5.65	3.15	7.99	5.67	8.24	8.90	8.22
50th-Percentile Queue Length [ft/ln]	182.19	180.69	219.52	171.65	151.39	141.21	78.64	199.71	141.68	206.02	222.49	205.38
95th-Percentile Queue Length [veh/ln]	11.72	11.64	13.64	11.16	10.09	9.55	5.66	12.62	9.57	12.95	13.79	12.92
95th-Percentile Queue Length [ft/ln]	292.88	290.91	341.01	279.08	252.29	238.65	141.56	315.60	239.29	323.71	344.81	322.89

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	51.66	38.36	48.65	51.80	37.05	37.40	58.25	43.89	41.04	59.15	35.30	35.58
Movement LOS	D	D	D	D	D	D	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	46.05			42.03			44.82			41.83		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	43.70											
Intersection LOS	D											
Intersection V/C	0.884											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	41.44	41.44	41.44	41.44
I_p,int, Pedestrian LOS Score for Intersection	2.656	2.571	2.773	2.743
Crosswalk LOS	B	B	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	540	520	440	640
d_b, Bicycle Delay [s]	26.68	27.41	30.45	23.15
I_b,int, Bicycle LOS Score for Intersection	2.296	2.182	2.367	2.410
Bicycle LOS	B	B	B	B

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 2: Arrowsmith Dr/E Lathrop Rd**

Control Type:	Two-way stop	Delay (sec / veh):	24.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.120

**Intersection Setup**

Name	Arrowsmith Drive		East Lathrop Road		East Lathrop Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

**Volumes**

Name	Arrowsmith Drive		East Lathrop Road		East Lathrop Road	
Base Volume Input [veh/h]	22	12	897	23	5	778
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0260	1.0260	1.0260	1.0260	1.0260	1.0260
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	160	0	0	127
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	12	1080	24	5	925
Peak Hour Factor	0.8860	0.8860	0.8860	0.8860	0.8860	0.8860
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	3	305	7	1	261
Total Analysis Volume [veh/h]	26	14	1219	27	6	1044
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.12	0.03	0.01	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	24.06	15.74	0.00	0.00	11.37	0.00
Movement LOS	C	C	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.53	0.53	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	13.22	13.22	0.00	0.00	0.25	0.13
d_A, Approach Delay [s/veh]	21.15		0.00		0.06	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.39					
Intersection LOS	C					

**Intersection Level Of Service Report**  
**Intersection 3: Driveway #1/E Lathrop Rd**

Control Type:	Two-way stop	Delay (sec / veh):	13.2
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.031

**Intersection Setup**

Name	Driveway #1		East Lathrop Road		East Lathrop Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	↻		↻		↕	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

**Volumes**

Name	Driveway #1		East Lathrop Road		East Lathrop Road	
Base Volume Input [veh/h]	0	0	920	0	0	806
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	2.00	0.00
Growth Factor	1.0000	1.0260	1.0260	1.0260	1.0000	1.0260
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	14	146	34	0	127
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	14	1090	34	0	954
Peak Hour Factor	1.0000	1.0000	0.9450	1.0000	1.0000	0.8660
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	4	288	9	0	275
Total Analysis Volume [veh/h]	0	14	1153	34	0	1102
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.03	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	13.19	0.00	0.00	0.00	0.00
Movement LOS		B	A	A		A
95th-Percentile Queue Length [veh/ln]	0.00	0.10	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	2.39	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	13.19		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.08					
Intersection LOS	B					

**Intersection Level Of Service Report  
Intersection 4: N Union Rd/Driveway #2**

Control Type:	Two-way stop	Delay (sec / veh):	11.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.060

**Intersection Setup**

Name	North Union Road		North Union Road		Driveway #2	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	⇌		⇌		↶	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	1	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	49.21	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

**Volumes**

Name	North Union Road		North Union Road		Driveway #2	
Base Volume Input [veh/h]	552	0	0	601	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	2.00	0.00	2.00	0.00
Growth Factor	1.0260	1.0260	1.0000	1.0260	1.0000	1.0260
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	227	15	0	217	0	33
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	793	15	0	834	0	33
Peak Hour Factor	0.9450	0.9450	1.0000	0.9450	1.0000	0.9450
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	210	4	0	221	0	9
Total Analysis Volume [veh/h]	839	16	0	883	0	35
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.00	0.06
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	11.59
Movement LOS	A	A		A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.19
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	4.79
d_A, Approach Delay [s/veh]	0.00		0.00		11.59	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.23					
Intersection LOS	B					

