TAB 10

Tab 10 - Traffic Impact Study by HDR Engineering

Final Traffic Impact Study

Meadow View Homes

Missoula, Montana

December 2023

PREPARED FOR:

MISSOULA, MONTANA

MEADOW VIEW HOMES SUBDIVISION
MISSOULA, MONTANA

DECEMBER 2023

PREPARED BY:

HDR ENGINEERING, INC.
700 SW HIGGINS AVE STE 200
MISSOULA, MT 59803

Table of Contents

List of Figures

List of Tables

1.0 Introduction

This report documents a Traffic Impact Study (TIS) for the proposed Meadow Views Homes subdivision project. This project is for a development of 96 residential units located in the South Hills area of Missoula, MT. This report describes the existing land uses and transportation facilities, provides the details of the accessibility and traffic projections for the proposed project, and identifies the estimated short-term quantitative traffic impacts to the surrounding area. Specifically, the report provides information on the following:

- Study area and access
- Proposed development
- Existing traffic conditions
- Trip generation, distribution, and assignment of the proposed development
- Projected traffic conditions in 2026 with and without the project
- Multimodal facilities within the vicinity of the site
- Recommendations of study area improvements

Article 3.4-J of the City of Missoula's Subdivision Regulations indicates that the City Engineer may require a traffic study if a proposed subdivision would generate 200 or more average daily trips. The project meets the trip generation requirement for a traffic study and this report documents the analysis conducted to meet that requirement.

2.0 Study Area

The proposed project is located west of Hillview Way in the southern part of Missoula, Montana. The project site will be accessed via Clearview Way at the existing Elk Hills Court and Garland Drive intersections. In addition to the proposed access locations, intersections on 39th Street, 23rd Avenue, and Hillview Way will be analyzed regarding traffic impacts for this study. The project location within South Hills is shown in **Figure 1**.

2.1 Existing Road System

At the proposed entrances to the subdivision, the intersections at Garland Drive and Clearview Way have one travel lane on each approach and have a posted speed of 25 mph. The east and west legs on Garland Drive are stop controlled at 23rd Avenue and Clearview Way is stop controlled at Hillview Way. Hillview Way has one travel lane in each direction and the posted speed is 25 mph from north of Clearview Way to the south. 23rd Avenue has one travel lane in each direction with no shoulders or sidewalks and a posted speed limit of 25 mph.

39th Street at 23rd Avenue consists of one travel lane in each direction and is controlled by traffic signals with left-turn lanes on each approach. There are sidewalks along 39th Street and the posted speed limit is 35 mph. 39th Street at Hillview Way has one travel lane in each direction and is controlled by traffic signals with right- and left-turn lanes on each approach.

The following six intersections were studied:

1. 39th Street & 23rd Avenue
2. 39th Street & Hillview Way
3. Garland Drive & 23rd Avenue
4. Clearview Way & Garland Drive
5. Clearview Way & Elk Hills Court
6. Clearview Way & Hillview Way

Source: Professional Consultants Inc., Prelim Plat 1, October 6, 2022

Figure 1: Project Location

2.2 Transit and Non-Motorized Facilities

The Mountain Line bus routes 12 and 1 run on 39th Street and 23rd Avenue, respectively. The nearest bus stop to the proposed subdivision is an existing unimproved stop in the southwest quadrant of the 23rd Avenue and Garland Drive intersection, adjacent to Garland Park. There are currently no bus routes that serve Hillview Way, Garland Drive, or Clearview Way. There are dedicated bike lanes on 39th Street and Hillview Way.

2.3 Land Uses

The Meadow Views Homes subdivision project is in an area zoned for medium density residential (see **Figure 2**). The boundaries are Hillview Way to the east, 23rd Avenue to the west, Clearview Way to the South and 39th Street to the North. Developed land to the north, south and west is medium density residential while land to the east is classified as high density residential but has yet to be developed.

