

LEVEL OF SERVICE ASSESSMENT

Proposed 92-Unit Apartment Complex
Northeast Corner of Third Avenue and Willow Street
In the City of Hesperia

Date: February 8, 2024

Prepared For:

Ouhnar LLC

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Prepared By:

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TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	2
INTRODUCTION.....	3
STUDY SCENARIOS92	6
EXISTING CONDITIONS	8
TRIP GENERATION	11
TRIP DISTRIBUTION.....	12
TRAFFIC ASSIGNMENT	12
EXISTING CONDITIONS PLUS PROJECT	15
OPENING YEAR WITHOUT PROJECT.....	17
OPENING YEAR PLUS PROJECT	19
SIGNIFICANT IMPACT AND MITIGATION.....	21

LIST OF EXHIBITS

Exhibit 1. Vicinity Map	4
Exhibit 2. Site Plan	5
Exhibit 3. Conceptual Striping	6
Exhibit 4. Existing Lane Configurations and Traffic Volumes	10
Exhibit 5. Trip Distribution	13
Exhibit 6. Traffic Assignment	14
Exhibit 7. Existing plus Project Traffic Volumes	16
Exhibit 8. Opening Year without Project Traffic Volumes	18
Exhibit 9. Opening Year plus Project Traffic Volumes	20

LIST OF TABLES

Table 1. Existing Conditions Analysis	9
Table 2. Trip Generation Rate	11
Table 3. Project Trip Generation	11
Table 4. Existing Conditions plus Project	15
Table 5. Opening Year (2025) without Projects	17
Table 6. Opening Year (2025) plus Project	19
Table 7. Project Impact Analysis with Mitigation Measures	21
Table 8. Queue Analysis - After Project Completion	22

Level of Service Assessment

Proposed 96-Unit Apartment Complex

Northeast Corner of Third Avenue and Willow Street in the City of Hesperia



Prepared under the supervision of

A handwritten signature in black ink, appearing to read "Jende Kay Hsu", written over a horizontal line.

Jende Kay Hsu, P.E., T. E.

Lic. # T2285

EXECUTIVE SUMMARY

The purpose of this assessment is to evaluate the traffic impact of the proposed multi-family residence located at the northeast corner of Willow Street and Third Avenue in the City of Hesperia. The proposed development includes constructing 96-unit apartment complex on vacant and unimproved land parcels (APN# 007-02-03). The project includes the following street widening scope:

1. Widen the north half of Willow Street to provide 40 feet width from the center line to the right of way, including 20 feet from center line to curb face.
2. Widen the east half of Third Avenue to provide 50 feet width from the center line to the right of way, including 36 feet from center line to curb face.

The project is expected to produce 51 trips in the AM peak hour, including 12 inbound trips and 39 outbound trips, 60 trips in the PM peak hour, including 38 inbound trips and 22 outbound trips, and 665 daily trips.

The study has recommended the following mitigation measures:

- **Modify striping and traffic signal of the westbound approach on Main Street at Third Avenue to provide one exclusive left-turn lane of 160 feet queuing length and three through lanes.**
- **Modify striping and traffic signal of the eastbound approach on Main Street at Third Avenue to provide one exclusive left-turn lane of 240 feet queuing length and two through lanes.**

With the proposed mitigation measures, the study intersections are expected to operate at acceptable LOS D or better. In addition, the proposed extension of the westbound left-turn queuing length from 145 feet to 160 feet on Main Street at Third Avenue ensures that the expected 95th percentile queue should be effectively accommodated by the striped left-turn pocket and its transitional space. The project is expected to have no or less than significant traffic impact.

INTRODUCTION

The purpose of this assessment is to evaluate the traffic impact of the proposed multi-family residence located at the northeast corner of Willow Street and Third Avenue in the City of Hesperia. The vicinity map is shown in **Exhibit 1**.

The proposed development includes constructing 96-unit apartment complex on vacant and unimproved land parcels (APN# 007-02-03). The site provides one entrance driveway each on Third Avenue and Willow Street. The project includes the following street widening scope:

1. Widen the north half of Willow Street to provide 40 feet width from the center line to the right of way, including 20 feet from center line to curb face.
2. Widen the east half of Third Avenue to provide 50 feet width from the center line to the right of way, including 36 feet from center line to curb face.

Site plan is provided in **Exhibit 2**. The conceptual striping is illustrated in **Exhibit 3**.

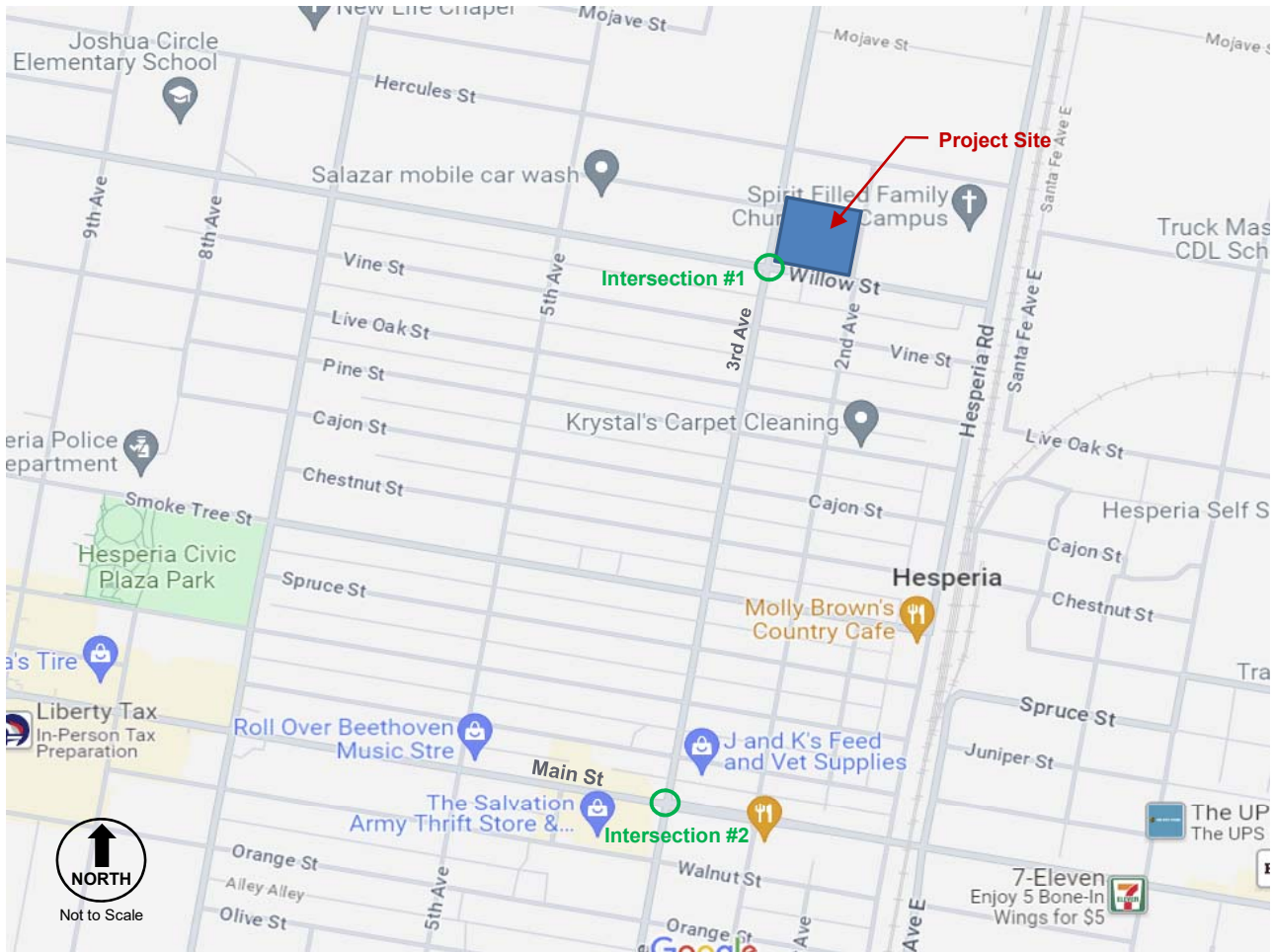


EXHIBIT 1. VICINITY MAP

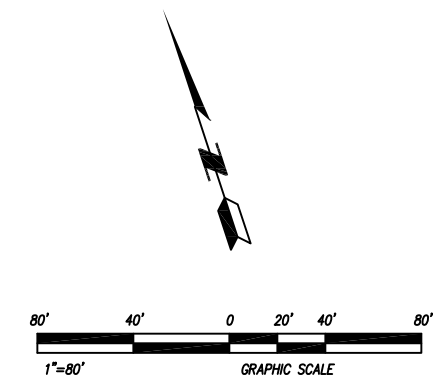
No Scale



NOTE: THIS DRAWING IS NOT A SURVEY. IT IS INTENDED TO BE USED TO LOCATE A STRUCTURE WITHIN LEGAL SETBACKS ONLY. VERIFY ALL LOCATIONS, DIMENSIONS & SETBACKS WITH CIVIL DRAWINGS IF APPLICABLE PRIOR TO COMMENCING CONSTRUCTION.

SCALE: 1" = 30'-0"

[illegible][illegible]



PLOT: 2/6/2024
PREPARED BY:
K2 TRAFFIC ENGINEERING, INC.

STUDY SCENARIOS

In compliance with the City of Hesperia Traffic Impact Analysis Guidelines for Vehicle Miles Traveled (VMT) and Level of Service Assessment (LOS), dated July, 2020, the following scenarios are included in this assessment:

- i. Existing Conditions
- ii. Existing Conditions plus Project
- iii. Project Completion Year (2025) without Project
- iv. Project Completion Year (2025) plus Project

According to the City approved scoping agreement, as provided in **Appendix A**, the following intersections are studied for level of service analysis to evaluate potential traffic impacts:

1. Third Avenue at Willow Street
2. Third Avenue at Main Street

The Level of Service (LOS) Analysis is performed using SYNCHRO software based on the methodologies prescribed in the Highway Capacity Manual (HCM). For signalized intersections the average control delay per vehicle is estimated for each lane group and aggregated for each approach and for the intersection as a whole.

EXISTING CONDITIONS

The project site is located on the northeast corner of Third Avenue and Willow Street. Third Avenue is an undivided north-southerly roadway providing one lane in each direction. Traffic Circulation Plan in Hesperia General Plan 2010 indicates that Third Avenue is classified as “Special Street” between Willow Street and Main Street, “Arterial” north of Willow Street, and “Rural Collector” south of Main Street. The posted speed limit is 45 mph in the project vicinity.

Willow Street is an undivided east-westerly roadway providing one lane in each direction. Willow Street is classified as “Special Street” in the project vicinity. The speed limits are 25 mph. The intersection of Main Street and Third Avenue is controlled by a STOP sign in each approach.

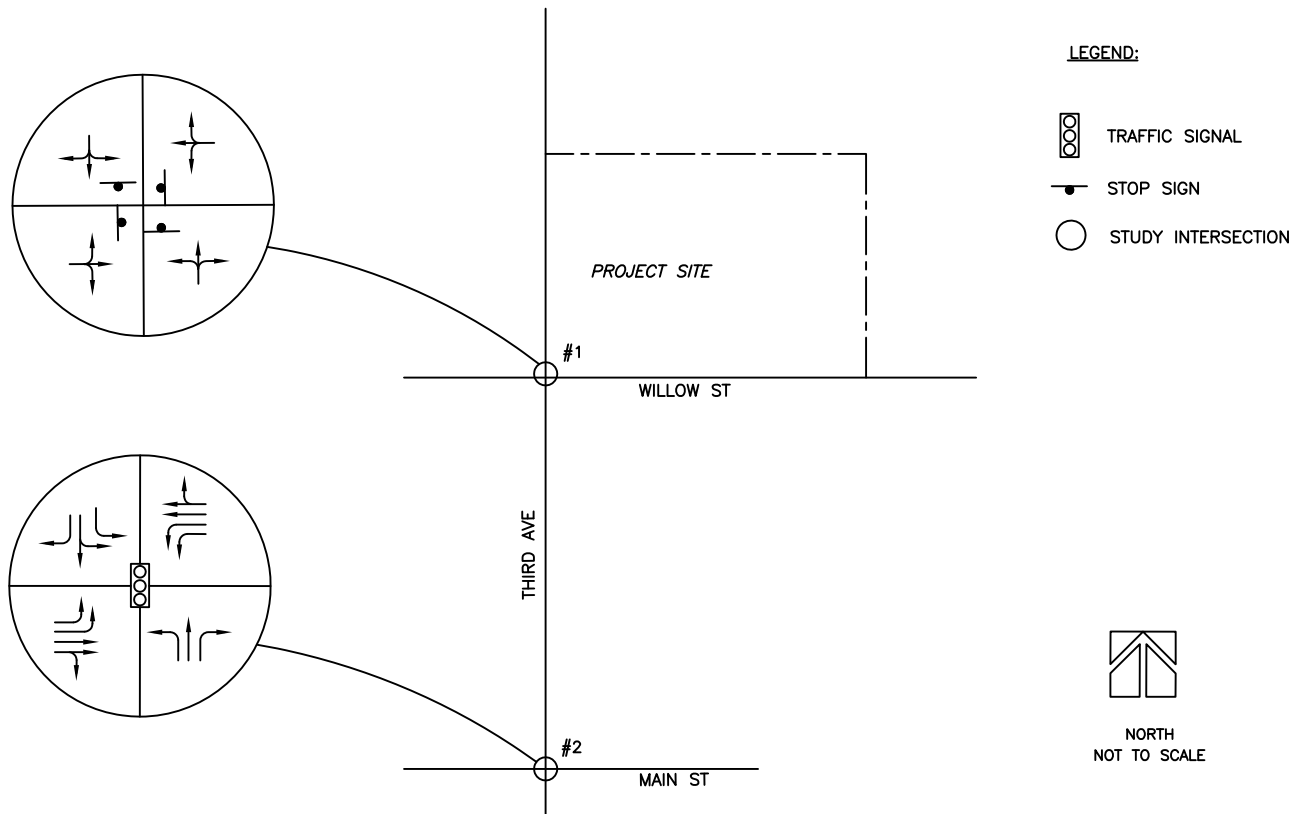
Main Street is an undivided east-westerly roadway with two lanes in each direction and left-turn lanes at major intersection. Main Street is classified as “Special Street” in General Plan 2010. The posted speed limit is 35 mph near Third Avenue. The intersection of Main Street and Third Avenue is controlled by traffic signals.

Turning movement counts in the AM and PM peak hour were collected on January 9, 2024. The existing lane configuration and traffic volumes at the study intersections are shown in **Exhibit 4**. Complete traffic count data can be found in **Appendix B**.