## Crossroads Plaza

Vistro File: C:\...\SEG23002 Vistro.vistro

Scenario 4 OYP PM

Report File: C:\...\OYP PM.pdf

12/14/2023

**Intersection Analysis Summary**

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	N Union Rd/E Lathrop Rd	Signalized	HCM 7th Edition	NB Left	0.878	50.3	D
2	Arrowsmith Dr/E Lathrop Rd	Two-way stop	HCM 7th Edition	NB Left	0.046	21.0	C
3	Driveway #1/E Lathrop Rd	Two-way stop	HCM 7th Edition	NB Right	0.033	13.7	B
4	N Union Rd/Driveway #2	Two-way stop	HCM 7th Edition	WB Right	0.061	11.6	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**  
**Intersection 1: N Union Rd/E Lathrop Rd**

Control Type:	Signalized	Delay (sec / veh):	50.3
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.878

**Intersection Setup**

Name	North Union Road			North Union Road			East Lathrop Road			East Lathrop Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	↵↵↵			↵↵↵			↵↵↵			↵↵↵		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	North Union Road			North Union Road			East Lathrop Road			East Lathrop Road		
Base Volume Input [veh/h]	93	214	182	140	219	49	109	578	130	211	433	133
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0527	1.0527	1.0527	1.0527	1.0527	1.0527	1.0527	1.0527	1.0527	1.0527	1.0527	1.0527
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	121	132	31	57	89	55	55	110	152	4	67	78
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	219	357	223	204	320	107	170	718	289	226	523	218
Peak Hour Factor	0.8870	0.8870	0.8870	0.8870	0.8870	0.8870	0.8870	0.8870	0.8870	0.8870	0.8870	0.8870
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	62	101	63	57	90	30	48	202	81	64	147	61
Total Analysis Volume [veh/h]	247	402	251	230	361	121	192	809	326	255	590	246
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss									
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-									
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	24	32	0	22	30	0	24	28	0	28	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	21	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No										
Maximum Recall	No	No										
Pedestrian Recall	No	No										
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	18	29	29	17	28	28	15	29	29	19	33	33
g / C, Green / Cycle	0.17	0.26	0.26	0.16	0.25	0.25	0.14	0.26	0.26	0.17	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.15	0.20	0.20	0.14	0.15	0.15	0.12	0.25	0.22	0.16	0.26	0.26
s, saturation flow rate [veh/h]	1629	1710	1493	1629	1710	1565	1629	3256	1454	1629	1710	1541
c, Capacity [veh/h]	274	449	392	256	430	394	220	849	379	284	512	462
d1, Uniform Delay [s]	44.89	37.59	37.60	45.50	36.11	36.14	46.63	40.00	38.75	44.49	36.31	36.33
k, delay calibration	0.12	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.32	0.14	0.35	0.35
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.99	12.42	14.07	10.84	5.68	6.27	10.18	6.95	15.08	12.30	12.32	13.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.90	0.78	0.78	0.90	0.58	0.59	0.87	0.95	0.86	0.90	0.86	0.86
d, Delay for Lane Group [s/veh]	56.89	50.02	51.67	56.34	41.78	42.42	56.81	46.94	53.83	56.79	48.63	49.92
Lane Group LOS	E	D	D	E	D	D	E	D	D	E	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.48	10.16	9.06	6.90	6.56	6.11	5.75	11.41	9.86	7.73	12.69	11.62
50th-Percentile Queue Length [ft/ln]	186.89	254.00	226.38	172.42	164.00	152.73	143.69	285.35	246.51	193.20	317.27	290.54
95th-Percentile Queue Length [veh/ln]	11.96	15.39	13.99	11.20	10.76	10.16	9.68	16.95	15.01	12.29	18.53	17.21
95th-Percentile Queue Length [ft/ln]	298.99	384.69	349.76	280.09	269.01	254.06	241.98	423.87	375.25	307.18	463.32	430.31

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	56.89	50.24	51.67	56.34	41.98	42.42	56.81	46.94	53.83	56.79	48.96	49.92
Movement LOS	E	D	D	E	D	D	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	52.46			46.69			50.06			51.01		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	50.26											
Intersection LOS	D											
Intersection V/C	0.878											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	46.37	46.37	46.37	46.37
I_p,int, Pedestrian LOS Score for Intersection	2.670	2.614	2.835	2.775
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	509	473	436	509
d_b, Bicycle Delay [s]	30.57	32.08	33.62	30.57
I_b,int, Bicycle LOS Score for Intersection	2.302	2.147	2.654	2.460
Bicycle LOS	B	B	B	B

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 2: Arrowsmith Dr/E Lathrop Rd**

Control Type:	Two-way stop	Delay (sec / veh):	21.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.046

**Intersection Setup**

Name	Arrowsmith Drive		East Lathrop Road		East Lathrop Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