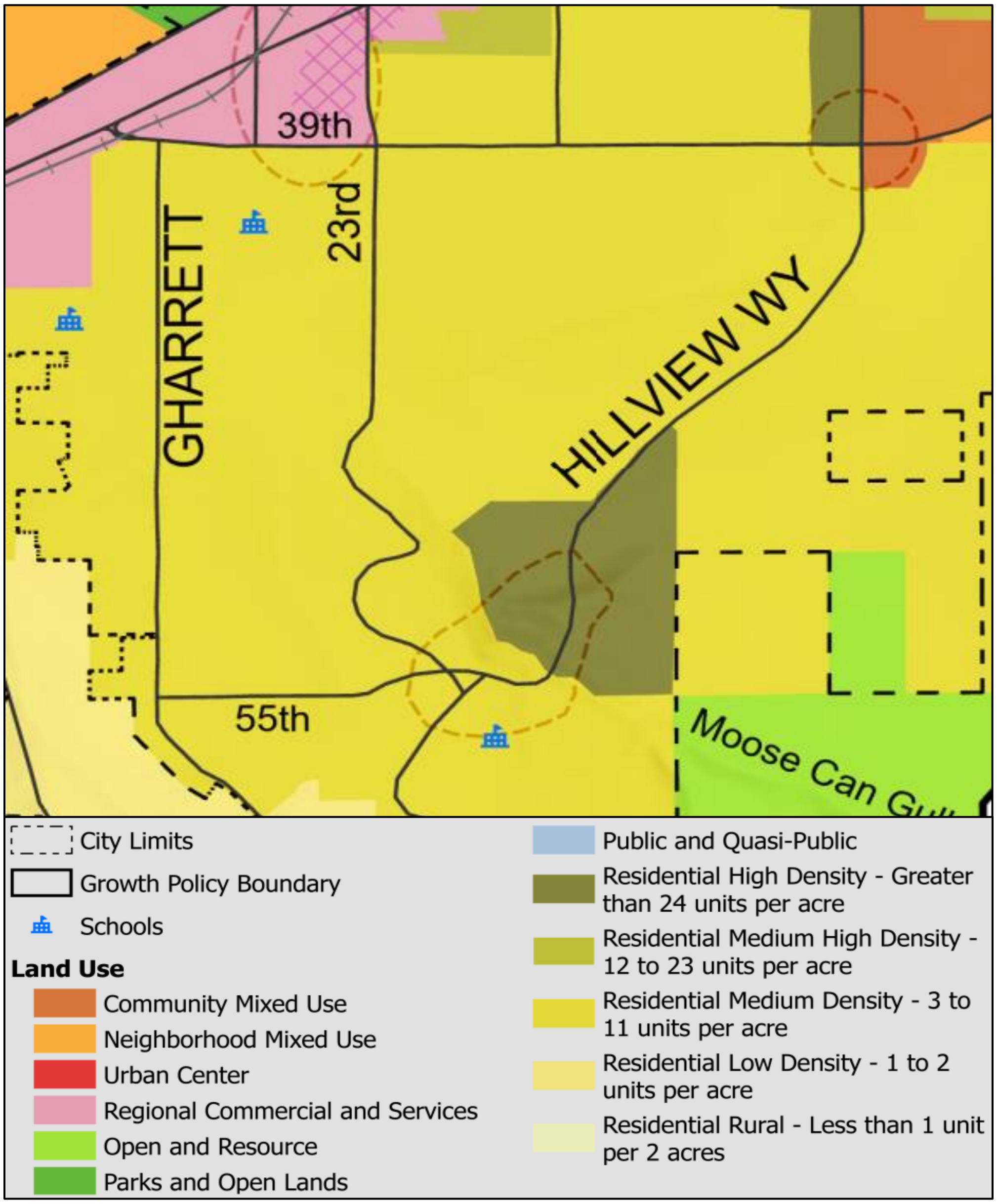


Figure 2: Missoula Urban Area Land Use Designation Map

3.0 Proposed Development

The proposed residential development is in the South Hills area of Missoula, Montana. The owner of the land proposes to develop multiple adjoining land parcels west of Hillview Way, with 96 units planned for single-family residential use. Access to the development will be accommodated along Clearview Way at the Garland Drive and Elk Hills Court intersections. Cross-connectivity to the north (via Saranac Drive) and east (via Hillview Way) was deemed infeasible due to the steep topography of the existing terrain and corresponding sight distance concerns at Hillview Way. The current subdivision site plan, provided by PCI, is shown in **Figure 3**. The project will be completed in 5 phases as shown in **Figure 4**.