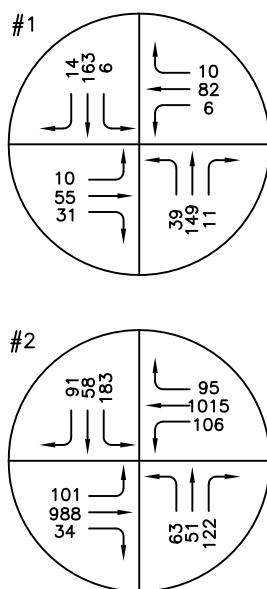
The LOS and overall delay for existing conditions are shown in **Table 1**. The study intersections operate at LOS D or better in both the AM and PM peak hours under existing conditions. The analysis worksheets are provided in **Appendix C**.

Table 1. Existing Conditions Analysis

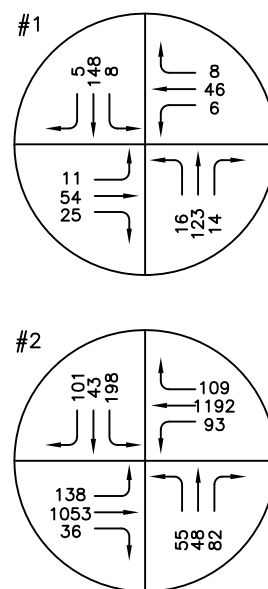
Intersection	Control	AM Peak Hour		PM Peak Hour	
		LOS	Delay (sec)	LOS	Delay (sec)
1. Third Ave at Willow St	Traffic Signal	A	9.3	A	8.6
2. Third Ave at Main St	All-Way Stop	D	54.4	D	47.6



AM PEAK HOUR



PM PEAK HOUR



**EXISTING LANE CONFIGURATIONS
AND TRAFFIC VOLUMES**

Proposed 92-Unit Apartment Complex
NEC of Third Ave and Willow St, Hesperia

TRIP GENERATION

Trip generation represents the amount of traffic attracted and produced by the project development. Based upon the recommendations from “*Trip Generation, 11th Edition*,” published by the Institute of Transportation Engineers (ITE), applicable trip generation rates are shown in **Table 2**.

Table 2. Trip Generation Rate

Multifamily Housing (Low-Rise) (220)			
Time Period	Fitted Curve Equation	IN	OUT
AM Peak Hour	$T=0.31(X) + 22.85$	24%	76%
PM Peak Hour	$T=0.43(X) + 20.55$	63%	37%
Daily	$T=6.41(X) + 75.31$	50%	50%

Project trip generation is calculated and summarized in **Table 3**. The project is expected to produce 51 trips in the AM peak hour, including 12 inbound trips and 39 outbound trips, 60 trips in the PM peak hour, including 38 inbound trips and 22 outbound trips, and 665 daily trips.

Table 3. Project Trip Generation

Multifamily Housing (Low-Rise) (220)				
Time Period	Dwelling Unit	IN	OUT	TOTAL
AM Peak Hour	92	12	39	51
PM Peak Hour		38	22	60
Daily		333	333	665

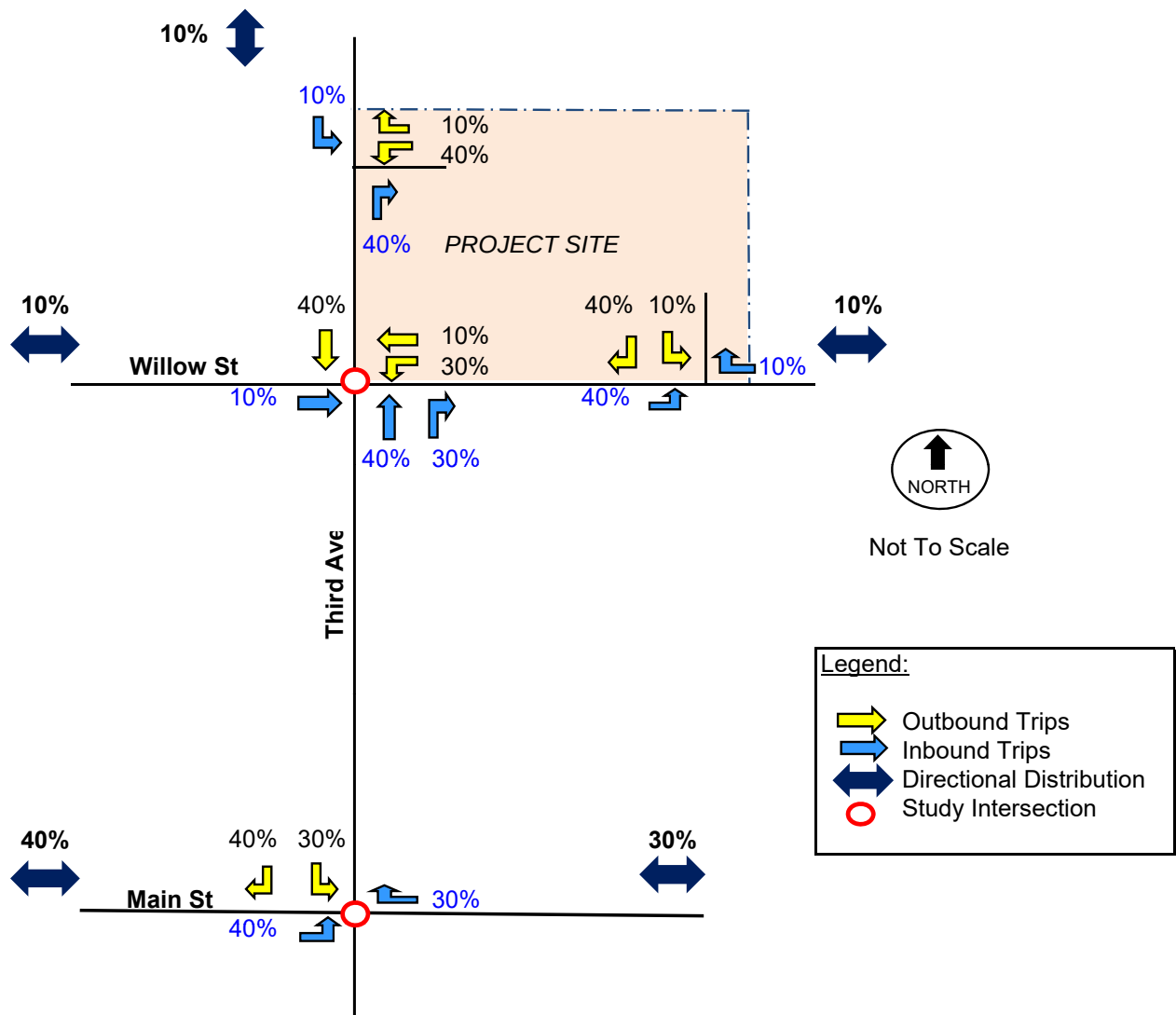
TRIP DISTRIBUTION

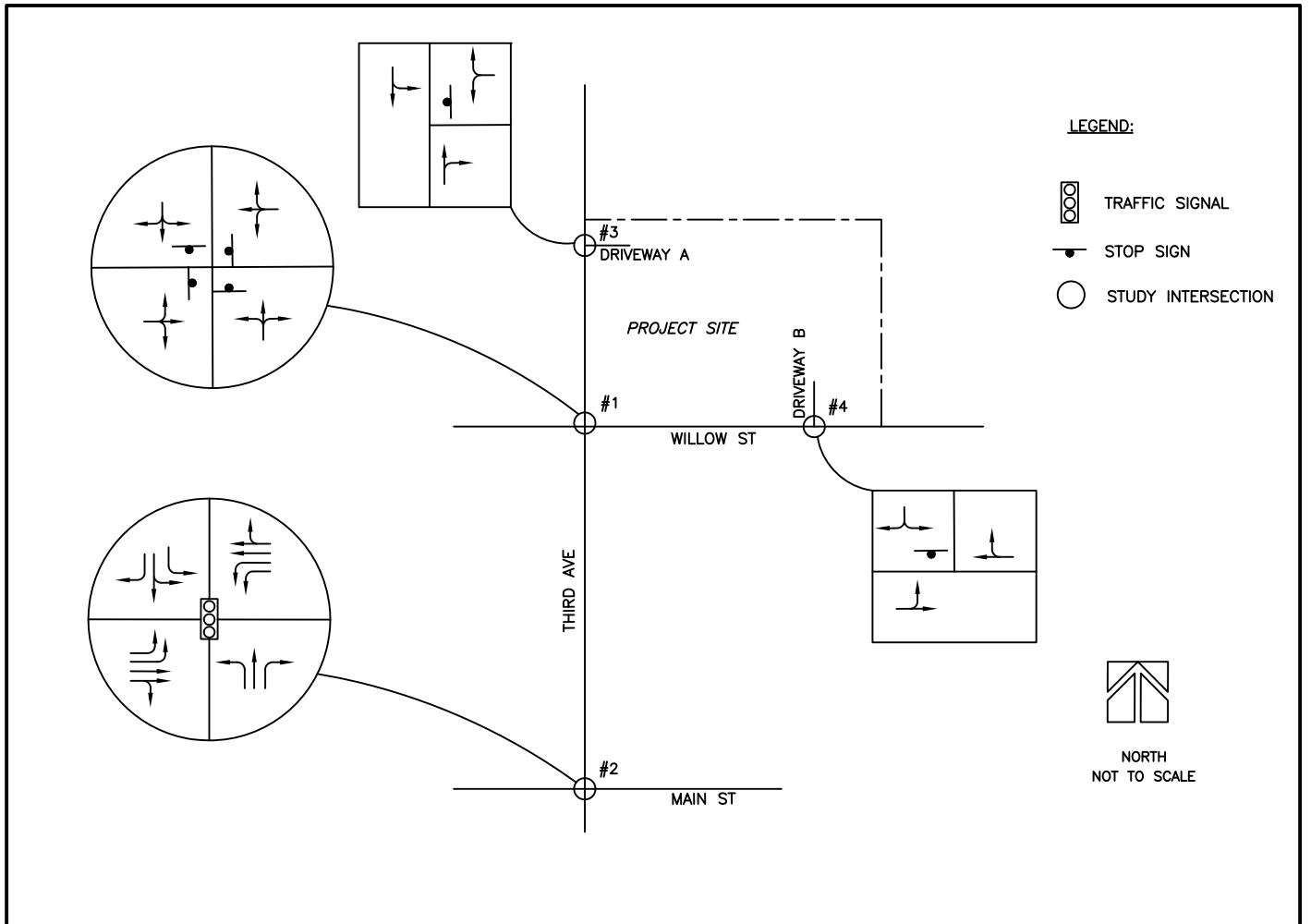
Trip distribution represents the directional orientation of traffic to and from the proposed project. Directional orientation is largely influenced by the geographical location of the site, among many other factors. The trip distribution pattern for the project is illustrated in **Exhibit 5**.

TRAFFIC ASSIGNMENT

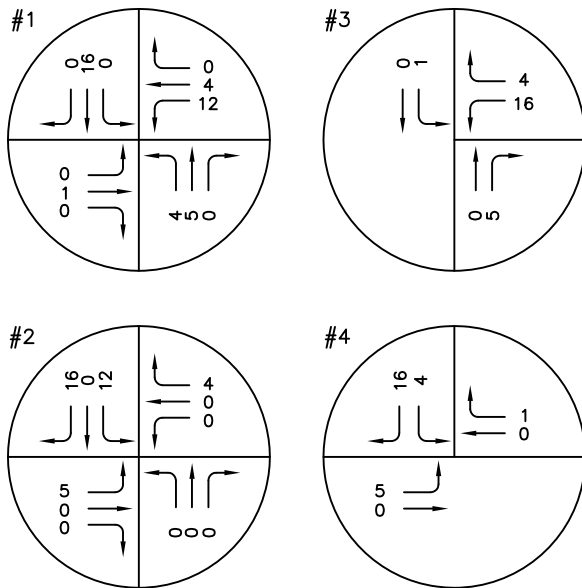
The traffic assignment to and from the site has been based upon the results of trip generation, trip distribution, and access layouts. **Exhibit 6** illustrates the traffic assignment of the proposed project in the AM and PM peak hour.