**Volumes**

Name	Arrowsmith Drive		East Lathrop Road		East Lathrop Road	
Base Volume Input [veh/h]	10	12	850	24	5	749
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.0260	1.0260	1.0260	1.0260	1.0260	1.0260
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	180	0	0	148
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	12	1052	25	5	916
Peak Hour Factor	0.9250	0.9250	0.9250	0.9250	0.9250	0.9250
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	3	284	7	1	248
Total Analysis Volume [veh/h]	11	13	1137	27	5	990
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.05	0.03	0.01	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	20.97	13.69	0.00	0.00	10.93	0.00
Movement LOS	C	B	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.24	0.24	0.00	0.00	0.01	0.00
95th-Percentile Queue Length [ft/ln]	5.98	5.98	0.00	0.00	0.21	0.10
d_A, Approach Delay [s/veh]	17.03		0.00		0.05	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.21					
Intersection LOS	C					

**Intersection Level Of Service Report**  
**Intersection 3: Driveway #1/E Lathrop Rd**

Control Type:	Two-way stop	Delay (sec / veh):	13.7
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.033

**Intersection Setup**

Name	Driveway #1		East Lathrop Road		East Lathrop Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration	↻		↻		↕	
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

**Volumes**

Name	Driveway #1		East Lathrop Road		East Lathrop Road	
Base Volume Input [veh/h]	0	0	900	0	0	777
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	2.00	0.00
Growth Factor	1.0260	1.0260	1.0260	1.0260	1.0260	1.0260
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	14	167	30	0	148
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	14	1090	30	0	945
Peak Hour Factor	1.0000	1.0000	0.8870	1.0000	1.0000	0.9250
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	4	307	8	0	255
Total Analysis Volume [veh/h]	0	14	1229	30	0	1022
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.03	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	13.66	0.00	0.00	0.00	0.00
Movement LOS		B	A	A		A
95th-Percentile Queue Length [veh/ln]	0.00	0.10	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	2.52	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	13.66		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.08					
Intersection LOS	B					

**Intersection Level Of Service Report  
Intersection 4: N Union Rd/Driveway #2**

Control Type:	Two-way stop	Delay (sec / veh):	11.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.061

**Intersection Setup**

Name	North Union Road		North Union Road		Driveway #2	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	⇈		⇈		↶	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	1	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	49.21	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

**Volumes**

Name	North Union Road		North Union Road		Driveway #2	
Base Volume Input [veh/h]	489	0	0	560	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	2.00	0.00	2.00	0.00
Growth Factor	1.0260	1.0260	1.0260	1.0260	1.0260	1.0260
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	252	13	0	245	0	31
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	754	13	0	820	0	31
Peak Hour Factor	0.8870	0.8870	1.0000	0.8870	1.0000	0.8870
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	213	4	0	231	0	9
Total Analysis Volume [veh/h]	850	15	0	924	0	35
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.00	0.06
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	11.64
Movement LOS	A	A		A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.19
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	4.83
d_A, Approach Delay [s/veh]	0.00		0.00		11.64	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.22					
Intersection LOS	B					

CUMULATIVE WITHOUT PROJECT

## Crossroads Plaza

Vistro File: C:\...\SEG23002 Vistro.vistro

Scenario 5 EAC AM

Report File: C:\...\EAC AM.pdf

12/14/2023

**Intersection Analysis Summary**

<b>ID</b>	<b>Intersection Name</b>	<b>Control Type</b>	<b>Method</b>	<b>Worst Mvmt</b>	<b>V/C</b>	<b>Delay (s/veh)</b>	<b>LOS</b>
1	N Union Rd/E Lathrop Rd	Signalized	HCM 7th Edition	WB Left	0.960	49.7	D
2	Arrowsmith Dr/E Lathrop Rd	Two-way stop	HCM 7th Edition	NB Left	0.140	26.1	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**  
**Intersection 1: N Union Rd/E Lathrop Rd**

Control Type:	Signalized	Delay (sec / veh):	49.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.960