Internal site circulation includes a 4-legged intersection at Elk Hills Drive and Princess Lane that is proposed as all-way stop control (AWSC). A traffic circle was also considered but was dismissed due to existing topography and impacts to the adjacent lots. The external entrances along Clearview Way will be stop-controlled. The developer is also proposing improvements to the Clearview Way and Garland Drive intersection to enhance pedestrian and bicycle safety by adding curb extensions, a crosswalk, and signage for a pedestrian crossing. The curb bulb-outs will provide a channelizing effect to reduce vehicle speeds while also providing safer pedestrian access.

The intersection improvements at Clearview Way and Garland Drive will enhance connectivity to the existing bus stop along 23rd Avenue near Garland Park. The developer is also proposing to improve the bus stop by adding a concrete pad and extending the existing sidewalk approximately 50 feet on the southwest corner of the 23rd Avenue and Garland Drive intersection. The concrete pad will be able to accommodate a future bench or shelter for riders to use and the new sidewalk will help provide access to the bus stop and enhance pedestrian access to Garland Park and the Moose Can Gully trail.

The 12-ft existing Tonkin Trail easement, to the north of the site, will be maintained. The development will be accommodating trail use by proposing multiple trail access points along Elk Hills Drive and Princess Lane.

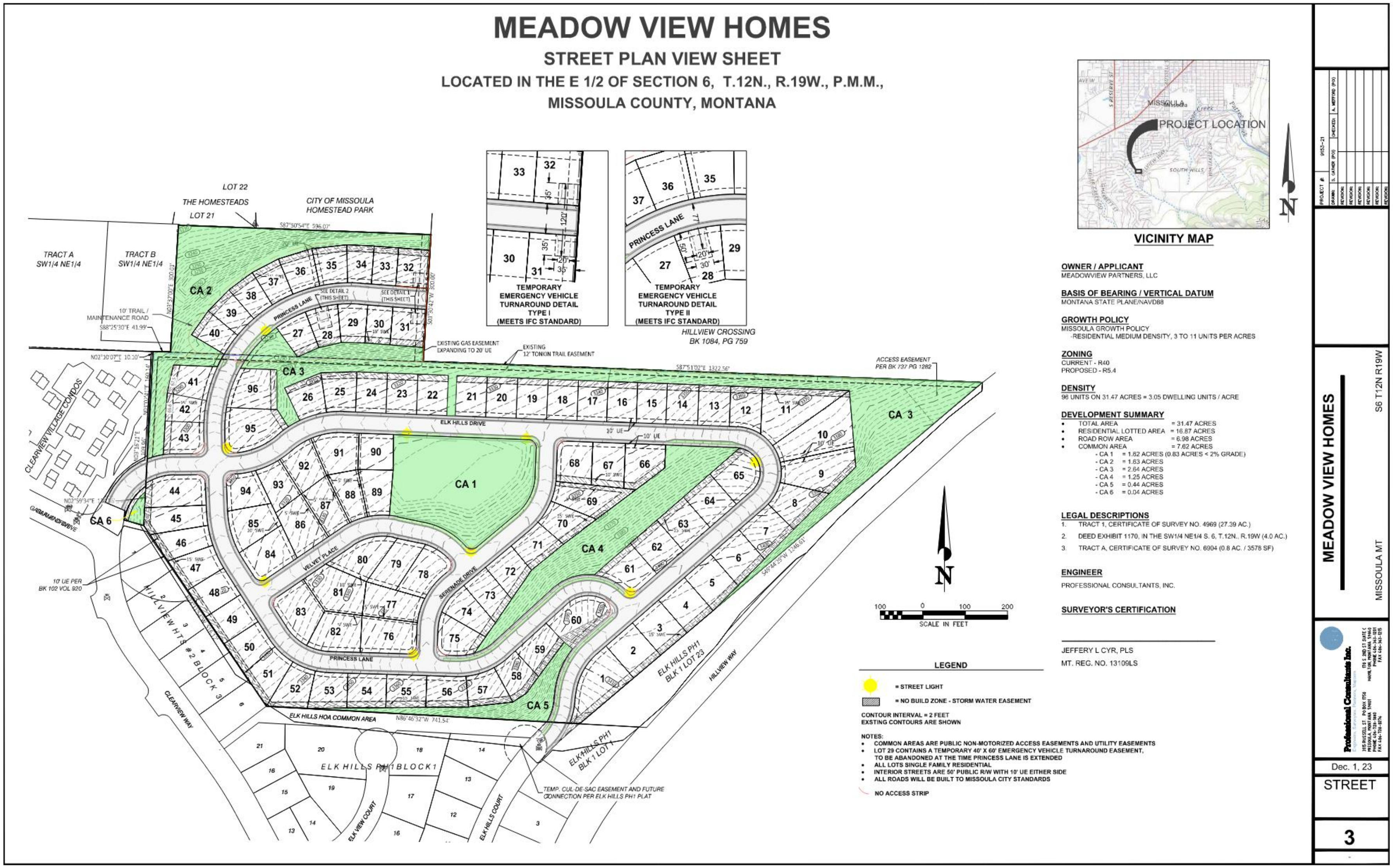


Figure 3: Meadow View Homes Preliminary Plat

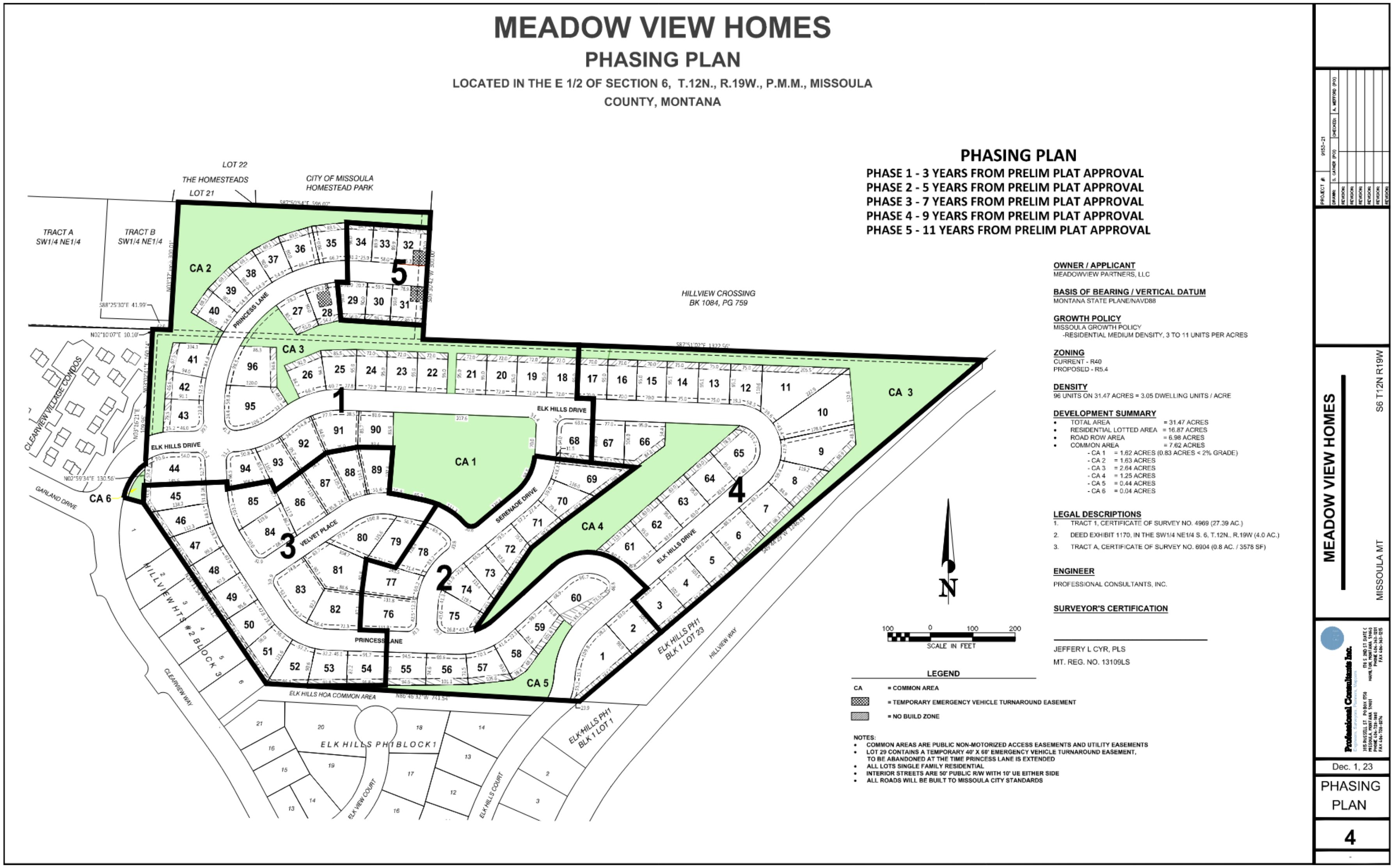


Figure 4: Meadow View Homes Phasing Plan

4.0 Existing and Background Traffic Volumes

4.1 Existing Traffic Volumes

Traffic counts were collected on Tuesday January 10, 2023, during the AM (7:00-9:00) and PM (4:00-6:00) peak periods. Peak hour intersection traffic volumes were determined for a global peak hour of 7:30-8:30 AM and 4:45-5:45 PM. A seasonal adjustment factor of 1.024 was applied to the existing counts based on data provided by the Montana Department of Transportation (MDT) for Urban Minor Arterials and Urban Collectors[1]. The seasonally adjusted existing AM and PM peak hour traffic volumes are shown in **Figure 5**.

4.2 Future Background Traffic Estimates

A three-year horizon between the existing (2023) and future (2026) analysis years represents sufficient time for the entire Meadow Views Homes project site to be developed in full, the properties to become fully occupied, and the occupants to have time to establish regular trip pattern behavior. For analysis purposes, an annual growth rate of 1 percent per year was used to develop the future "Background" peak hour traffic volume estimates that form the basis for measuring the short-term impacts of the project.

This growth rate is consistent with the short-term growth observed at the three MDT continuous count stations within Missoula, which showed growth rates of less than 1 percent at all three sites between 2012 and 2022. An adjacent subdivision east of Hillview Way is currently being constructed, but based on discussions with the City, the development will only be partially completed within the analysis period and was therefore not included in the background traffic for Meadow View. The future (2026) background intersection traffic volumes are shown in **Figure 6**.