EXHIBIT 5. TRIP DISTRIBUTION

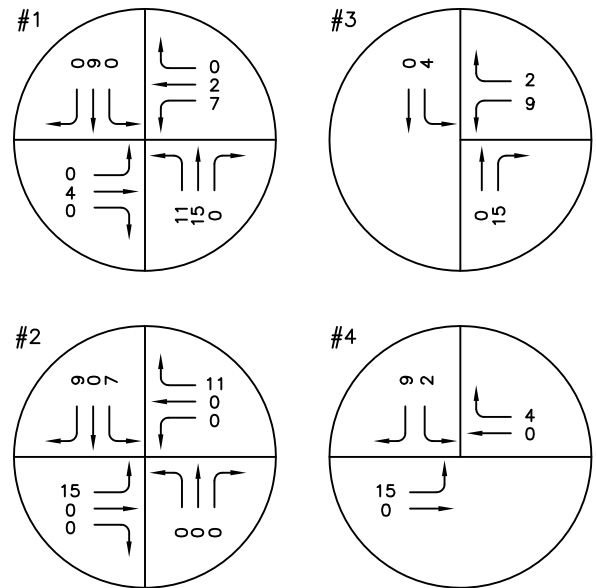




AM PEAK HOUR



PM PEAK HOUR

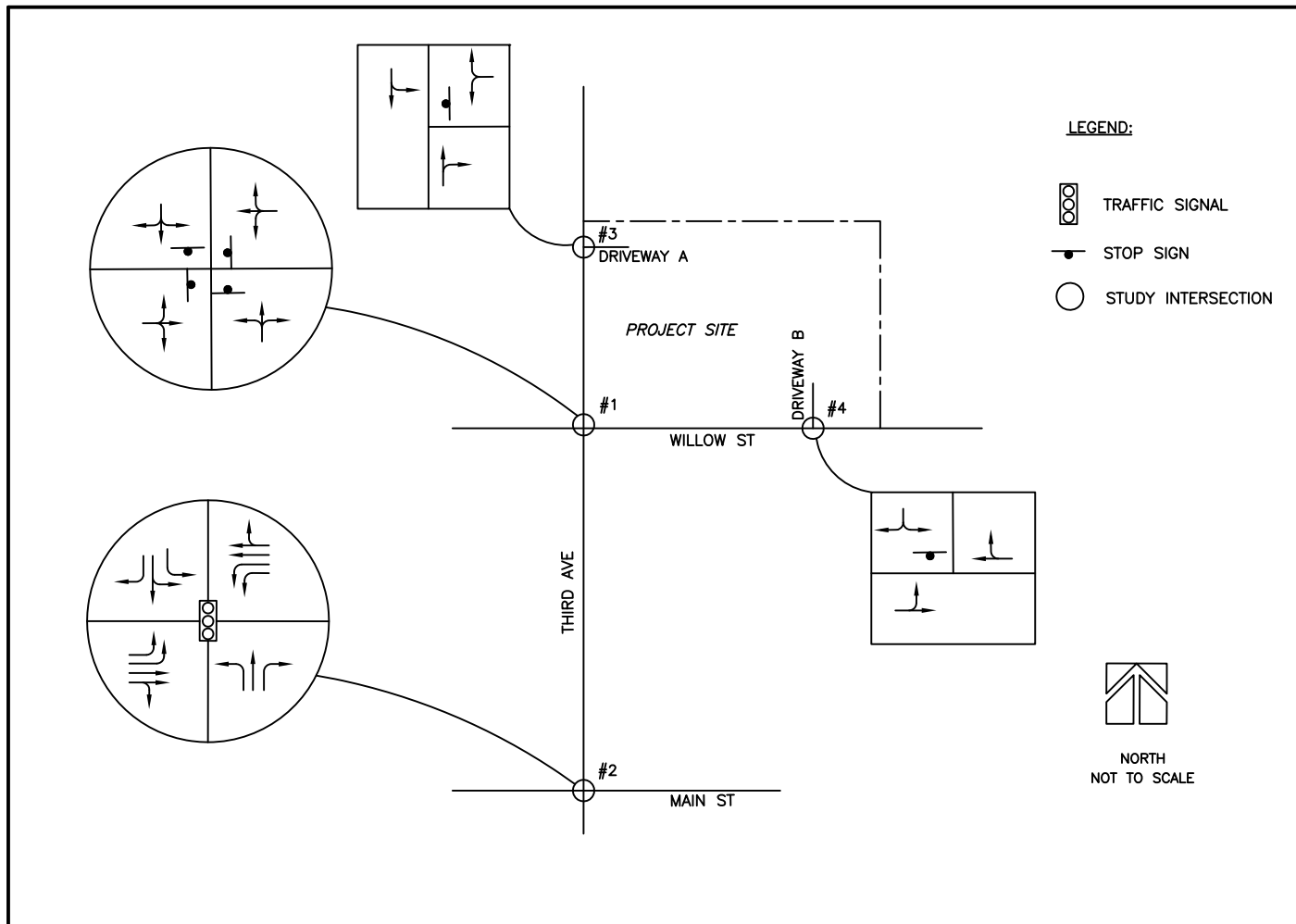


EXISTING CONDITIONS PLUS PROJECT

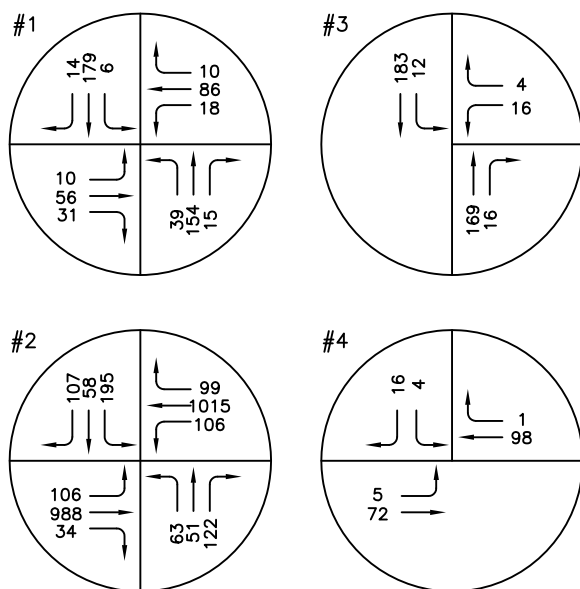
Traffic volumes at the study intersections for existing conditions plus project are shown in **Exhibit 7**. The level of service and delays are shown in **Table 4**. All study intersections will remain operating at LOS D or better for the AM and PM peak hours in this scenario. The analysis worksheets can be found in **Appendix C**.

Table 4. Existing Conditions plus Project

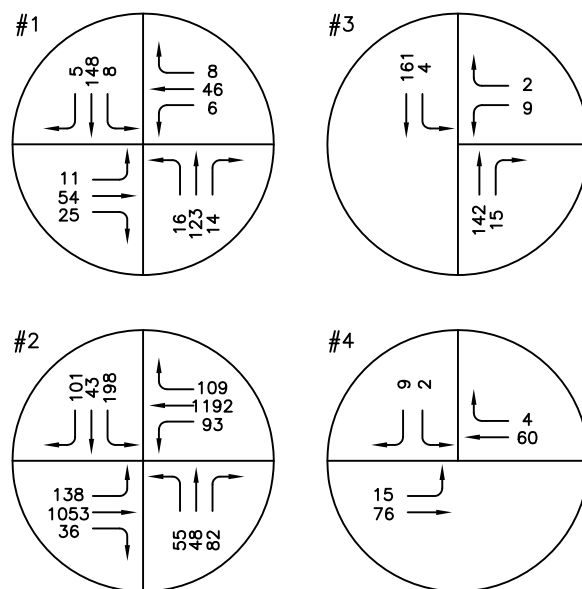
Intersection	Control	AM Peak Hour		PM Peak Hour	
		LOS	Delay (sec)	LOS	Delay (sec)
1. Third Ave at Willow St	Traffic Signal	A	9.6	A	8.9
2. Third Ave at Main St	All-Way Stop	D	54.8	D	52.1
3. Driveway A at Third Ave	Driveway Stop	B	10.7	B	10.4
4. Driveway B at Willow St	Driveway Stop	A	9.1	A	8.8



AM PEAK HOUR



PM PEAK HOUR



EXISTING PLUS PROJECT TRAFFIC VOLUMES

Proposed 92-Unit Apartment Complex
NEC of Third Ave and Willow St, Hesperia

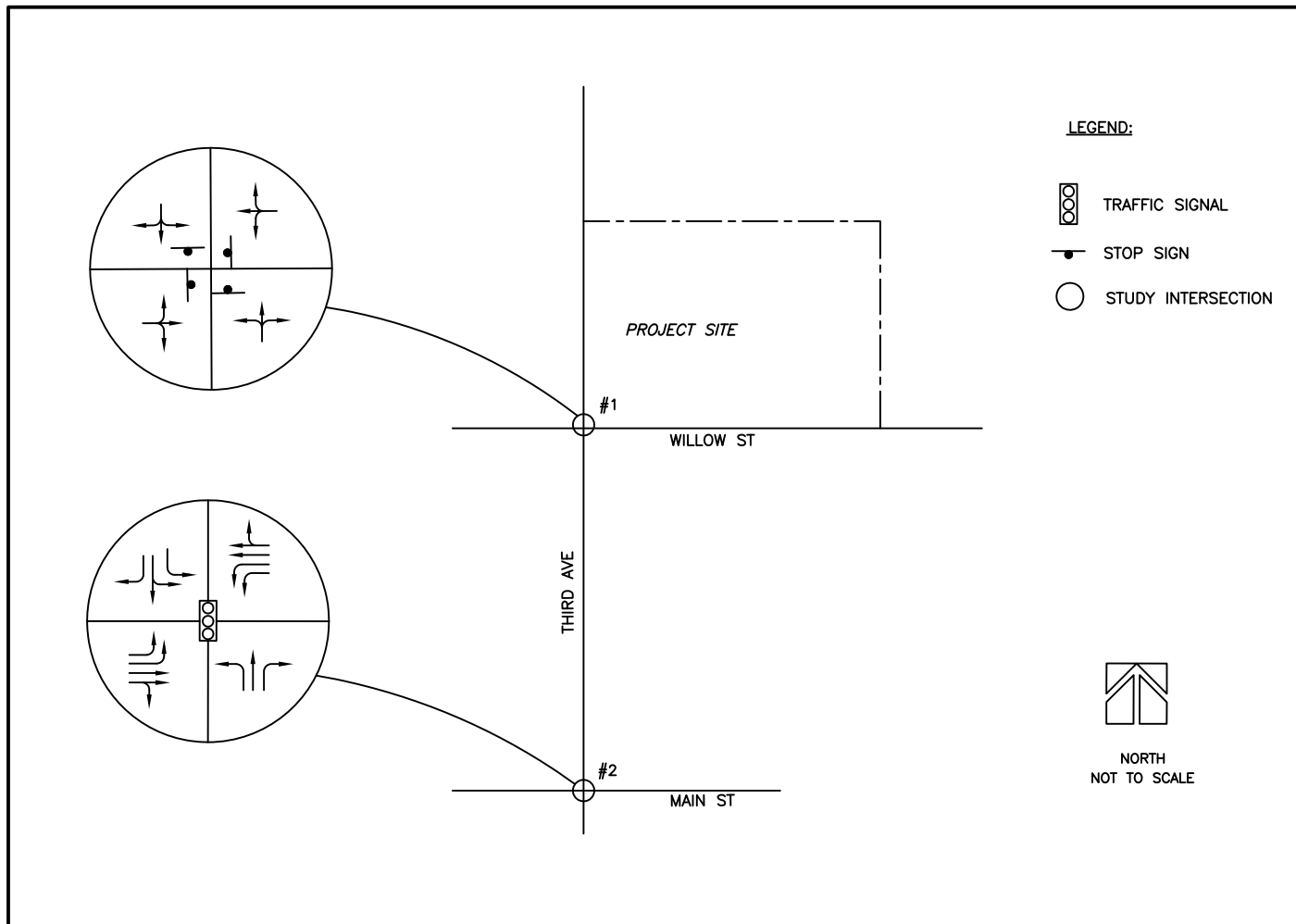
OPENING YEAR WITHOUT PROJECT

For the opening year 2025, the annual ambient growth rate of one and a half percent (1.5%) is used. This factor represents traffic increases resulting from regional growth. Traffic volumes for the opening year without project are illustrated in **Exhibit 8**.

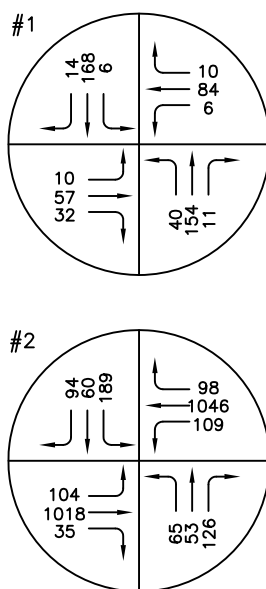
The level of service in the AM and PM peak hour for this scenario are shown in **Table 5**. All study intersections maintain LOS D or better in this scenario. The analysis worksheets can be found in **Appendix C**.

Table 5. Opening Year (2025) without Projects

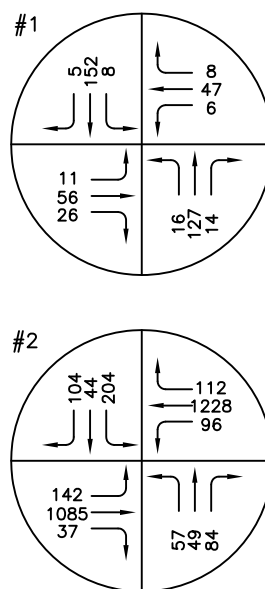
Intersection	Control	AM Peak Hour		PM Peak Hour	
		LOS	Delay (sec)	LOS	Delay (sec)
1. Third Ave at Willow St	Traffic Signal	A	9.4	A	8.7
2. Third Ave at Main St	All-Way Stop	D	54.4	D	51.7



AM PEAK HOUR



PM PEAK HOUR



OPENING YEAR WITHOUT PROJECT TRAFFIC VOLUMES

Proposed 92-Unit Apartment Complex
NEC of Third Ave and Willow St, Hesperia

OPENING YEAR PLUS PROJECT

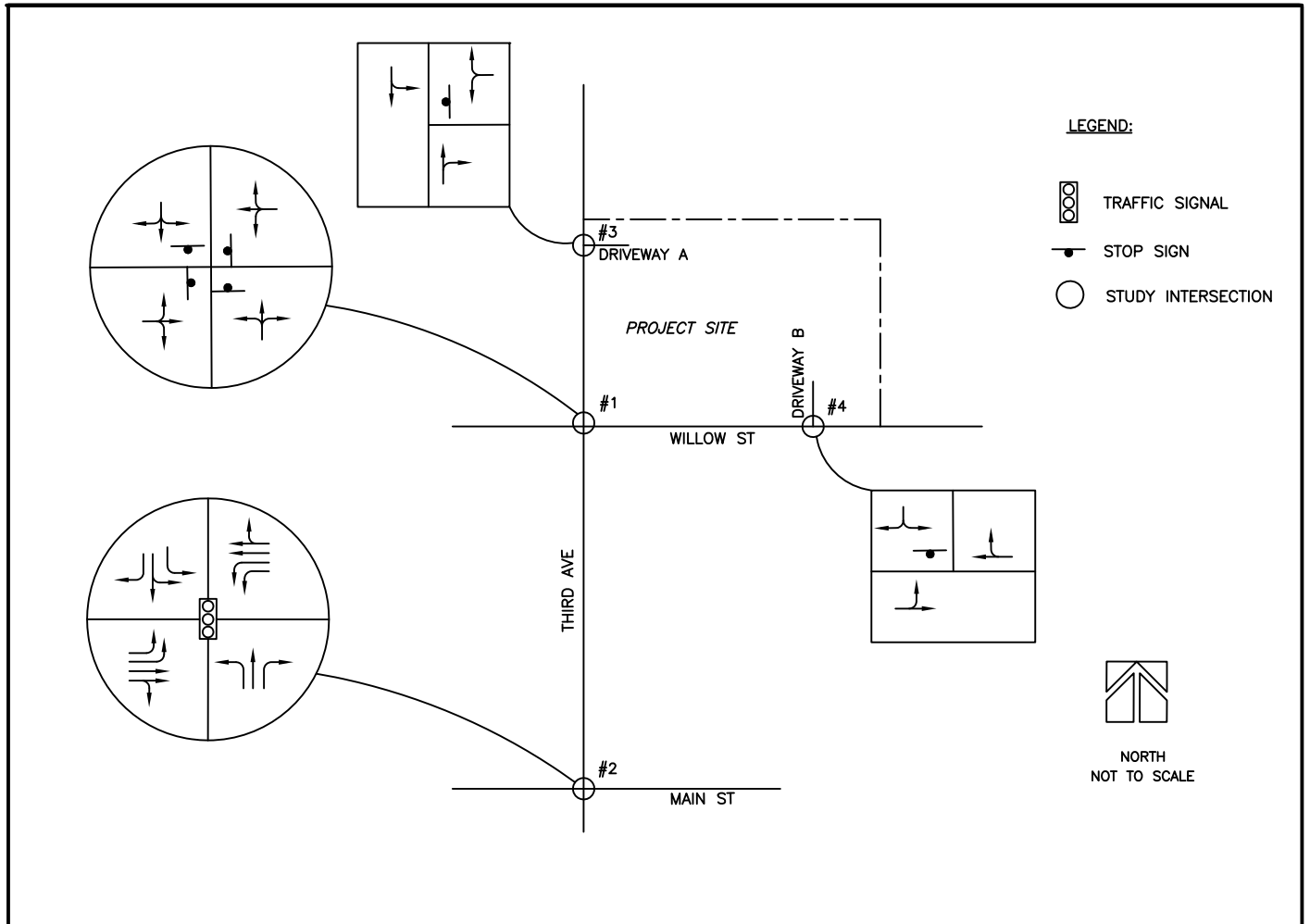
Traffic volumes for the opening year plus project traffic volumes are illustrated in **Exhibit 9**. The level of services and delays at the study intersections under this scenario are shown in **Table 6**. Analysis worksheets can be found in **Appendix C**.