**Intersection Setup**

Name	North Union Road			North Union Road			East Lathrop Road			East Lathrop Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	North Union Road			North Union Road			East Lathrop Road			East Lathrop Road		
Base Volume Input [veh/h]	87	207	258	153	232	54	46	501	118	251	422	133
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	146	64	2	72	118	56	56	58	98	1	91	35
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	257	329	332	268	415	125	115	700	249	323	632	205
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	64	82	83	67	104	31	29	175	62	81	158	51
Total Analysis Volume [veh/h]	257	329	332	268	415	125	115	700	249	323	632	205
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss									
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-									
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	20	29	0	21	30	0	12	26	0	24	38	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	21	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No										
Maximum Recall	No	No										
Pedestrian Recall	No	No										
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	25	25	17	26	26	8	22	22	20	34	34
g / C, Green / Cycle	0.16	0.25	0.25	0.17	0.26	0.26	0.08	0.22	0.22	0.20	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.16	0.19	0.23	0.16	0.16	0.16	0.07	0.21	0.17	0.20	0.25	0.26
s, saturation flow rate [veh/h]	1629	1710	1454	1629	1710	1576	1629	3256	1454	1629	1710	1569
c, Capacity [veh/h]	261	430	366	277	447	412	131	711	317	326	578	530
d1, Uniform Delay [s]	41.90	34.69	36.31	41.25	32.63	32.65	45.53	38.95	36.90	39.94	29.44	29.47
k, delay calibration	0.11	0.50	0.50	0.12	0.50	0.50	0.11	0.11	0.14	0.20	0.27	0.27
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	22.62	12.18	28.62	19.65	6.52	7.09	16.51	12.58	5.34	29.70	5.00	5.52
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.99	0.76	0.91	0.97	0.63	0.63	0.88	0.99	0.78	0.99	0.75	0.76
d, Delay for Lane Group [s/veh]	64.52	46.87	64.93	60.89	39.15	39.74	62.04	51.54	42.24	69.64	34.43	34.99
Lane Group LOS	E	D	E	E	D	D	E	D	D	E	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.88	8.76	10.62	7.99	6.74	6.29	3.41	9.63	6.12	10.48	9.86	9.16
50th-Percentile Queue Length [ft/ln]	197.02	219.00	265.58	199.63	168.48	157.28	85.15	240.80	153.12	262.06	246.57	228.97
95th-Percentile Queue Length [veh/ln]	12.48	13.61	15.97	12.62	11.00	10.40	6.13	14.72	10.18	15.79	15.01	14.12
95th-Percentile Queue Length [ft/ln]	312.11	340.35	399.22	315.48	274.91	260.11	153.27	368.04	254.58	394.80	375.34	353.04

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	64.52	46.87	64.93	60.89	39.34	39.74	62.04	51.54	42.24	69.64	34.61	34.99
Movement LOS	E	D	E	E	D	D	E	D	D	E	C	C
d_A, Approach Delay [s/veh]	58.34			46.55			50.50			44.43		
Approach LOS	E			D			D			D		
d_I, Intersection Delay [s/veh]	49.73											
Intersection LOS	D											
Intersection V/C	0.960											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	41.42	41.42	41.42	41.42
I_p,int, Pedestrian LOS Score for Intersection	2.678	2.591	2.797	2.786
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	500	520	440	680
d_b, Bicycle Delay [s]	28.14	27.40	30.44	21.80
I_b,int, Bicycle LOS Score for Intersection	2.317	2.226	2.437	2.517
Bicycle LOS	B	B	B	B

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 2: Arrowsmith Dr/E Lathrop Rd**

Control Type:	Two-way stop	Delay (sec / veh):	26.1
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.140

**Intersection Setup**

Name	Arrowsmith Drive		East Lathrop Road		East Lathrop Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

**Volumes**

Name	Arrowsmith Drive		East Lathrop Road		East Lathrop Road	
Base Volume Input [veh/h]	22	12	897	23	5	778
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	132	0	0	127
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	15	1281	29	6	1124
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	4	320	7	2	281
Total Analysis Volume [veh/h]	28	15	1281	29	6	1124
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.14	0.04	0.01	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	26.09	16.83	0.00	0.00	11.74	0.00
Movement LOS	D	C	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.63	0.63	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	15.63	15.63	0.00	0.00	0.25	0.13
d_A, Approach Delay [s/veh]	22.86		0.00		0.06	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.42					
Intersection LOS	D					

## Crossroads Plaza

Vistro File: C:\...\SEG23002 Vistro.vistro

Scenario 6 EAC PM

Report File: C:\...\EAC PM.pdf

12/14/2023

**Intersection Analysis Summary**

<b>ID</b>	<b>Intersection Name</b>	<b>Control Type</b>	<b>Method</b>	<b>Worst Mvmt</b>	<b>V/C</b>	<b>Delay (s/veh)</b>	<b>LOS</b>
1	N Union Rd/E Lathrop Rd	Signalized	HCM 7th Edition	SB Left	0.897	49.8	D
2	Arrowsmith Dr/E Lathrop Rd	Two-way stop	HCM 7th Edition	NB Left	0.062	23.5	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**  
**Intersection 1: N Union Rd/E Lathrop Rd**

Control Type:	Signalized	Delay (sec / veh):	49.8
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.897