[1]*https://www.mdt.mt.gov/other/webdata/external/Planning/seasonal_axle/2021_Two_Hose_Setup_Factors.PDF*

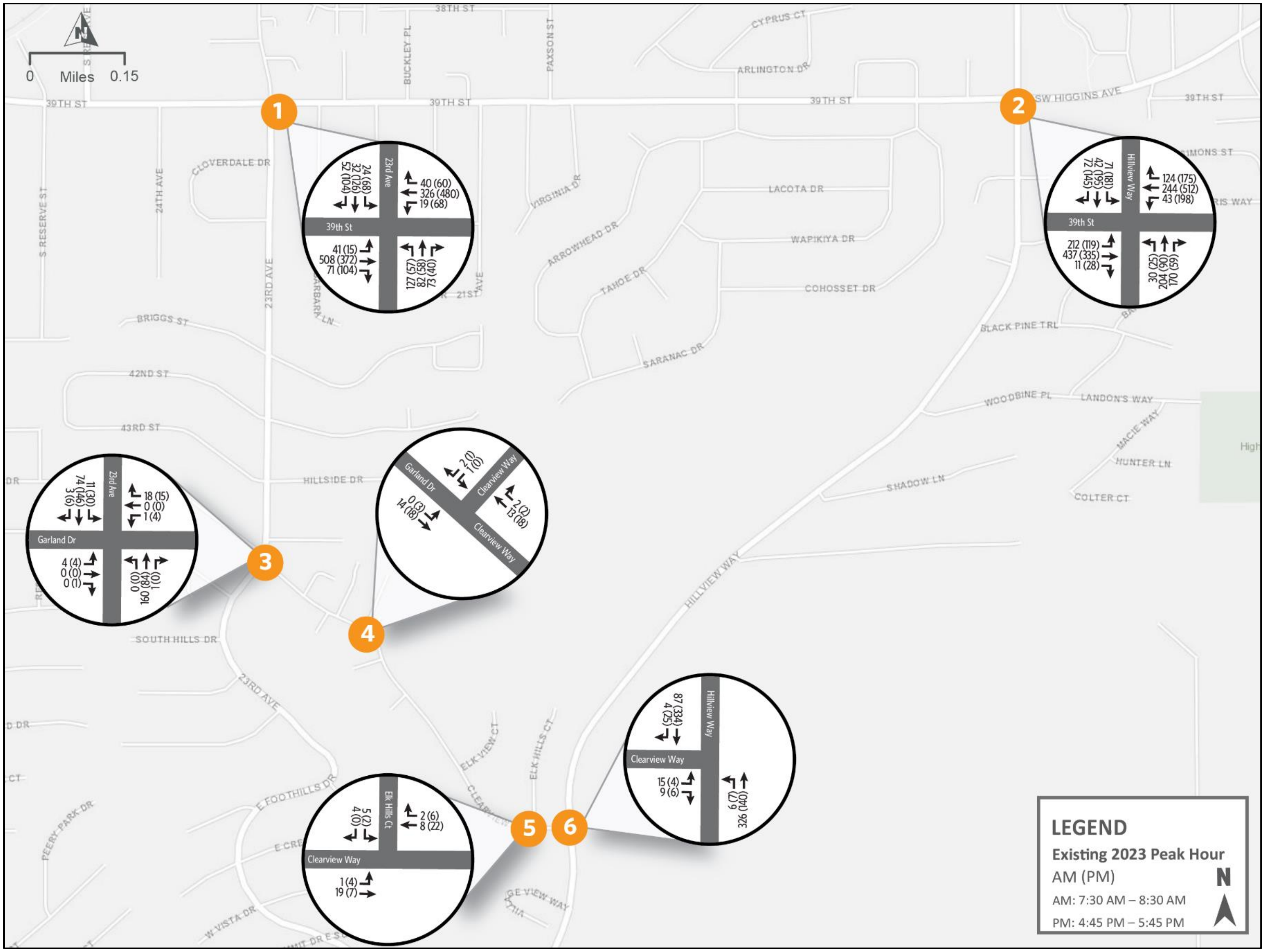


Figure 5: 2023 Existing Peak Hour Traffic Volumes

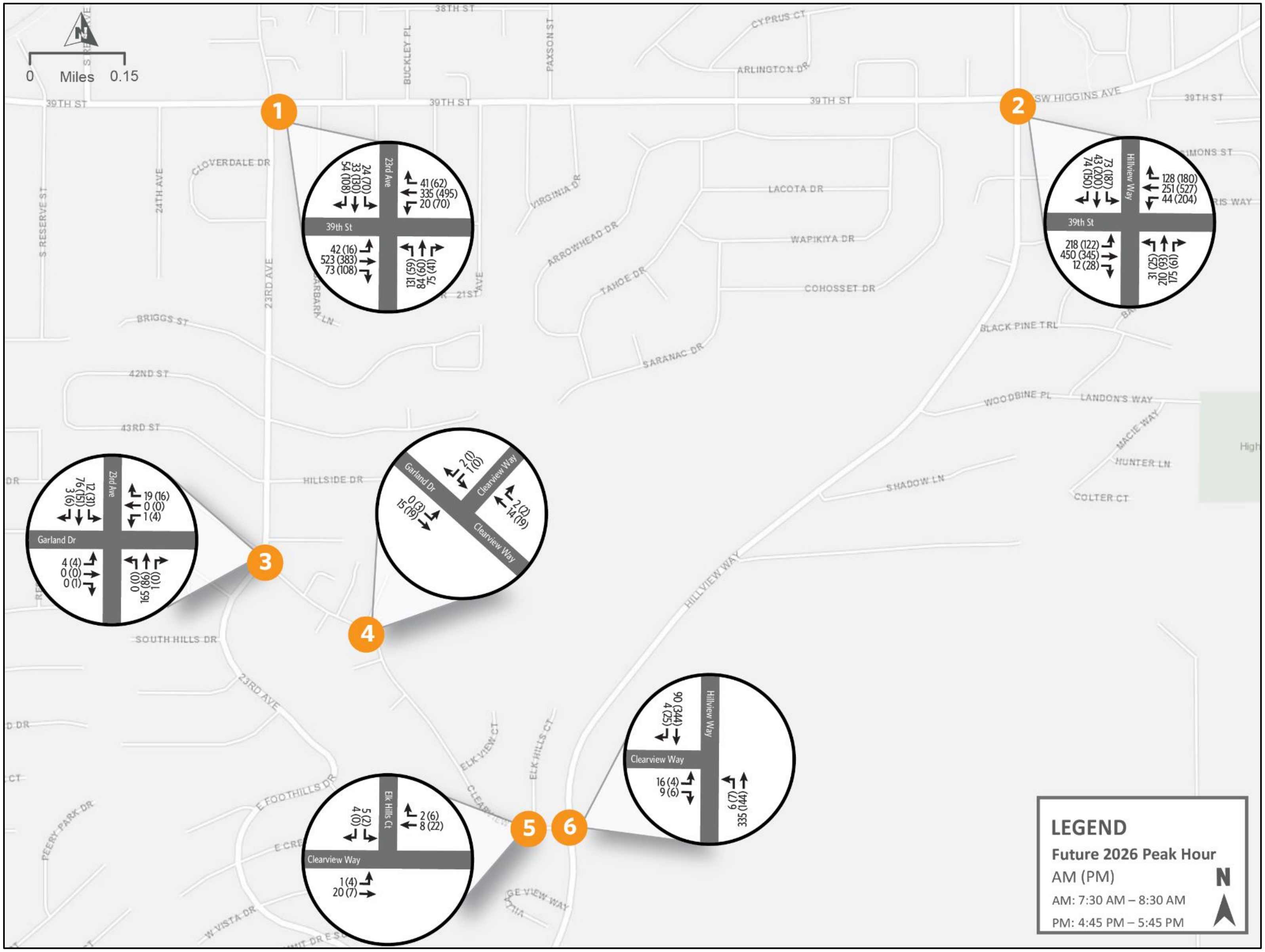


Figure 6: 2026 Background Peak Hour Traffic Volumes

5.0 Traffic Conditions with the Project

5.1 Analysis Methodology

A deterministic software model using Synchro version 11 was developed and used to assess peak hour traffic operations quality for the signalized and stop-controlled intersections. Synchro is a signal optimization and traffic operations software designed to apply the procedures described in the Highway Capacity Manual (HCM), which has been the industry standard for traffic operations analysis for over 60 years. The HCM and the Synchro software use quantitative measures of traffic flow to determine the average delay experienced by a vehicle during the peak hour and assign letter grades (Level of Service, or LOS) to roadway facilities to communicate user satisfaction. The LOS ranges from A (best) to F (worst). The HCM criteria for assigning these LOS grades to signalized and unsignalized intersections are based on delay as indicated in **Table 1**.