All study intersections operate at acceptable LOS D or better in the AM and PM peak hours in this scenario, except the following conditions:

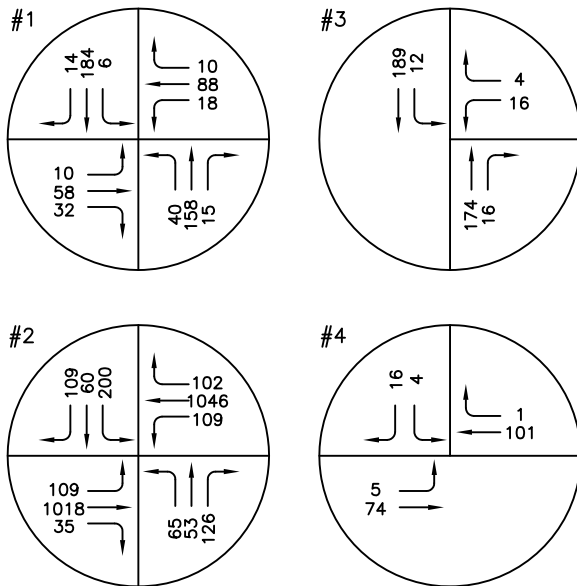
- #2 Third Ave at Main St: LOS E in the PM peak hour

Table 6. Opening Year (2025) plus Project

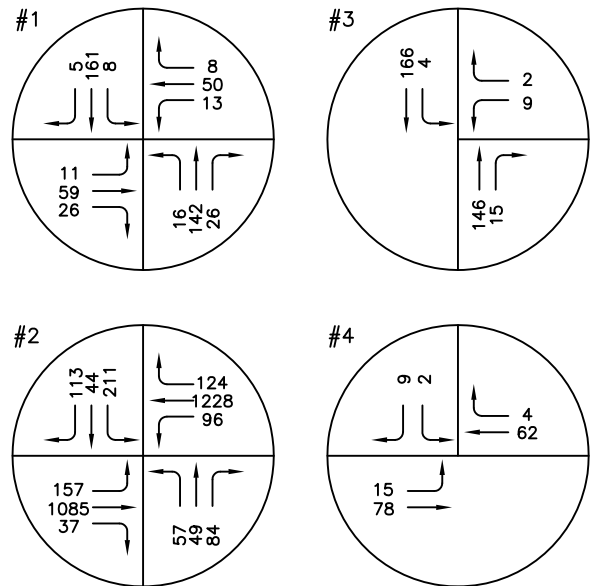
Intersection	Control	AM Peak Hour		PM Peak Hour	
		LOS	Delay (sec)	LOS	Delay (sec)
1. Third Ave at Willow St	Traffic Signal	A	9.6	A	8.9
2. Third Ave at Main St	All-Way Stop	D	54.8	E	57.9
3. Driveway A at Third Ave	Driveway Stop	B	10.8	B	10.4
4. Driveway B at Willow St	Driveway Stop	A	9.1	A	8.8



AM PEAK HOUR



PM PEAK HOUR



OPENING YEAR PLUS PROJECT TRAFFIC VOLUMES

Proposed 92-Unit Apartment Complex
NEC of Third Ave and Willow St, Hesperia

SIGNIFICANT IMPACT AND MITIGATION

According to the “*City of Hesperia Traffic Impact Analysis Guidelines for Vehicle Miles Traveled and Level of Service Assessment*,” dated July 2020, intersections within the City of Hesperia will be considered deficient if greater than LOS D. As discussed in the previous chapter of the project opening year plus project traffic, intersection #2 of Main Street at Third Avenue is expected to operate at LOS E in the PM peak hour. Therefore, the study has recommended the following mitigation measures:

- **Modify striping and traffic signal of the westbound approach on Main Street at Third Avenue to provide one exclusive left-turn lane of 160 feet queuing length and three through lanes.**
- **Modify striping and traffic signal of the eastbound approach on Main Street at Third Avenue to provide one exclusive left-turn lane of 240 feet queuing length and two through lanes.**

The study intersections are expected to operate at acceptable LOS D or better with the recommended mitigation measures as shown in **Table 7**. The project is expected to have no or less than significant traffic impact. Analysis worksheets are provided in **Appendix D**.

Table 7. Project Impact Analysis with Mitigation Measures

Intersection #2 Main St at Third Ave	Opening Year plus Project		Opening Year plus Project with Mitigation		Target LOS	Significant Impact
	LOS	Delay	LOS	Delay		
AM Peak Hour	D	54.8	D	51.7	D	No
PM Peak Hour	E	57.9	D	49.0	D	No

QUEUE ANALYSIS

The study examined the 95th percentile queue for left-turn pockets for the intersection of Main Street and Third Avenue. As shown in **Table 8**, the expected 95th percentile queue should be effectively accommodated by the striped left-turn pocket and its transitional space. Therefore, as stated in the previous chapter, the mitigation measures have recommended an extension of the westbound left-turn queuing length from 145 feet to 160 feet on Main Street at Third Avenue. Queue analysis outputs can be found in **Appendix E**.

Table 8. Queue Analysis - After Project Completion

Intersection	Turn Movement	95th Percentile Queue (ft)		Current Pocket Length (ft)	Recommended Pocket Extension
		Weekday AM Peak	Weekday PM Peak		
#2. Main St at Third Ave	EBL	136	209	240	N/A
	WBL	162	146	145	160 Ft
	NBL	69	68	80	N/A
	SBL	86	100	95	N/A

APPENDIX A

SCOPING AGREEMENT

Project Scoping Form

This scoping form shall be submitted to the City of Hesperia to assist in identifying infrastructure improvements that may be required to support traffic from the proposed project.

Approved with comments- 11/27/23-
Justin P. Schlaefli, Contract City Traffic Engineer

Project Identification:

Justin P. Schlaefli

Case Number:	
Related Cases:	
SP No.	
EIR No.	
GPA No.	
CZ No.	
Project Name:	Ouhnar Apartment Complex
Project Address:	NEC of Third Avenue and Willow Street, Hesperia (APN# 007-02-03)
Project Opening Year:	2025
Project Description:	New 92-Unit apartment complex on a vacant lot. (See Exhibit 1 for Site Plan)

	Consultant:	Developer:
Name:	K2 Traffic Engineering, Inc. (Kay Hsu, PE, TE)	Ouhnar LLC (Narbik Babakhanian)
Address:	1442 Irvine Blvd, Suite 210 Tustin, CA 92780	270 Kempton Rd Glendale, CA 91203
Telephone:	(714) 832 - 2116	(818) 317 - 4878
Fax/Email:	kay@k2traffic.com	narbikb@yahoo.com

Trip Generation Information:

Trip Generation Data Source: ITE's Trip Generation, 11th Edition (See Exhibit 2)

Current General Plan Land Use:

Medium Density Residential (MDR)

Proposed General Plan Land Use:

No Change

Current Zoning:

Multi-Family Residential (R-M)

Proposed Zoning:

No Change

	Existing Trip Generation			Proposed Trip Generation		
	In	Out	Total	In	Out	Total
AM Trips	0	0	0	12	39	51
PM Trips	0	0	0	38	22	60

Trip Internalization: ☐ Yes ☒ No (N/A % Trip Discount)

Pass-By Allowance: ☐ Yes ☒ No (N/A % Trip Discount)

Potential Screening Checks

Is your project screened from specific analyses (see Page 11 of the guidelines related to LOS assessment and Pages 24-26).

Is the project screened from LOS assessment? ☒ Yes ☐ No

LOS screening justification (see Page 11 of the guidelines): _____

The proposed project exceeds the CMP threshold of 250 two-way peak hour trips generated and add 50 or more AM or PM peak hour trips at intersection. A focused traffic impact analysis should be prepared to include the intersections of (1) Third Avenue and Willow Street, and (2) Third Avenue and Main Street.

See Exhibit 5.

the project is not screened from LOS assessment and shall conduct a focused TIS as discussed.

Is the project screened from VMT assessment? ☒ Yes ☐ No

VMT screening justification (see Pages 24-26 of the guidelines): _____

This residential project is located within a low VMT-generating area and can be presumed to have a less than significant impact. See Exhibit 3.

Level of Service Scoping

- Proposed Trip Distribution (Attach Graphic for Detailed Distribution): **SEE EXHIBIT 4**

North	South	East	West
%	%	%	%

- Attach list of Approved and Pending Projects that need to be considered (provided by the City Traffic Engineer and adjacent agencies) Project list, if any, to be provided by City Traffic Engineer and attached herein.
- Attach list of study intersections/roadway segments
- Attach site plan
- Note other specific items to be addressed:
 - Site access
 - On-site circulation
 - Parking
 - Consistency with Plans supporting Bikes/Peds/Transit
 - Other _____
- Date of Traffic Counts New or recent counts within 1 year
- Attach proposed analysis scenarios (years plus proposed forecasting approach)
- Attach proposed phasing approach (if the project is phased)

VMT Scoping

For projects that are not screened, identify the following: **NOT APPLICABLE**

- ~~Travel Demand Forecasting Model Used _____~~
- ~~Attach SBCTA Screening VMT Assessment output or describe why it is not appropriate for use~~
- ~~Attach proposed Model Land Use Inputs and Assumed Conversion Factors (attach)~~

EXHIBIT 2. TRIP GENERATION

TABLE 1. TRIP GENERATION RATE (ITE)

Multifamily Housing (Low-Rise) (220)			
Time Period	Fitted Curve Equation	IN	OUT
AM Peak Hour	$T=0.31(X) + 22.85$	24%	76%
PM Peak Hour	$T=0.43(X) + 20.55$	63%	37%
Daily	$T=6.41(X) + 75.31$	50%	50%

Source: ITE's Trip Generation, 11th Edition

TABLE 2. PROJECT TRIP GENERATION

Multifamily Housing (Low-Rise) (220)				
Time Period	Dwelling Unit	IN	OUT	TOTAL
AM Peak Hour	92	12	39	51
PM Peak Hour	92	38	22	60
Daily	92	333	333	665



EXHIBIT 3. VMT SCREENING (SBCTA)

EXHIBIT 4. TRIP DISTRIBUTION

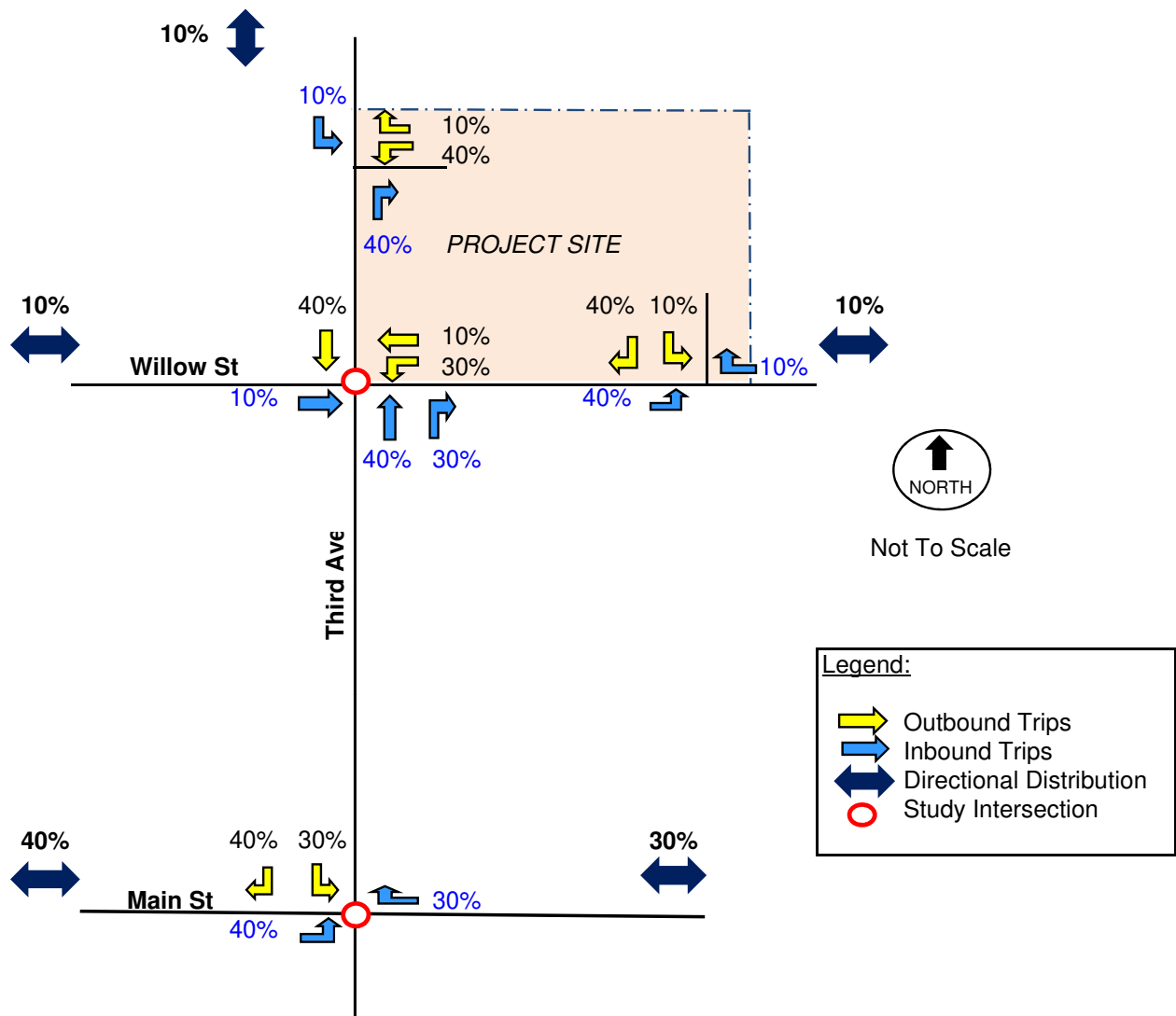


EXHIBIT 5.

A. List of Study Intersection

- 1 Third Ave at Willow St
- 2 Third Ave at Main St

B. List of Analysis Scenarios

Regional traffic growth 1.5% per year

- 1 Existing Condition
- 2 Opening Year Condition: (Existing + Growth),
- 3 Opening Year Condition + Project: (Existing + Growth + Project)
- 4 Mitigation Measure, if applicable: (Existing + Growth + Project + Mitigation Measure)

C. Phasing Approach

The project will be construction in one phase.

D. Other specific items to be addressed:

Design of Willow/Third intersection, sight distance, frontage improvements, connectivity to offsite existing improvements, etc.



frontage
improvements shall
also be discussed
and shown with
conceptual striping
as applicable.