**Intersection Setup**

Name	North Union Road			North Union Road			East Lathrop Road			East Lathrop Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	North Union Road			North Union Road			East Lathrop Road			East Lathrop Road		
Base Volume Input [veh/h]	93	214	182	140	219	49	109	578	130	211	433	133
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	108	128	4	53	89	55	55	97	152	4	67	78
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	227	402	237	232	370	118	195	837	319	274	622	248
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	101	59	58	93	30	49	209	80	69	156	62
Total Analysis Volume [veh/h]	227	402	237	232	370	118	195	837	319	274	622	248
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss									
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-									
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	21	30	0	21	30	0	19	32	0	27	40	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	21	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No										
Maximum Recall	No	No										
Pedestrian Recall	No	No										
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	27	27	17	27	27	15	30	30	20	35	35
g / C, Green / Cycle	0.15	0.24	0.24	0.15	0.24	0.24	0.14	0.27	0.27	0.19	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.14	0.20	0.20	0.14	0.15	0.15	0.12	0.26	0.22	0.17	0.27	0.27
s, saturation flow rate [veh/h]	1629	1710	1500	1629	1710	1570	1629	3256	1454	1629	1710	1546
c, Capacity [veh/h]	252	414	363	252	414	380	222	886	396	302	550	497
d1, Uniform Delay [s]	45.69	39.46	39.48	45.85	37.12	37.15	46.68	39.25	37.36	43.92	34.56	34.60
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.30	0.17	0.32	0.32
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.13	16.56	18.61	13.01	6.62	7.28	10.73	6.02	10.14	14.68	9.20	10.27
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.90	0.82	0.82	0.92	0.61	0.62	0.88	0.94	0.81	0.91	0.83	0.83
d, Delay for Lane Group [s/veh]	56.82	56.02	58.09	58.86	43.74	44.44	57.41	45.27	47.50	58.60	43.76	44.86
Lane Group LOS	E	E	E	E	D	D	E	D	D	E	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.83	10.52	9.45	7.12	6.81	6.36	5.87	11.63	9.02	8.49	12.50	11.49
50th-Percentile Queue Length [ft/ln]	170.87	263.08	236.32	178.05	170.19	158.96	146.86	290.86	225.45	212.18	312.47	287.28
95th-Percentile Queue Length [veh/ln]	11.12	15.84	14.49	11.50	11.09	10.49	9.85	17.23	13.94	13.27	18.30	17.05
95th-Percentile Queue Length [ft/ln]	278.06	396.08	362.37	287.47	277.17	262.34	246.23	430.70	348.57	331.63	457.42	426.26

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	56.82	56.34	58.09	58.86	43.96	44.44	57.41	45.27	47.50	58.60	44.06	44.86
Movement LOS	E	E	E	E	D	D	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	56.94			48.84			47.55			47.71		
Approach LOS	E			D			D			D		
d_I, Intersection Delay [s/veh]	49.82											
Intersection LOS	D											
Intersection V/C	0.897											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	46.39	46.39	46.39	46.39
I_p,int, Pedestrian LOS Score for Intersection	2.668	2.616	2.841	2.789
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	473	473	509	654
d_b, Bicycle Delay [s]	32.10	32.10	30.59	24.91
I_b,int, Bicycle LOS Score for Intersection	2.274	2.154	2.674	2.503
Bicycle LOS	B	B	B	B

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 2: Arrowsmith Dr/E Lathrop Rd**

Control Type:	Two-way stop	Delay (sec / veh):	23.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.062

**Intersection Setup**

Name	Arrowsmith Drive		East Lathrop Road		East Lathrop Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

**Volumes**

Name	Arrowsmith Drive		East Lathrop Road		East Lathrop Road	
Base Volume Input [veh/h]	10	12	850	24	5	749
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	153	0	0	148
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	15	1242	31	6	1107
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	4	311	8	2	277
Total Analysis Volume [veh/h]	13	15	1242	31	6	1107
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.06	0.04	0.01	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	23.54	14.81	0.00	0.00	11.52	0.00
Movement LOS	C	B	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.32	0.32	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	8.01	8.01	0.00	0.00	0.25	0.13
d_A, Approach Delay [s/veh]	18.87		0.00		0.06	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.25					
Intersection LOS	C					

CUMULATIVE PLUS PROJECT

## Crossroads Plaza

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Scenario 7 EACP AM

Report File: C:\...\EACP AM.pdf

12/14/2023

**Intersection Analysis Summary**

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	N Union Rd/E Lathrop Rd	Signalized	HCM 7th Edition	NB Right	0.992	53.6	D
2	Arrowsmith Dr/E Lathrop Rd	Two-way stop	HCM 7th Edition	NB Left	0.144	26.9	D
3	Driveway #1/E Lathrop Rd	Two-way stop	HCM 7th Edition	NB Right	0.035	14.4	B
4	N Union Rd/Driveway #2	Two-way stop	HCM 7th Edition	WB Right	0.061	12.1	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**  
**Intersection 1: N Union Rd/E Lathrop Rd**

Control Type:	Signalized	Delay (sec / veh):	53.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.992

**Intersection Setup**

Name	North Union Road			North Union Road			East Lathrop Road			East Lathrop Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	North Union Road			North Union Road			East Lathrop Road			East Lathrop Road		
Base Volume Input [veh/h]	87	207	258	153	232	54	46	501	118	251	422	133
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	160	69	31	77	118	56	56	72	98	1	91	35
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	271	334	361	273	415	125	115	714	249	323	632	205
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	68	84	90	68	104	31	29	179	62	81	158	51
Total Analysis Volume [veh/h]	271	334	361	273	415	125	115	714	249	323	632	205
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss									
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-									
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	20	29	0	21	30	0	12	26	0	24	38	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	21	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No										
Maximum Recall	No	No										
Pedestrian Recall	No	No										
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	25	25	17	26	26	8	22	22	20	34	34
g / C, Green / Cycle	0.16	0.25	0.25	0.17	0.26	0.26	0.08	0.22	0.22	0.20	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.17	0.20	0.25	0.17	0.16	0.16	0.07	0.22	0.17	0.20	0.25	0.26
s, saturation flow rate [veh/h]	1629	1710	1454	1629	1710	1576	1629	3256	1454	1629	1710	1569
c, Capacity [veh/h]	261	430	366	277	447	412	131	711	317	326	578	530
d1, Uniform Delay [s]	42.02	34.82	37.28	41.40	32.63	32.65	45.53	39.12	36.90	39.94	29.44	29.47
k, delay calibration	0.12	0.50	0.50	0.13	0.50	0.50	0.11	0.11	0.14	0.20	0.27	0.27
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	38.39	12.86	43.88	23.94	6.52	7.09	16.51	16.85	5.34	29.70	5.00	5.52
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	1.04	0.78	0.99	0.99	0.63	0.63	0.88	1.00	0.78	0.99	0.75	0.76
d, Delay for Lane Group [s/veh]	80.41	47.68	81.15	65.34	39.16	39.74	62.04	55.97	42.24	69.64	34.43	34.99
Lane Group LOS	F	D	F	E	D	D	E	F	D	E	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	9.13	8.98	13.07	8.46	6.74	6.29	3.41	10.22	6.12	10.48	9.86	9.16
50th-Percentile Queue Length [ft/ln]	228.35	224.48	326.76	211.51	168.49	157.26	85.15	255.38	153.12	262.06	246.57	228.97
95th-Percentile Queue Length [veh/ln]	14.34	13.89	19.00	13.23	11.00	10.40	6.13	15.50	10.18	15.79	15.01	14.12
95th-Percentile Queue Length [ft/ln]	358.58	347.34	474.99	330.77	274.93	260.09	153.27	387.43	254.58	394.80	375.34	353.04

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	80.41	47.68	81.15	65.34	39.35	39.74	62.04	55.97	42.24	69.64	34.61	34.99
Movement LOS	F	D	F	E	D	D	E	F	D	E	C	C
d_A, Approach Delay [s/veh]	69.37			48.13			53.45			44.43		
Approach LOS	E			D			D			D		
d_I, Intersection Delay [s/veh]	53.60											
Intersection LOS	D											
Intersection V/C	0.992											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	41.42	41.42	41.42	41.42
I_p,int, Pedestrian LOS Score for Intersection	2.687	2.593	2.802	2.796
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	500	520	440	680
d_b, Bicycle Delay [s]	28.14	27.40	30.44	21.80
I_b,int, Bicycle LOS Score for Intersection	2.357	2.230	2.449	2.517
Bicycle LOS	B	B	B	B

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 2: Arrowsmith Dr/E Lathrop Rd**

Control Type:	Two-way stop	Delay (sec / veh):	26.9
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.144

**Intersection Setup**

Name	Arrowsmith Drive		East Lathrop Road		East Lathrop Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

**Volumes**

Name	Arrowsmith Drive		East Lathrop Road		East Lathrop Road	
Base Volume Input [veh/h]	22	12	897	23	5	778
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	160	0	0	127
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	15	1309	29	6	1124
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	4	327	7	2	281
Total Analysis Volume [veh/h]	28	15	1309	29	6	1124
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.14	0.04	0.01	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	26.86	17.22	0.00	0.00	11.90	0.00
Movement LOS	D	C	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.65	0.65	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	16.17	16.17	0.00	0.00	0.25	0.13
d_A, Approach Delay [s/veh]	23.50		0.00		0.06	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.43					
Intersection LOS	D					

**Intersection Level Of Service Report  
Intersection 3: Driveway #1/E Lathrop Rd**

Control Type:	Two-way stop	Delay (sec / veh):	14.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.035

**Intersection Setup**

Name	Driveway #1		East Lathrop Road		East Lathrop Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