APPENDIX B
TURNING MOVEMENT COUNT DATA

INTERSECTION TURNING MOVEMENT COUNTS

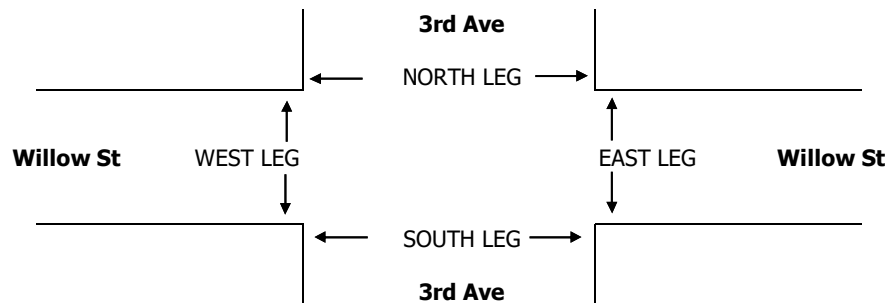
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Tue, Jan 9, 24	LOCATION: NORTH & SOUTH: EAST & WEST:	Hesperia 3rd Ave Willow St	PROJECT #: LOCATION #: CONTROL:	SC4366 1 STOP ALL
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NOTES:	AM		▲ N	
	PM			
	MD	◀ W		E ▶
	OTHER		S	
	OTHER		▼	

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	3rd Ave			3rd Ave			Willow St			Willow St			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	0	1	0	0	1	0	0	1	0	0	1	0	

AM	7:00 AM	0	17	1	2	20	0	1	3	2	1	9	1	57
	7:15 AM	1	20	4	1	27	1	0	8	3	2	11	2	80
	7:30 AM	8	32	2	1	30	3	1	12	5	2	17	1	114
	7:45 AM	11	41	4	1	53	6	6	15	10	2	29	3	181
	8:00 AM	12	46	4	3	41	3	2	13	7	1	20	2	154
	8:15 AM	8	30	1	1	39	2	1	15	9	1	16	4	127
	8:30 AM	3	36	3	1	19	1	0	16	6	2	9	2	98
	8:45 AM	2	31	2	0	31	2	2	11	5	1	12	0	99
	VOLUMES	45	253	21	10	260	18	13	93	47	12	123	15	910
	APPROACH %	14%	79%	7%	3%	90%	6%	8%	61%	31%	8%	82%	10%	
	APP/DEPART	319	/	281	288	/	319	153	/	124	150	/	186	0
PM	BEGIN PEAK HR	7:30 AM												
	VOLUMES	39	149	11	6	163	14	10	55	31	6	82	10	576
	APPROACH %	20%	75%	6%	3%	89%	8%	10%	57%	32%	6%	84%	10%	
	PEAK HR FACTOR	0.802			0.763			0.774			0.721			0.796
	APP/DEPART	199	/	169	183	/	200	96	/	72	98	/	135	0
	4:00 PM	5	38	4	2	39	2	2	8	5	3	6	2	116
	4:15 PM	3	32	0	1	26	1	3	14	7	2	8	2	99
	4:30 PM	5	21	7	1	33	0	4	11	5	2	6	3	98
	4:45 PM	4	30	7	3	38	3	1	12	4	0	9	1	112
	5:00 PM	5	31	3	1	30	1	5	15	5	1	13	1	111
	5:15 PM	4	39	1	2	43	0	4	13	9	2	12	4	133
	5:30 PM	3	23	3	2	37	1	1	14	7	3	12	2	108
	5:45 PM	3	24	2	0	20	1	1	12	3	2	10	4	82
	VOLUMES	32	238	27	12	266	9	21	99	45	15	76	19	859
	APPROACH %	11%	80%	9%	4%	93%	3%	13%	60%	27%	14%	69%	17%	
	APP/DEPART	297	/	278	287	/	326	165	/	138	110	/	117	0
	BEGIN PEAK HR	4:45 PM												
	VOLUMES	16	123	14	8	148	5	11	54	25	6	46	8	464
	APPROACH %	10%	80%	9%	5%	92%	3%	12%	60%	28%	10%	77%	13%	
	PEAK HR FACTOR	0.869			0.894			0.865			0.833			0.872
	APP/DEPART	153	/	142	161	/	179	90	/	76	60	/	67	0



INTERSECTION TURNING MOVEMENT COUNTS

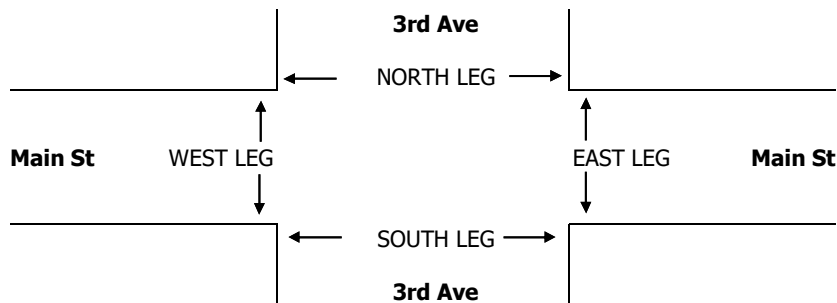
PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Tue, Jan 9, 24	LOCATION: NORTH & SOUTH: EAST & WEST:	Hesperia 3rd Ave Main St	PROJECT #: LOCATION #: CONTROL:	SC4366 2 SIGNAL
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NOTES:	AM		▲ N	
	PM			
	MD	◀ W		E ▶
	OTHER		S	
	OTHER		▼	

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	3rd Ave			3rd Ave			Main St			Main St			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	1	1	1	1.5	0.5	1	2	2	0	2	2	0	

AM	7:00 AM	1	3	8	16	8	8	4	107	9	6	180	13	363
	7:15 AM	4	11	12	18	9	10	19	148	8	13	197	11	460
	7:30 AM	7	17	20	37	10	8	26	240	13	18	205	18	619
	7:45 AM	15	15	39	56	20	15	29	260	11	33	249	24	766
	8:00 AM	19	12	25	43	18	24	22	226	8	30	271	27	725
	8:15 AM	20	11	27	43	12	23	21	233	9	24	257	18	698
	8:30 AM	9	13	31	41	8	29	29	269	6	19	238	26	718
	8:45 AM	7	10	21	48	8	24	42	220	5	19	216	27	647
	VOLUMES	82	92	183	302	93	141	192	1,703	69	162	1,813	164	4,996
	APPROACH %	23%	26%	51%	56%	17%	26%	10%	87%	4%	8%	85%	8%	
PM	APP/DEPART	357	/	448	536	/	324	1,964	/	2,188	2,139	/	2,036	0
	BEGIN PEAK HR	7:45 AM												
	VOLUMES	63	51	122	183	58	91	101	988	34	106	1,015	95	2,907
	APPROACH %	27%	22%	52%	55%	17%	27%	9%	88%	3%	9%	83%	8%	
	PEAK HR FACTOR	0.855			0.912			0.924			0.927			0.949
	APP/DEPART	236	/	247	332	/	198	1,123	/	1,293	1,216	/	1,169	0
	4:00 PM	15	13	17	43	10	27	36	257	7	35	323	24	807
	4:15 PM	12	14	21	56	12	25	35	271	11	25	317	34	833
	4:30 PM	11	11	19	59	11	21	32	265	10	18	281	23	761
	4:45 PM	17	10	25	40	10	28	35	260	8	15	271	28	747
PM	5:00 PM	14	9	22	46	16	22	25	258	7	23	298	25	765
	5:15 PM	15	12	24	63	18	33	34	260	5	32	269	20	785
	5:30 PM	11	9	23	61	17	27	29	249	6	25	265	18	740
	5:45 PM	9	8	27	31	11	19	41	241	5	19	242	14	667
	VOLUMES	104	86	178	399	105	202	267	2,061	59	192	2,266	186	6,105
	APPROACH %	28%	23%	48%	57%	15%	29%	11%	86%	2%	7%	86%	7%	
	APP/DEPART	368	/	539	706	/	356	2,387	/	2,638	2,644	/	2,572	0
	BEGIN PEAK HR	4:00 PM												
	VOLUMES	55	48	82	198	43	101	138	1,053	36	93	1,192	109	3,148
	APPROACH %	30%	26%	44%	58%	13%	30%	11%	86%	3%	7%	86%	8%	
	PEAK HR FACTOR	0.889			0.919			0.968			0.912			0.945
	APP/DEPART	185	/	295	342	/	172	1,227	/	1,333	1,394	/	1,348	0



APPENDIX C
LEVEL OF SERVICE ANALYSIS

HCM 6th AWSC
1: Third Ave & Willow St

01/31/2024

Intersection

Intersection Delay, s/veh	9.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	55	31	6	82	10	39	149	11	6	163	14
Future Vol, veh/h	10	55	31	6	82	10	39	149	11	6	163	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	60	34	7	89	11	42	162	12	7	177	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.7	8.9	9.6	9.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	10%	6%	3%
Vol Thru, %	75%	57%	84%	89%
Vol Right, %	6%	32%	10%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	199	96	98	183
LT Vol	39	10	6	6
Through Vol	149	55	82	163
RT Vol	11	31	10	14
Lane Flow Rate	216	104	107	199
Geometry Grp	1	1	1	1
Degree of Util (X)	0.282	0.141	0.148	0.258
Departure Headway (Hd)	4.694	4.874	4.993	4.671
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	761	730	714	766
Service Time	2.745	2.936	3.053	2.723
HCM Lane V/C Ratio	0.284	0.142	0.15	0.26
HCM Control Delay	9.6	8.7	8.9	9.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.2	0.5	0.5	1

HCM 6th Signalized Intersection Summary

2: Main St & Third Ave

01/31/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 					 		
Traffic Volume (veh/h)	101	988	34	106	1015	95	63	51	122	183	58	91
Future Volume (veh/h)	101	988	34	106	1015	95	63	51	122	183	58	91
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	106	1040	36	112	1068	100	66	54	128	193	61	96
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	1129	39	184	1066	100	368	387	412	676	128	201
Arrive On Green	0.05	0.32	0.32	0.05	0.32	0.32	0.21	0.21	0.21	0.20	0.20	0.20
Sat Flow, veh/h	3456	3504	121	3456	3285	307	1781	1870	1585	3456	655	1030
Grp Volume(v), veh/h	106	527	549	112	577	591	66	54	128	193	0	157
Grp Sat Flow(s),veh/h/ln	1728	1777	1849	1728	1777	1815	1781	1870	1585	1728	0	1685
Q Serve(g_s), s	2.7	25.7	25.7	2.9	29.2	29.2	2.7	2.1	1.1	4.3	0.0	7.4
Cycle Q Clear(g_c), s	2.7	25.7	25.7	2.9	29.2	29.2	2.7	2.1	1.1	4.3	0.0	7.4
Prop In Lane	1.00		0.07	1.00		0.17	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	177	573	596	184	576	589	368	387	412	676	0	329
V/C Ratio(X)	0.60	0.92	0.92	0.61	1.00	1.00	0.18	0.14	0.31	0.29	0.00	0.48
Avail Cap(c_a), veh/h	177	573	596	184	576	589	368	387	412	676	0	329
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.8	29.4	29.4	41.7	30.4	30.4	29.4	29.2	26.8	30.8	0.0	32.1
Incr Delay (d2), s/veh	14.2	22.5	21.8	14.0	37.9	37.8	1.1	0.8	2.0	1.1	0.0	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	13.9	14.4	1.5	17.8	18.2	1.3	1.0	2.4	1.8	0.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.0	51.9	51.2	55.7	68.3	68.2	30.5	29.9	28.8	31.9	0.0	37.0
LnGrp LOS	E	D	D	E	F	F	C	C	C	C	A	D
Approach Vol, veh/h	1182			1280			248			350		
Approach Delay, s/veh	51.9			67.1			29.5			34.2		
Approach LOS	D			E			C			C		
Timer - Assigned Phs	2			3			4			6		
Phs Duration (G+Y+Rc), s	23.6			9.8			34.0			22.6		
Change Period (Y+Rc), s	4.0			4.0			4.0			4.0		
Max Green Setting (Gmax), s	19.6			5.8			30.0			18.6		
Max Q Clear Time (g_c+I1), s	4.7			4.9			27.7			9.4		
Green Ext Time (p_c), s	0.7			0.0			1.4			1.1		
Intersection Summary												
HCM 6th Ctrl Delay	54.4											
HCM 6th LOS	D											

HCM 6th AWSC
1: Third Ave & Willow St

01/31/2024

Intersection

Intersection Delay, s/veh 9.6
Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	56	31	18	86	10	39	154	15	6	179	14
Future Vol, veh/h	10	56	31	18	86	10	39	154	15	6	179	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	61	34	20	93	11	42	167	16	7	195	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.9	9.3	9.9	9.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	19%	10%	16%	3%
Vol Thru, %	74%	58%	75%	90%
Vol Right, %	7%	32%	9%	7%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	208	97	114	199
LT Vol	39	10	18	6
Through Vol	154	56	86	179
RT Vol	15	31	10	14
Lane Flow Rate	226	105	124	216
Geometry Grp	1	1	1	1
Degree of Util (X)	0.299	0.146	0.175	0.285
Departure Headway (Hd)	4.764	4.979	5.097	4.747
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	751	714	698	753
Service Time	2.824	3.052	3.17	2.807
HCM Lane V/C Ratio	0.301	0.147	0.178	0.287
HCM Control Delay	9.9	8.9	9.3	9.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.3	0.5	0.6	1.2

HCM 6th Signalized Intersection Summary

2: Main St & Third Ave

01/31/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	988	34	106	1015	99	63	51	122	195	58	107
Future Volume (veh/h)	106	988	34	106	1015	99	63	51	122	195	58	107
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	112	1040	36	112	1068	104	66	54	128	205	61	113
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	1129	39	184	1061	103	368	387	412	676	115	213
Arrive On Green	0.05	0.32	0.32	0.05	0.32	0.32	0.21	0.21	0.21	0.20	0.20	0.20
Sat Flow, veh/h	3456	3504	121	3456	3272	318	1781	1870	1585	3456	587	1088
Grp Volume(v), veh/h	112	527	549	112	580	592	66	54	128	205	0	174
Grp Sat Flow(s),veh/h/ln	1728	1777	1849	1728	1777	1813	1781	1870	1585	1728	0	1675
Q Serve(g_s), s	2.9	25.7	25.7	2.9	29.2	29.2	2.7	2.1	1.1	4.6	0.0	8.4
Cycle Q Clear(g_c), s	2.9	25.7	25.7	2.9	29.2	29.2	2.7	2.1	1.1	4.6	0.0	8.4
Prop In Lane	1.00		0.07	1.00		0.18	1.00		1.00	1.00		0.65
Lane Grp Cap(c), veh/h	177	573	596	184	576	588	368	387	412	676	0	327
V/C Ratio(X)	0.63	0.92	0.92	0.61	1.01	1.01	0.18	0.14	0.31	0.30	0.00	0.53
Avail Cap(c_a), veh/h	177	573	596	184	576	588	368	387	412	676	0	327
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.9	29.4	29.4	41.7	30.4	30.4	29.4	29.2	26.8	31.0	0.0	32.5
Incr Delay (d2), s/veh	16.1	22.5	21.8	14.0	38.9	38.8	1.1	0.8	2.0	1.2	0.0	6.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	13.9	14.4	1.5	18.0	18.3	1.3	1.0	2.4	2.0	0.0	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.0	51.9	51.2	55.7	69.3	69.2	30.5	29.9	28.8	32.1	0.0	38.6
LnGrp LOS	E	D	D	E	F	F	C	C	C	C	A	D
Approach Vol, veh/h	1188			1284			248			379		
Approach Delay, s/veh	52.2			68.1			29.5			35.1		
Approach LOS	D			E			C			D		
Timer - Assigned Phs	2			3			4			6		
Phs Duration (G+Y+Rc), s	23.6			9.8			34.0			22.6		
Change Period (Y+Rc), s	4.0			4.0			4.0			4.0		
Max Green Setting (Gmax), s	19.6			5.8			30.0			18.6		
Max Q Clear Time (g_c+I1), s	4.7			4.9			27.7			10.4		
Green Ext Time (p_c), s	0.7			0.0			1.4			1.1		
Intersection Summary												
HCM 6th Ctrl Delay	54.8											
HCM 6th LOS	D											

HCM 6th TWSC

3: Third Ave & Driveway A

01/31/2024

Intersection

Int Delay, s/veh 0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	4	169	5	1	183
Future Vol, veh/h	16	4	169	5	1	183
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	4	184	5	1	199

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	388	187	0
Stage 1	187	-	-
Stage 2	201	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	616	855	-
Stage 1	845	-	-
Stage 2	833	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	615	855	-
Mov Cap-2 Maneuver	615	-	-
Stage 1	844	-	-
Stage 2	833	-	-

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

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	652	1385
HCM Lane V/C Ratio	-	-	0.033	0.001
HCM Control Delay (s)	-	-	10.7	7.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	72	98	1	4	16
Future Vol, veh/h	5	72	98	1	4	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	78	107	1	4	17

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	108	0	0 196 108
Stage 1	-	-	- 108 -
Stage 2	-	-	- 88 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1483	-	- 793 946
Stage 1	-	-	- 916 -
Stage 2	-	-	- 935 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1483	-	- 790 946
Mov Cap-2 Maneuver	-	-	- 790 -
Stage 1	-	-	- 912 -
Stage 2	-	-	- 935 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1483	-	-	-	910
HCM Lane V/C Ratio	0.004	-	-	-	0.024
HCM Control Delay (s)	7.4	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

HCM 6th AWSC
1: Third Ave & Willow St

01/31/2024

Intersection

Intersection Delay, s/veh	9.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	57	32	6	84	10	40	154	11	6	168	14
Future Vol, veh/h	10	57	32	6	84	10	40	154	11	6	168	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	62	35	7	91	11	43	167	12	7	183	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.8	9	9.7	9.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	10%	6%	3%
Vol Thru, %	75%	58%	84%	89%
Vol Right, %	5%	32%	10%	7%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	205	99	100	188
LT Vol	40	10	6	6
Through Vol	154	57	84	168
RT Vol	11	32	10	14
Lane Flow Rate	223	108	109	204
Geometry Grp	1	1	1	1
Degree of Util (X)	0.292	0.147	0.152	0.267
Departure Headway (Hd)	4.721	4.91	5.031	4.699
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	758	725	708	760
Service Time	2.775	2.975	3.097	2.754
HCM Lane V/C Ratio	0.294	0.149	0.154	0.268
HCM Control Delay	9.7	8.8	9	9.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.2	0.5	0.5	1.1

HCM 6th Signalized Intersection Summary

2: Main St & Third Ave

01/31/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 					 		
Traffic Volume (veh/h)	104	1018	35	109	1046	98	65	53	126	189	60	94
Future Volume (veh/h)	104	1018	35	109	1046	98	65	53	126	189	60	94
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	109	1072	37	115	1101	103	68	56	133	199	63	99
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	1160	40	184	1095	102	352	370	398	676	128	201
Arrive On Green	0.05	0.33	0.33	0.05	0.33	0.33	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	3456	3504	121	3456	3285	307	1781	1870	1585	3456	655	1030
Grp Volume(v), veh/h	109	543	566	115	595	609	68	56	133	199	0	162
Grp Sat Flow(s),veh/h/ln	1728	1777	1849	1728	1777	1815	1781	1870	1585	1728	0	1685
Q Serve(g_s), s	2.8	26.5	26.5	2.9	30.0	30.0	2.9	2.2	1.4	4.4	0.0	7.7
Cycle Q Clear(g_c), s	2.8	26.5	26.5	2.9	30.0	30.0	2.9	2.2	1.4	4.4	0.0	7.7
Prop In Lane	1.00		0.07	1.00		0.17	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	177	588	612	184	592	605	352	370	398	676	0	330
V/C Ratio(X)	0.62	0.92	0.92	0.62	1.00	1.01	0.19	0.15	0.33	0.29	0.00	0.49
Avail Cap(c_a), veh/h	177	588	612	184	592	605	352	370	398	676	0	330
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.8	29.0	29.0	41.7	30.0	30.0	30.1	29.9	27.5	30.9	0.0	32.2
Incr Delay (d2), s/veh	15.1	22.4	21.8	14.9	38.2	38.2	1.2	0.9	2.3	1.1	0.0	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	14.3	14.8	1.6	18.3	18.7	1.3	1.1	2.5	1.9	0.0	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.9	51.4	50.8	56.6	68.2	68.2	31.3	30.7	29.8	32.0	0.0	37.4
LnGrp LOS	E	D	D	E	F	F	C	C	C	C	A	D
Approach Vol, veh/h		1218			1319			257			361	
Approach Delay, s/veh		51.6			67.2			30.4			34.4	
Approach LOS		D			E			C			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		22.8	9.8	34.8		22.6	9.6	35.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		18.8	5.8	30.8		18.6	5.6	31.0				
Max Q Clear Time (g_c+I1), s		4.9	4.9	28.5		9.7	4.8	32.0				
Green Ext Time (p_c), s		0.7	0.0	1.4		1.1	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			54.4									
HCM 6th LOS			D									

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	58	32	18	88	10	40	158	15	6	184	14
Future Vol, veh/h	10	58	32	18	88	10	40	158	15	6	184	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	63	35	20	96	11	43	172	16	7	200	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9	9.3	10	9.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	19%	10%	16%	3%
Vol Thru, %	74%	58%	76%	90%
Vol Right, %	7%	32%	9%	7%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	213	100	116	204
LT Vol	40	10	18	6
Through Vol	158	58	88	184
RT Vol	15	32	10	14
Lane Flow Rate	232	109	126	222
Geometry Grp	1	1	1	1
Degree of Util (X)	0.308	0.151	0.18	0.294
Departure Headway (Hd)	4.789	5.009	5.131	4.771
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	746	709	693	747
Service Time	2.854	3.09	3.209	2.838
HCM Lane V/C Ratio	0.311	0.154	0.182	0.297
HCM Control Delay	10	9	9.3	9.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.3	0.5	0.7	1.2

HCM 6th Signalized Intersection Summary

2: Main St & Third Ave

01/31/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 					 		
Traffic Volume (veh/h)	109	1018	35	109	1046	102	65	53	126	200	60	109
Future Volume (veh/h)	109	1018	35	109	1046	102	65	53	126	200	60	109
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	1072	37	115	1101	107	68	56	133	211	63	115
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	1160	40	184	1091	106	352	370	398	676	116	212
Arrive On Green	0.05	0.33	0.33	0.05	0.33	0.33	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	3456	3504	121	3456	3272	318	1781	1870	1585	3456	593	1082
Grp Volume(v), veh/h	115	543	566	115	597	611	68	56	133	211	0	178
Grp Sat Flow(s),veh/h/ln	1728	1777	1849	1728	1777	1813	1781	1870	1585	1728	0	1676
Q Serve(g_s), s	2.9	26.5	26.5	2.9	30.0	30.0	2.9	2.2	1.4	4.7	0.0	8.6
Cycle Q Clear(g_c), s	2.9	26.5	26.5	2.9	30.0	30.0	2.9	2.2	1.4	4.7	0.0	8.6
Prop In Lane	1.00		0.07	1.00		0.18	1.00		1.00	1.00		0.65
Lane Grp Cap(c), veh/h	177	588	612	184	592	604	352	370	398	676	0	328
V/C Ratio(X)	0.65	0.92	0.92	0.62	1.01	1.01	0.19	0.15	0.33	0.31	0.00	0.54
Avail Cap(c_a), veh/h	177	588	612	184	592	604	352	370	398	676	0	328
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.9	29.0	29.0	41.7	30.0	30.0	30.1	29.9	27.5	31.0	0.0	32.6
Incr Delay (d2), s/veh	17.1	22.4	21.8	14.9	39.1	39.2	1.2	0.9	2.3	1.2	0.0	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	14.3	14.8	1.6	18.5	18.9	1.3	1.1	2.5	2.0	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.1	51.4	50.8	56.6	69.1	69.2	31.3	30.7	29.8	32.2	0.0	38.9
LnGrp LOS	E	D	D	E	F	F	C	C	C	C	A	D
Approach Vol, veh/h		1224			1323			257			389	
Approach Delay, s/veh		51.9			68.1			30.4			35.3	
Approach LOS		D			E			C			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		22.8	9.8	34.8		22.6	9.6	35.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		18.8	5.8	30.8		18.6	5.6	31.0				
Max Q Clear Time (g_c+I1), s		4.9	4.9	28.5		10.6	4.9	32.0				
Green Ext Time (p_c), s		0.7	0.0	1.4		1.1	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			54.8									
HCM 6th LOS			D									

HCM 6th TWSC
3: Third Ave & Driveway A

01/31/2024

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	4	174	5	1	189
Future Vol, veh/h	16	4	174	5	1	189
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	4	189	5	1	205
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	399	192	0	0	194	0
Stage 1	192	-	-	-	-	-
Stage 2	207	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	607	850	-	-	1379	-
Stage 1	841	-	-	-	-	-
Stage 2	828	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	606	850	-	-	1379	-
Mov Cap-2 Maneuver	606	-	-	-	-	-
Stage 1	840	-	-	-	-	-
Stage 2	828	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.8	0	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	643	1379	-	
HCM Lane V/C Ratio	-	-	0.034	0.001	-	
HCM Control Delay (s)	-	-	10.8	7.6	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

HCM 6th TWSC
4: Willow St & Driveway B

01/31/2024

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	74	101	1	4	16
Future Vol, veh/h	5	74	101	1	4	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	80	110	1	4	17

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	111	0	0 201 111
Stage 1	-	-	- 111 -
Stage 2	-	-	- 90 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1479	-	- 788 942
Stage 1	-	-	- 914 -
Stage 2	-	-	- 934 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1479	-	- 785 942
Mov Cap-2 Maneuver	-	-	- 785 -
Stage 1	-	-	- 910 -
Stage 2	-	-	- 934 -

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1479	-	-	-	906
HCM Lane V/C Ratio	0.004	-	-	-	0.024
HCM Control Delay (s)	7.4	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

HCM 6th Signalized Intersection Summary

2: Main St & Third Ave

02/01/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			  					 		
Traffic Volume (veh/h)	109	1018	35	109	1046	102	65	53	126	200	60	109
Future Volume (veh/h)	109	1018	35	109	1046	102	65	53	126	200	60	109
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	1072	37	115	1101	107	68	56	133	211	63	115
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	182	1067	37	139	1325	129	358	376	442	672	115	210
Arrive On Green	0.10	0.30	0.30	0.08	0.28	0.28	0.20	0.20	0.20	0.19	0.19	0.19
Sat Flow, veh/h	1781	3504	121	1781	4732	459	1781	1870	1585	3456	593	1082
Grp Volume(v), veh/h	115	543	566	115	792	416	68	56	133	211	0	178
Grp Sat Flow(s),veh/h/ln	1781	1777	1849	1781	1702	1788	1781	1870	1585	1728	0	1676
Q Serve(g_s), s	5.6	27.4	27.4	5.7	19.6	19.7	2.9	2.2	0.0	4.7	0.0	8.6
Cycle Q Clear(g_c), s	5.6	27.4	27.4	5.7	19.6	19.7	2.9	2.2	0.0	4.7	0.0	8.6
Prop In Lane	1.00		0.07	1.00		0.26	1.00		1.00	1.00		0.65
Lane Grp Cap(c), veh/h	182	541	563	139	953	501	358	376	442	672	0	326
V/C Ratio(X)	0.63	1.00	1.00	0.83	0.83	0.83	0.19	0.15	0.30	0.31	0.00	0.55
Avail Cap(c_a), veh/h	182	541	563	139	953	501	358	376	442	672	0	326
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	38.8	31.3	31.3	40.9	30.4	30.4	29.9	29.6	25.5	31.1	0.0	32.7
Incr Delay (d2), s/veh	15.5	39.8	39.1	41.2	8.3	14.9	1.2	0.8	1.7	1.2	0.0	6.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	17.1	17.7	4.0	8.8	10.1	1.3	1.1	2.4	2.0	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.3	71.1	70.4	82.1	38.7	45.3	31.0	30.4	27.3	32.3	0.0	39.1
LnGrp LOS	D	F	F	F	D	D	C	C	C	C	A	D
Approach Vol, veh/h	1224		1323				257			389		
Approach Delay, s/veh	69.2		44.6				29.0			35.4		
Approach LOS	E		D				C			D		
Timer - Assigned Phs	2		3		4		6		7		8	
Phs Duration (G+Y+Rc), s	23.1		12.0		32.4		22.5		14.2		30.2	
Change Period (Y+Rc), s	4.0		4.0		4.0		4.0		4.0			
Max Green Setting (Gmax), s	19.1		8.0		28.4		18.5		10.2		26.2	
Max Q Clear Time (g_c+I1), s	4.9		7.7		29.4		10.6		7.6		21.7	
Green Ext Time (p_c), s	0.7		0.0		0.0		1.1		0.1		2.9	
Intersection Summary												
HCM 6th Ctrl Delay			51.7									
HCM 6th LOS			D									

HCM 6th AWSC
1: Third Ave & Willow St

01/31/2024

Intersection

Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	54	25	6	46	8	16	123	14	8	148	5
Future Vol, veh/h	11	54	25	6	46	8	16	123	14	8	148	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	59	27	7	50	9	17	134	15	9	161	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.4	8.3	8.7	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	12%	10%	5%
Vol Thru, %	80%	60%	77%	92%
Vol Right, %	9%	28%	13%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	153	90	60	161
LT Vol	16	11	6	8
Through Vol	123	54	46	148
RT Vol	14	25	8	5
Lane Flow Rate	166	98	65	175
Geometry Grp	1	1	1	1
Degree of Util (X)	0.207	0.126	0.087	0.219
Departure Headway (Hd)	4.485	4.654	4.776	4.501
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	800	770	749	798
Service Time	2.515	2.687	2.811	2.529
HCM Lane V/C Ratio	0.207	0.127	0.087	0.219
HCM Control Delay	8.7	8.4	8.3	8.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.4	0.3	0.8