**Volumes**

Name	Driveway #1		East Lathrop Road		East Lathrop Road	
Base Volume Input [veh/h]	0	0	920	0	0	806
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	2.00	0.00
Growth Factor	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	14	146	34	0	127
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	14	1325	34	0	1159
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	4	331	9	0	290
Total Analysis Volume [veh/h]	0	14	1325	34	0	1159
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.04	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	14.36	0.00	0.00	0.00	0.00
Movement LOS		B	A	A		A
95th-Percentile Queue Length [veh/ln]	0.00	0.11	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	2.72	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	14.36		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.08					
Intersection LOS	B					

**Intersection Level Of Service Report  
Intersection 4: N Union Rd/Driveway #2**

Control Type:	Two-way stop	Delay (sec / veh):	12.1
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.061

**Intersection Setup**

Name	North Union Road		North Union Road		Driveway #2	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	⇈		⇈		↱	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	1	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	49.21	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

**Volumes**

Name	North Union Road		North Union Road		Driveway #2	
Base Volume Input [veh/h]	552	0	0	601	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	2.00	0.00	2.00	0.00
Growth Factor	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	227	15	0	217	0	33
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	934	15	0	987	0	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	234	4	0	247	0	8
Total Analysis Volume [veh/h]	934	15	0	987	0	33
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.00	0.06
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	12.07
Movement LOS	A	A		A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.19
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	4.85
d_A, Approach Delay [s/veh]	0.00		0.00		12.07	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.20					
Intersection LOS	B					

## Crossroads Plaza

Vistro File: C:\...\SEG23002 Vistro.vistro

Scenario 8 EACP PM

Report File: C:\...\EACP PM.pdf

12/14/2023

**Intersection Analysis Summary**

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	N Union Rd/E Lathrop Rd	Signalized	HCM 7th Edition	NB Left	0.917	51.2	D
2	Arrowsmith Dr/E Lathrop Rd	Two-way stop	HCM 7th Edition	NB Left	0.064	24.1	C
3	Driveway #1/E Lathrop Rd	Two-way stop	HCM 7th Edition	NB Right	0.035	14.3	B
4	N Union Rd/Driveway #2	Two-way stop	HCM 7th Edition	WB Right	0.055	11.7	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

**Intersection Level Of Service Report**  
**Intersection 1: N Union Rd/E Lathrop Rd**

Control Type:	Signalized	Delay (sec / veh):	51.2
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.917

**Intersection Setup**

Name	North Union Road			North Union Road			East Lathrop Road			East Lathrop Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

**Volumes**

Name	North Union Road			North Union Road			East Lathrop Road			East Lathrop Road		
Base Volume Input [veh/h]	93	214	182	140	219	49	109	578	130	211	433	133
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	121	132	31	57	89	55	55	110	152	4	67	78
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	240	406	264	236	370	118	195	850	319	274	622	248
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	60	102	66	59	93	30	49	213	80	69	156	62
Total Analysis Volume [veh/h]	240	406	264	236	370	118	195	850	319	274	622	248
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

**Intersection Settings**

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

**Phasing & Timing**

Control Type	Protecte	Permiss	Permiss									
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-									
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	21	30	0	21	30	0	19	35	0	24	40	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	21	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No										
Maximum Recall	No	No										
Pedestrian Recall	No	No										
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Exclusive Pedestrian Phase**

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

**Lane Group Calculations**

Lane Group	L	C	C	L	C	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	27	27	17	27	27	15	30	30	20	36	36
g / C, Green / Cycle	0.15	0.24	0.24	0.15	0.24	0.24	0.14	0.28	0.28	0.18	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.15	0.21	0.21	0.14	0.15	0.15	0.12	0.26	0.22	0.17	0.27	0.27
s, saturation flow rate [veh/h]	1629	1710	1488	1629	1710	1570	1629	3256	1454	1629	1710	1546
c, Capacity [veh/h]	252	413	359	252	413	379	222	900	402	296	551	498
d1, Uniform Delay [s]	46.12	40.07	40.07	45.98	37.19	37.23	46.68	39.01	36.93	44.29	34.48	34.52
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.29	0.17	0.32	0.32
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	17.62	21.09	23.58	14.84	6.69	7.36	10.73	5.96	9.17	16.87	9.08	10.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

**Lane Group Results**

X, volume / capacity	0.95	0.87	0.87	0.94	0.61	0.62	0.88	0.94	0.79	0.92	0.83	0.83
d, Delay for Lane Group [s/veh]	63.73	61.15	63.66	60.82	43.88	44.59	57.41	44.97	46.11	61.15	43.56	44.65
Lane Group LOS	E	E	E	E	D	D	E	D	D	E	D	D
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.70	11.62	10.37	7.38	6.82	6.37	5.87	11.80	8.88	8.68	12.47	11.46
50th-Percentile Queue Length [ft/ln]	192.40	290.62	259.20	184.38	170.52	159.24	146.86	294.95	221.94	216.92	311.74	286.58
95th-Percentile Queue Length [veh/ln]	12.25	17.22	15.65	11.83	11.10	10.51	9.85	17.43	13.76	13.51	18.26	17.02
95th-Percentile Queue Length [ft/ln]	306.14	430.40	391.22	295.73	277.60	262.71	246.23	435.78	344.11	337.70	456.52	425.39