HCM 6th Signalized Intersection Summary

2: Main St & Third Ave

01/31/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	138	1053	36	93	1192	109	55	48	82	198	43	101
Future Volume (veh/h)	138	1053	36	93	1192	109	55	48	82	198	43	101
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	145	1108	38	98	1255	115	58	51	86	208	45	106
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	187	1388	48	173	1291	118	317	333	361	608	87	205
Arrive On Green	0.05	0.40	0.40	0.05	0.39	0.39	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	3456	3505	120	3456	3292	301	1781	1870	1585	3456	495	1166
Grp Volume(v), veh/h	145	562	584	98	676	694	58	51	86	208	0	151
Grp Sat Flow(s),veh/h/ln	1728	1777	1849	1728	1777	1816	1781	1870	1585	1728	0	1661
Q Serve(g_s), s	4.1	27.9	27.9	2.8	37.3	37.6	2.8	2.3	0.0	5.3	0.0	8.2
Cycle Q Clear(g_c), s	4.1	27.9	27.9	2.8	37.3	37.6	2.8	2.3	0.0	5.3	0.0	8.2
Prop In Lane	1.00		0.07	1.00		0.17	1.00		1.00	1.00		0.70
Lane Grp Cap(c), veh/h	187	704	732	173	697	712	317	333	361	608	0	292
V/C Ratio(X)	0.78	0.80	0.80	0.57	0.97	0.98	0.18	0.15	0.24	0.34	0.00	0.52
Avail Cap(c_a), veh/h	187	704	732	173	697	712	317	333	361	608	0	292
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.7	26.7	26.7	46.4	29.8	29.9	34.9	34.7	31.5	36.1	0.0	37.3
Incr Delay (d2), s/veh	26.6	9.2	8.9	12.8	27.6	28.2	1.3	1.0	1.5	1.5	0.0	6.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	13.0	13.5	1.5	20.4	21.1	1.3	1.1	1.8	2.3	0.0	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.3	35.9	35.5	59.3	57.4	58.1	36.2	35.7	33.1	37.7	0.0	43.7
LnGrp LOS	E	D	D	E	E	E	D	D	C	D	A	D
Approach Vol, veh/h	1291			1468			195			359		
Approach Delay, s/veh	39.9			57.8			34.7			40.2		
Approach LOS	D			E			C			D		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	22.8		10.0	44.6		22.6		10.4	44.2			
Change Period (Y+Rc), s	4.0		4.0	4.0		4.0		4.0	4.0			
Max Green Setting (Gmax), s	18.8		6.0	40.6		18.6		6.4	40.2			
Max Q Clear Time (g_c+I1), s	4.8		4.8	29.9		10.2		6.1	39.6			
Green Ext Time (p_c), s	0.5		0.0	5.3		1.0		0.0	0.5			
Intersection Summary												
HCM 6th Ctrl Delay	47.6											
HCM 6th LOS	D											

HCM 6th AWSC
1: Third Ave & Willow St

01/31/2024

Intersection

Intersection Delay, s/veh 8.9
Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	58	25	13	48	8	16	138	25	8	157	5
Future Vol, veh/h	11	58	25	13	48	8	16	138	25	8	157	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	63	27	14	52	9	17	150	27	9	171	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.6	8.5	9	9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	9%	12%	19%	5%
Vol Thru, %	77%	62%	70%	92%
Vol Right, %	14%	27%	12%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	179	94	69	170
LT Vol	16	11	13	8
Through Vol	138	58	48	157
RT Vol	25	25	8	5
Lane Flow Rate	195	102	75	185
Geometry Grp	1	1	1	1
Degree of Util (X)	0.244	0.135	0.102	0.235
Departure Headway (Hd)	4.512	4.765	4.904	4.579
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	796	750	728	783
Service Time	2.546	2.808	2.949	2.613
HCM Lane V/C Ratio	0.245	0.136	0.103	0.236
HCM Control Delay	9	8.6	8.5	9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.5	0.3	0.9

HCM 6th Signalized Intersection Summary

2: Main St & Third Ave

01/31/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	153	1053	36	93	1192	120	55	48	82	205	43	110
Future Volume (veh/h)	153	1053	36	93	1192	120	55	48	82	205	43	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	161	1108	38	98	1255	126	58	51	86	216	45	116
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	200	1367	47	173	1246	125	328	344	371	608	81	210
Arrive On Green	0.06	0.39	0.39	0.05	0.38	0.38	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	3456	3505	120	3456	3262	327	1781	1870	1585	3456	463	1193
Grp Volume(v), veh/h	161	562	584	98	682	699	58	51	86	216	0	161
Grp Sat Flow(s),veh/h/ln	1728	1777	1849	1728	1777	1812	1781	1870	1585	1728	0	1656
Q Serve(g_s), s	4.6	28.2	28.2	2.8	38.2	38.2	2.7	2.3	0.0	5.5	0.0	8.9
Cycle Q Clear(g_c), s	4.6	28.2	28.2	2.8	38.2	38.2	2.7	2.3	0.0	5.5	0.0	8.9
Prop In Lane	1.00		0.07	1.00		0.18	1.00		1.00	1.00		0.72
Lane Grp Cap(c), veh/h	200	693	721	173	679	692	328	344	371	608	0	291
V/C Ratio(X)	0.80	0.81	0.81	0.57	1.00	1.01	0.18	0.15	0.23	0.36	0.00	0.55
Avail Cap(c_a), veh/h	200	693	721	173	679	692	328	344	371	608	0	291
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.5	27.2	27.2	46.4	30.9	30.9	34.4	34.2	31.0	36.2	0.0	37.6
Incr Delay (d2), s/veh	27.9	9.9	9.6	12.8	35.7	36.8	1.2	0.9	1.5	1.6	0.0	7.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	13.3	13.7	1.5	22.2	22.8	1.3	1.1	1.8	2.4	0.0	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.4	37.1	36.8	59.3	66.6	67.7	35.6	35.1	32.5	37.8	0.0	45.0
LnGrp LOS	E	D	D	E	F	F	D	D	C	D	A	D
Approach Vol, veh/h		1307			1479			195			377	
Approach Delay, s/veh		41.6			66.6			34.1			40.9	
Approach LOS		D			E			C			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		23.4	10.0	44.0		22.6	10.8	43.2				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		19.4	6.0	40.0		18.6	6.8	39.2				
Max Q Clear Time (g_c+I1), s		4.7	4.8	30.2		10.9	6.6	40.2				
Green Ext Time (p_c), s		0.5	0.0	5.0		1.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			52.1									
HCM 6th LOS			D									

HCM 6th TWSC
3: Third Ave & Driveway A

01/31/2024

Intersection

Int Delay, s/veh 0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	2	142	15	4	161
Future Vol, veh/h	9	2	142	15	4	161
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	2	154	16	4	175

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	345	162	0
Stage 1	162	-	-
Stage 2	183	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	652	883	-
Stage 1	867	-	-
Stage 2	848	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	650	883	-
Mov Cap-2 Maneuver	650	-	-
Stage 1	864	-	-
Stage 2	848	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	683	1407
HCM Lane V/C Ratio	-	-	0.018	0.003
HCM Control Delay (s)	-	-	10.4	7.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	76	60	4	2	9
Future Vol, veh/h	15	76	60	4	2	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	83	65	4	2	10

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	69	0	0 182 67
Stage 1	-	-	- 67 -
Stage 2	-	-	- 115 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1532	-	- 807 997
Stage 1	-	-	- 956 -
Stage 2	-	-	- 910 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1532	-	- 798 997
Mov Cap-2 Maneuver	-	-	- 798 -
Stage 1	-	-	- 945 -
Stage 2	-	-	- 910 -

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1532	-	-	-	954
HCM Lane V/C Ratio	0.011	-	-	-	0.013
HCM Control Delay (s)	7.4	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

HCM 6th AWSC
1: Third Ave & Willow St

01/31/2024

Intersection

Intersection Delay, s/veh 8.7
Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	56	26	6	47	8	16	127	14	8	152	5
Future Vol, veh/h	11	56	26	6	47	8	16	127	14	8	152	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	61	28	7	51	9	17	138	15	9	165	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.4	8.3	8.8	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	12%	10%	5%
Vol Thru, %	81%	60%	77%	92%
Vol Right, %	9%	28%	13%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	157	93	61	165
LT Vol	16	11	6	8
Through Vol	127	56	47	152
RT Vol	14	26	8	5
Lane Flow Rate	171	101	66	179
Geometry Grp	1	1	1	1
Degree of Util (X)	0.214	0.131	0.088	0.225
Departure Headway (Hd)	4.506	4.674	4.804	4.519
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	797	766	745	795
Service Time	2.533	2.71	2.842	2.548
HCM Lane V/C Ratio	0.215	0.132	0.089	0.225
HCM Control Delay	8.8	8.4	8.3	8.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.4	0.3	0.9

HCM 6th Signalized Intersection Summary

2: Main St & Third Ave

01/31/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	1085	37	96	1228	112	57	49	84	204	44	104
Future Volume (veh/h)	142	1085	37	96	1228	112	57	49	84	204	44	104
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	149	1142	39	101	1293	118	60	52	88	215	46	109
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	187	1378	47	180	1288	117	319	335	366	608	87	205
Arrive On Green	0.05	0.39	0.39	0.05	0.39	0.39	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	3456	3506	120	3456	3294	300	1781	1870	1585	3456	493	1168
Grp Volume(v), veh/h	149	579	602	101	696	715	60	52	88	215	0	155
Grp Sat Flow(s),veh/h/ln	1728	1777	1849	1728	1777	1816	1781	1870	1585	1728	0	1660
Q Serve(g_s), s	4.3	29.3	29.3	2.9	39.1	39.1	2.9	2.3	0.0	5.5	0.0	8.5
Cycle Q Clear(g_c), s	4.3	29.3	29.3	2.9	39.1	39.1	2.9	2.3	0.0	5.5	0.0	8.5
Prop In Lane	1.00		0.06	1.00		0.16	1.00		1.00	1.00		0.70
Lane Grp Cap(c), veh/h	187	698	727	180	695	710	319	335	366	608	0	292
V/C Ratio(X)	0.80	0.83	0.83	0.56	1.00	1.01	0.19	0.16	0.24	0.35	0.00	0.53
Avail Cap(c_a), veh/h	187	698	727	180	695	710	319	335	366	608	0	292
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.8	27.3	27.3	46.3	30.4	30.5	34.9	34.7	31.3	36.2	0.0	37.4
Incr Delay (d2), s/veh	29.0	10.9	10.6	12.1	34.5	35.6	1.3	1.0	1.5	1.6	0.0	6.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	13.9	14.4	1.5	22.4	23.1	1.3	1.1	1.9	2.4	0.0	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.7	38.2	37.9	58.4	64.9	66.0	36.2	35.7	32.9	37.8	0.0	44.2
LnGrp LOS	E	D	D	E	F	F	D	D	C	D	A	D
Approach Vol, veh/h		1330			1512			200			370	
Approach Delay, s/veh		42.3			65.0			34.6			40.5	
Approach LOS		D			E			C			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		22.9	10.2	44.3		22.6	10.4	44.1				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		18.9	6.2	40.3		18.6	6.4	40.1				
Max Q Clear Time (g_c+I1), s		4.9	4.9	31.3		10.5	6.3	41.1				
Green Ext Time (p_c), s		0.5	0.0	4.8		1.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			51.7									
HCM 6th LOS			D									

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	11	59	26	13	50	8	16	142	26	8	161	5
Future Vol, veh/h	11	59	26	13	50	8	16	142	26	8	161	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	64	28	14	54	9	17	154	28	9	175	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.6	8.6	9.1	9.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	9%	11%	18%	5%
Vol Thru, %	77%	61%	70%	93%
Vol Right, %	14%	27%	11%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	184	96	71	174
LT Vol	16	11	13	8
Through Vol	142	59	50	161
RT Vol	26	26	8	5
Lane Flow Rate	200	104	77	189
Geometry Grp	1	1	1	1
Degree of Util (X)	0.252	0.139	0.106	0.242
Departure Headway (Hd)	4.529	4.789	4.933	4.598
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	792	746	724	779
Service Time	2.567	2.837	2.983	2.636
HCM Lane V/C Ratio	0.253	0.139	0.106	0.243
HCM Control Delay	9.1	8.6	8.6	9.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.5	0.4	0.9

HCM 6th Signalized Intersection Summary

2: Main St & Third Ave

01/31/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	1085	37	96	1228	124	57	49	84	211	44	113
Future Volume (veh/h)	157	1085	37	96	1228	124	57	49	84	211	44	113
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	165	1142	39	101	1293	131	60	52	88	222	46	119
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	194	1346	46	180	1238	125	335	352	380	608	81	210
Arrive On Green	0.06	0.38	0.38	0.05	0.38	0.38	0.19	0.19	0.19	0.18	0.18	0.18
Sat Flow, veh/h	3456	3506	120	3456	3259	329	1781	1870	1585	3456	462	1194
Grp Volume(v), veh/h	165	579	602	101	703	721	60	52	88	222	0	165
Grp Sat Flow(s),veh/h/ln	1728	1777	1849	1728	1777	1811	1781	1870	1585	1728	0	1655
Q Serve(g_s), s	4.7	29.7	29.8	2.9	38.0	38.0	2.8	2.3	0.0	5.7	0.0	9.1
Cycle Q Clear(g_c), s	4.7	29.7	29.8	2.9	38.0	38.0	2.8	2.3	0.0	5.7	0.0	9.1
Prop In Lane	1.00		0.06	1.00		0.18	1.00		1.00	1.00		0.72
Lane Grp Cap(c), veh/h	194	682	710	180	675	688	335	352	380	608	0	291
V/C Ratio(X)	0.85	0.85	0.85	0.56	1.04	1.05	0.18	0.15	0.23	0.37	0.00	0.57
Avail Cap(c_a), veh/h	194	682	710	180	675	688	335	352	380	608	0	291
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.8	28.1	28.1	46.3	31.0	31.0	34.1	33.9	30.6	36.3	0.0	37.7
Incr Delay (d2), s/veh	35.2	12.5	12.1	12.1	45.7	47.5	1.2	0.9	1.4	1.7	0.0	7.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	14.4	14.9	1.5	23.9	24.7	1.3	1.1	1.8	2.5	0.0	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.0	40.6	40.2	58.4	76.7	78.5	35.3	34.8	32.0	38.0	0.0	45.5
LnGrp LOS	F	D	D	E	F	F	D	C	C	D	A	D
Approach Vol, veh/h		1346			1525			200			387	
Approach Delay, s/veh		45.5			76.4			33.7			41.2	
Approach LOS		D			E			C			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		23.8	10.2	43.4		22.6	10.6	43.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		19.8	6.2	39.4		18.6	6.6	39.0				
Max Q Clear Time (g_c+I1), s		4.8	4.9	31.8		11.1	6.7	40.0				
Green Ext Time (p_c), s		0.6	0.0	4.3		1.0	0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			57.9									
HCM 6th LOS			E									

HCM 6th TWSC
3: Third Ave & Driveway A

01/31/2024

Intersection

Int Delay, s/veh 0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	2	146	15	4	166
Future Vol, veh/h	9	2	146	15	4	166
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	2	159	16	4	180

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	355	167	0
Stage 1	167	-	-
Stage 2	188	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	643	877	-
Stage 1	863	-	-
Stage 2	844	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	641	877	-
Mov Cap-2 Maneuver	641	-	-
Stage 1	860	-	-
Stage 2	844	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	674	1401
HCM Lane V/C Ratio	-	-	0.018	0.003
HCM Control Delay (s)	-	-	10.4	7.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th TWSC
4: Willow St & Driveway B

01/31/2024

Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	78	62	4	2	9
Future Vol, veh/h	15	78	62	4	2	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	85	67	4	2	10

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	71	0	0 186 69
Stage 1	-	-	- 69 -
Stage 2	-	-	- 117 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1529	-	- 803 994
Stage 1	-	-	- 954 -
Stage 2	-	-	- 908 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1529	-	- 794 994
Mov Cap-2 Maneuver	-	-	- 794 -
Stage 1	-	-	- 944 -
Stage 2	-	-	- 908 -

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1529	-	-	-	950
HCM Lane V/C Ratio	0.011	-	-	-	0.013
HCM Control Delay (s)	7.4	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

HCM 6th Signalized Intersection Summary

2: Main St & Third Ave

02/01/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	1085	37	96	1228	124	57	49	84	211	44	113
Future Volume (veh/h)	157	1085	37	96	1228	124	57	49	84	211	44	113
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	165	1142	39	101	1293	131	60	52	88	222	46	119
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	214	1227	42	143	1460	148	346	363	434	608	81	210
Arrive On Green	0.12	0.35	0.35	0.08	0.31	0.31	0.19	0.19	0.19	0.18	0.18	0.18
Sat Flow, veh/h	1781	3506	120	1781	4711	477	1781	1870	1585	3456	462	1194
Grp Volume(v), veh/h	165	579	602	101	934	490	60	52	88	222	0	165
Grp Sat Flow(s),veh/h/ln	1781	1777	1849	1781	1702	1784	1781	1870	1585	1728	0	1655
Q Serve(g_s), s	9.0	31.4	31.4	5.5	26.1	26.1	2.8	2.3	0.0	5.7	0.0	9.1
Cycle Q Clear(g_c), s	9.0	31.4	31.4	5.5	26.1	26.1	2.8	2.3	0.0	5.7	0.0	9.1
Prop In Lane	1.00		0.06	1.00		0.27	1.00		1.00	1.00		0.72
Lane Grp Cap(c), veh/h	214	622	647	143	1055	553	346	363	434	608	0	291
V/C Ratio(X)	0.77	0.93	0.93	0.71	0.89	0.89	0.17	0.14	0.20	0.37	0.00	0.57
Avail Cap(c_a), veh/h	214	622	647	143	1055	553	346	363	434	608	0	291
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.7	31.3	31.3	44.9	32.8	32.8	33.6	33.4	27.9	36.3	0.0	37.7
Incr Delay (d2), s/veh	23.2	22.5	22.0	25.7	10.9	18.5	1.1	0.8	1.1	1.7	0.0	7.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	16.7	17.3	3.4	11.9	13.7	1.3	1.1	1.7	2.5	0.0	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.9	53.8	53.3	70.6	43.7	51.3	34.7	34.2	29.0	38.0	0.0	45.5
LnGrp LOS	E	D	D	E	D	D	C	C	C	D	A	D
Approach Vol, veh/h		1346			1525			200			387	
Approach Delay, s/veh		55.1			47.9			32.1			41.2	
Approach LOS		E			D			C			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		24.4	13.0	40.0		22.6	17.0	36.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		20.4	9.0	36.0		18.6	13.0	32.0				
Max Q Clear Time (g_c+I1), s		4.8	7.5	33.4		11.1	11.0	28.1				
Green Ext Time (p_c), s		0.6	0.0	1.7		1.0	0.1	2.8				
Intersection Summary												
HCM 6th Ctrl Delay			49.0									
HCM 6th LOS			D									

APPENDIX D

QUEUING ANALYSIS

Queues

2: Main St & Third Ave

02/01/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	115	1109	115	1208	68	56	133	211	178
v/c Ratio	0.64	1.03	0.84	0.85	0.19	0.15	0.22	0.32	0.45
Control Delay	56.2	67.9	86.6	37.3	31.6	30.9	6.4	32.7	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	67.9	86.6	37.3	31.6	30.9	6.4	32.7	20.0
Queue Length 50th (ft)	64	~358	66	234	32	26	5	53	42
Queue Length 95th (ft)	#136	#488	#162	290	69	59	44	86	103
Internal Link Dist (ft)		302		226		301			2202
Turn Bay Length (ft)	240		145		80		100	95	
Base Capacity (vph)	180	1075	137	1418	355	374	608	667	400
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	1.03	0.84	0.85	0.19	0.15	0.22	0.32	0.45

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

2: Main St & Third Ave

02/01/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	165	1181	101	1424	60	52	88	222	165
v/c Ratio	0.78	0.96	0.72	0.91	0.17	0.14	0.15	0.37	0.43
Control Delay	68.0	49.5	73.0	42.6	35.3	34.7	5.0	38.3	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.0	49.5	73.0	42.6	35.3	34.7	5.0	38.3	17.1
Queue Length 50th (ft)	104	381	64	314	32	28	0	64	29
Queue Length 95th (ft)	#209	#527	#146	#404	68	61	29	100	89
Internal Link Dist (ft)		302		226		301			2202
Turn Bay Length (ft)	240		145		80		100	95	
Base Capacity (vph)	212	1235	141	1566	343	361	579	604	385
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.96	0.72	0.91	0.17	0.14	0.15	0.37	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Project Scoping Form

This scoping form shall be submitted to the City of Hesperia to assist in identifying infrastructure improvements that may be required to support traffic from the proposed project.

Approved with comments- 11/27/23-
Justin P. Schlaefli, Contract City Traffic Engineer

Project Identification:

Justin P. Schlaefli

Case Number:	
Related Cases:	
SP No.	
EIR No.	
GPA No.	
CZ No.	
Project Name:	Ouhnar Apartment Complex
Project Address:	NEC of Third Avenue and Willow Street, Hesperia (APN# 007-02-03)
Project Opening Year:	2025
Project Description:	New 92-Unit apartment complex on a vacant lot. (See Exhibit 1 for Site Plan)

	Consultant:	Developer:
Name:	K2 Traffic Engineering, Inc. (Kay Hsu, PE, TE)	Ouhnar LLC (Narbik Babakhanian)
Address:	1442 Irvine Blvd, Suite 210 Tustin, CA 92780	270 Kempton Rd Glendale, CA 91203
Telephone:	(714) 832 - 2116	(818) 317 - 4878
Fax/Email:	kay@k2traffic.com	narbikb@yahoo.com

Trip Generation Information:

Trip Generation Data Source: ITE's Trip Generation, 11th Edition (See Exhibit 2)

Current General Plan Land Use:

Medium Density Residential (MDR)

Proposed General Plan Land Use:

No Change

Current Zoning:

Multi-Family Residential (R-M)

Proposed Zoning:

No Change

	Existing Trip Generation			Proposed Trip Generation		
	In	Out	Total	In	Out	Total
AM Trips	0	0	0	12	39	51
PM Trips	0	0	0	38	22	60

Trip Internalization: ☐ Yes ☒ No (N/A % Trip Discount)

Pass-By Allowance: ☐ Yes ☒ No (N/A % Trip Discount)

Potential Screening Checks

Is your project screened from specific analyses (see Page 11 of the guidelines related to LOS assessment and Pages 24-26).

Is the project screened from LOS assessment? ☒ Yes ☐ No

LOS screening justification (see Page 11 of the guidelines): _____

The proposed project exceeds the CMP threshold of 250 two-way peak hour trips generated and add 50 or more AM or PM peak hour trips at intersection. A focused traffic impact analysis should be prepared to include the intersections of (1) Third Avenue and Willow Street, and (2) Third Avenue and Main Street.

See Exhibit 5.

the project is not screened from LOS assessment and shall conduct a focused TIS as discussed.

Is the project screened from VMT assessment? ☒ Yes ☐ No

VMT screening justification (see Pages 24-26 of the guidelines): _____

This residential project is located within a low VMT-generating area and can be presumed to have a less than significant impact. See Exhibit 3.

Level of Service Scoping

- Proposed Trip Distribution (Attach Graphic for Detailed Distribution): **SEE EXHIBIT 4**

North	South	East	West
%	%	%	%

- Attach list of Approved and Pending Projects that need to be considered (provided by the City Traffic Engineer and adjacent agencies) Project list, if any, to be provided by City Traffic Engineer and attached herein.
- Attach list of study intersections/roadway segments
- Attach site plan
- Note other specific items to be addressed:
 - Site access
 - On-site circulation
 - Parking
 - Consistency with Plans supporting Bikes/Peds/Transit
 - Other _____
- Date of Traffic Counts New or recent counts within 1 year
- Attach proposed analysis scenarios (years plus proposed forecasting approach)
- Attach proposed phasing approach (if the project is phased)

VMT Scoping

For projects that are not screened, identify the following: **NOT APPLICABLE**

- ~~Travel Demand Forecasting Model Used _____~~
- ~~Attach SBCTA Screening VMT Assessment output or describe why it is not appropriate for use~~
- ~~Attach proposed Model Land Use Inputs and Assumed Conversion Factors (attach)~~

EXHIBIT 2. TRIP GENERATION

TABLE 1. TRIP GENERATION RATE (ITE)

Multifamily Housing (Low-Rise) (220)			
Time Period	Fitted Curve Equation	IN	OUT
AM Peak Hour	$T=0.31(X) + 22.85$	24%	76%
PM Peak Hour	$T=0.43(X) + 20.55$	63%	37%
Daily	$T=6.41(X) + 75.31$	50%	50%

Source: ITE's Trip Generation, 11th Edition

TABLE 2. PROJECT TRIP GENERATION

Multifamily Housing (Low-Rise) (220)				
Time Period	Dwelling Unit	IN	OUT	TOTAL
AM Peak Hour	92	12	39	51
PM Peak Hour	92	38	22	60
Daily	92	333	333	665



EXHIBIT 3. VMT SCREENING (SBCTA)

EXHIBIT 4. TRIP DISTRIBUTION

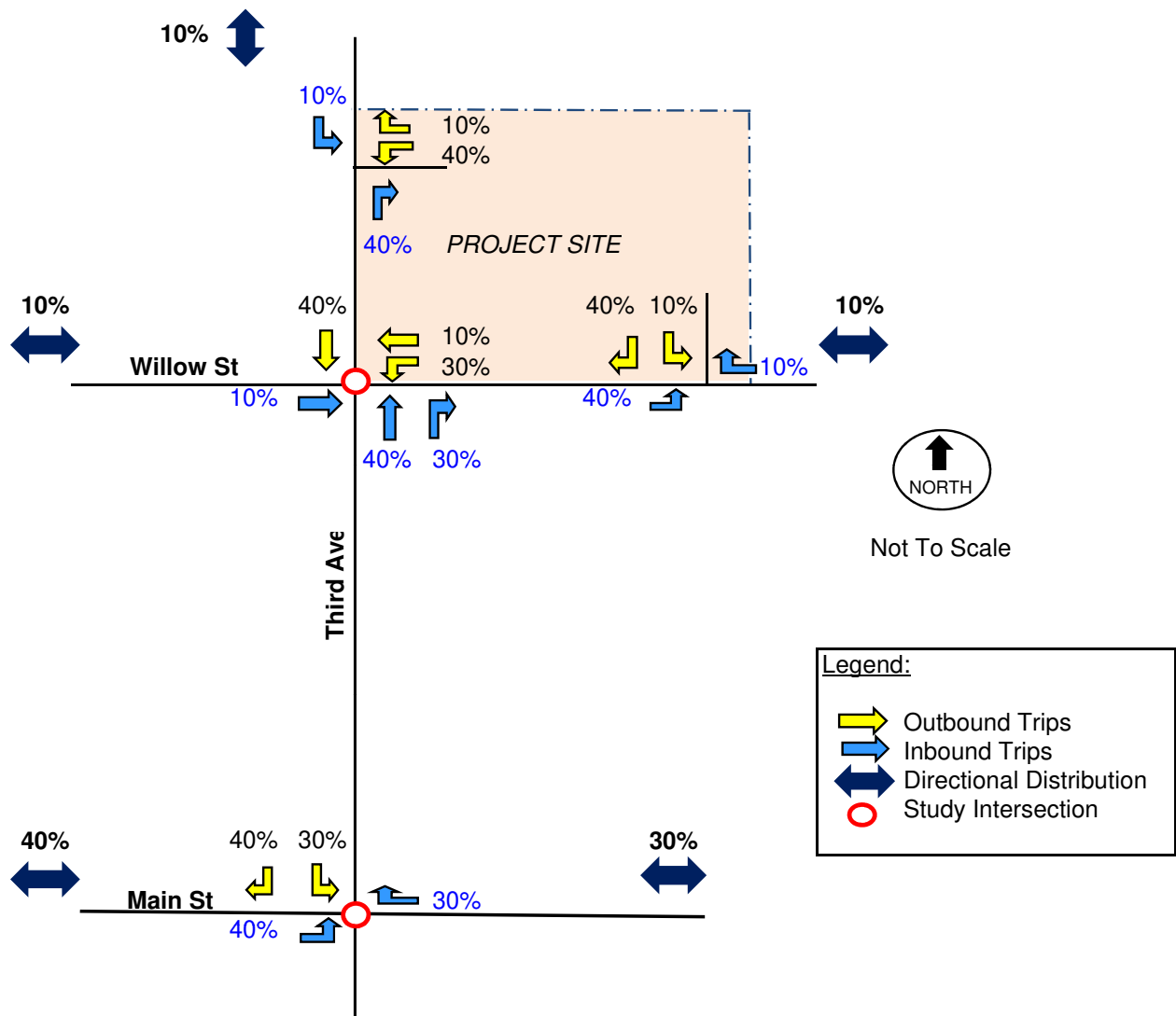


EXHIBIT 5.

A. List of Study Intersection

- 1 Third Ave at Willow St
- 2 Third Ave at Main St

B. List of Analysis Scenarios

Regional traffic growth 1.5% per year

- 1 Existing Condition
- 2 Opening Year Condition: (Existing + Growth),
- 3 Opening Year Condition + Project: (Existing + Growth + Project)
- 4 Mitigation Measure, if applicable: (Existing + Growth + Project + Mitigation Measure)

C. Phasing Approach

The project will be construction in one phase.

D. Other specific items to be addressed:

Design of Willow/Third intersection, sight distance, frontage improvements, connectivity to offsite existing improvements, etc.



frontage
improvements shall
also be discussed
and shown with
conceptual striping
as applicable.