**Movement, Approach, & Intersection Results**

d_M, Delay for Movement [s/veh]	63.73	61.45	63.66	60.82	44.11	44.59	57.41	44.97	46.11	61.15	43.85	44.65
Movement LOS	E	E	E	E	D	D	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	62.69			49.63			47.02			48.17		
Approach LOS	E			D			D			D		
d_I, Intersection Delay [s/veh]	51.24											
Intersection LOS	D											
Intersection V/C	0.917											

**Other Modes**

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft <sup>2</sup> /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	46.39	46.39	46.39	46.39
I_p,int, Pedestrian LOS Score for Intersection	2.676	2.618	2.845	2.797
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	473	473	563	654
d_b, Bicycle Delay [s]	32.10	32.10	28.39	24.91
I_b,int, Bicycle LOS Score for Intersection	2.310	2.157	2.685	2.503
Bicycle LOS	B	B	B	B

**Sequence**

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



**Intersection Level Of Service Report**  
**Intersection 2: Arrowsmith Dr/E Lathrop Rd**

Control Type:	Two-way stop	Delay (sec / veh):	24.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.064

**Intersection Setup**

Name	Arrowsmith Drive		East Lathrop Road		East Lathrop Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

**Volumes**

Name	Arrowsmith Drive		East Lathrop Road		East Lathrop Road	
Base Volume Input [veh/h]	10	12	850	24	5	749
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	0.00	0.00
Growth Factor	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	180	0	0	148
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	15	1269	31	6	1107
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	4	317	8	2	277
Total Analysis Volume [veh/h]	13	15	1269	31	6	1107
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	Yes		
Number of Storage Spaces in Median	2	0	2

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.06	0.04	0.01	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	24.14	15.06	0.00	0.00	11.68	0.00
Movement LOS	C	C	A	A	B	A
95th-Percentile Queue Length [veh/ln]	0.33	0.33	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft/ln]	8.25	8.25	0.00	0.00	0.25	0.13
d_A, Approach Delay [s/veh]	19.28		0.00		0.06	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	0.25					
Intersection LOS	C					

**Intersection Level Of Service Report  
Intersection 3: Driveway #1/E Lathrop Rd**

Control Type:	Two-way stop	Delay (sec / veh):	14.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.035

**Intersection Setup**

Name	Driveway #1		East Lathrop Road		East Lathrop Road	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	1
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

**Volumes**

Name	Driveway #1		East Lathrop Road		East Lathrop Road	
Base Volume Input [veh/h]	0	0	900	0	0	777
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	0.00	2.00	0.00
Growth Factor	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	14	167	30	0	148
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	14	1320	30	0	1143
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	4	330	8	0	286
Total Analysis Volume [veh/h]	0	14	1320	30	0	1143
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Stop	Free	Free
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.00	0.03	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	14.30	0.00	0.00	0.00	0.00
Movement LOS		B	A	A		A
95th-Percentile Queue Length [veh/ln]	0.00	0.11	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.00	2.71	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	14.30		0.00		0.00	
Approach LOS	B		A		A	
d_I, Intersection Delay [s/veh]	0.08					
Intersection LOS	B					

**Intersection Level Of Service Report  
Intersection 4: N Union Rd/Driveway #2**

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.055

**Intersection Setup**

Name	North Union Road		North Union Road		Driveway #2	
Approach	Northbound		Southbound		Westbound	
Lane Configuration	<b>↑↑</b>		<b>↑↑</b>		<b>↖</b>	
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	1	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	49.21	0.00	0.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

**Volumes**

Name	North Union Road		North Union Road		Driveway #2	
Base Volume Input [veh/h]	489	0	0	560	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	2.00	0.00	2.00	0.00
Growth Factor	1.2810	1.2810	1.2810	1.2810	1.2810	1.2810
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	252	13	0	245	0	31
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	878	13	0	962	0	31
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	220	3	0	241	0	8
Total Analysis Volume [veh/h]	878	13	0	962	0	31
Pedestrian Volume [ped/h]	0		0		0	

**Intersection Settings**

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

**Movement, Approach, & Intersection Results**

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.01	0.00	0.05
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	11.73
Movement LOS	A	A		A		B
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.00	0.17
95th-Percentile Queue Length [ft/ln]	0.00	0.00	0.00	0.00	0.00	4.34
d_A, Approach Delay [s/veh]	0.00		0.00		11.73	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.19					
Intersection LOS	B					