Table 1: Signalized and Unsignalized Intersection LOS Criteria

LOS	Delay Range (sec/veh)		Description of Conditions
	Signalized	Unsignalized	
A	0 to 10	0 to 10	Minimal delay, nearly free-flowing conditions
B	>10 to 20	>10 to 15	Low delay, queues unlikely
C	>20 to 35	>15 to 25	Low to moderate delay, short queues possible
D	>35 to 55	>25 to 35	Moderate delay, some queuing likely
E	>55 to 80	>35 to 50	High delay, long queues possible
F	>80	>50	Very unstable flow, driver behavior could be affected

Source: Highway Capacity Manual (2022)

The overall intersection delay and LOS for signalized intersections is based on the total control delay of all movements. The overall intersection delay and LOS for unsignalized intersections is based on the worst stop-controlled movement per HCM standards. The peak hour LOS standard used for this project is C (25 seconds per vehicle of delay or less for unsignalized intersections and 35 seconds per vehicle of delay or less for signalized intersections).

5.2 Trip Generation

The anticipated site-generated peak hour traffic was estimated using the average trip rate provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition for ITE Land Use code 210 – Single Family Residential. For analysis purposes, site-generated trips were estimated for the AM and PM peak hours of the adjacent street traffic, rather than the peak hour of the generator. No discounts were assumed for internal, pass-by, or diverted trips as all site-generated trips are new trips. It should be noted that the draft TIS submitted to the City for review in March 2023 included an estimated 104 residential units but the developer has since reduced this to 96 units. Based on discussions with the City the analysis discussed below assumes the original estimate of 104 units, which represents a more conservative approach for identifying potential impacts. Trip generation estimates are summarized in **Table 2**.

As shown in **Table 2**, the proposed project is estimated to generate 73 trips during the AM peak hour and 98 trips during the PM peak hour, with different percentages of entering and exiting traffic for both peak hours. The project is estimated to generate approximately 980 trips during an average weekday. Detailed trip generation information from ITE is provided in the appendix.

Table 2: Project Trip Generation

Single Family Detached		
ITE Land Use Code	210	
Dwelling Units (DU)	104	
AM Peak Hour of Adjacent Street Traffic		
Trip Rate	0.7	
Trip Total	73	
% In / % Out	25%	75%
Trips In / Out	18	55
PM Peak Hour of Adjacent Street Traffic		
Trip Rate	0.94	
Trip Total	98	
% In / % Out	63%	37%
Trips In / Out	62	36
Weekday		
Trip Rate	9.43	
Trip Total	981	
% In / % Out	50%	50%
Trips In / Out	490	490

5.3 Trip Distribution and Assignment

Project trips were assigned to the street network based on the turning movement ratios of the existing background volumes. The following assumptions, along with the low level of specific trips indicated by the trip generation estimate, drove the trip distribution for the project:

- Entering and exiting trips were split evenly between Elk Hills Court (50%) and Clearview Way/Garland Drive (50%).
- Based on existing count data along both directions of Clearview Way, it is assumed that not all entering trips will use the first entrance they can to access the development and that some trips will bypass to use the second entrance.

A schematic diagram of the AM and PM peak hour site-generated trips is shown in **Figure 7**. The 2026 peak hour traffic volume estimates with the project were derived by simply adding site-generated traffic to the 2026 Background traffic. Some single-vehicle discrepancies could exist due to rounding. A schematic diagram of the 2026 AM and PM peak hour volumes with the project is shown in **Figure 8**.

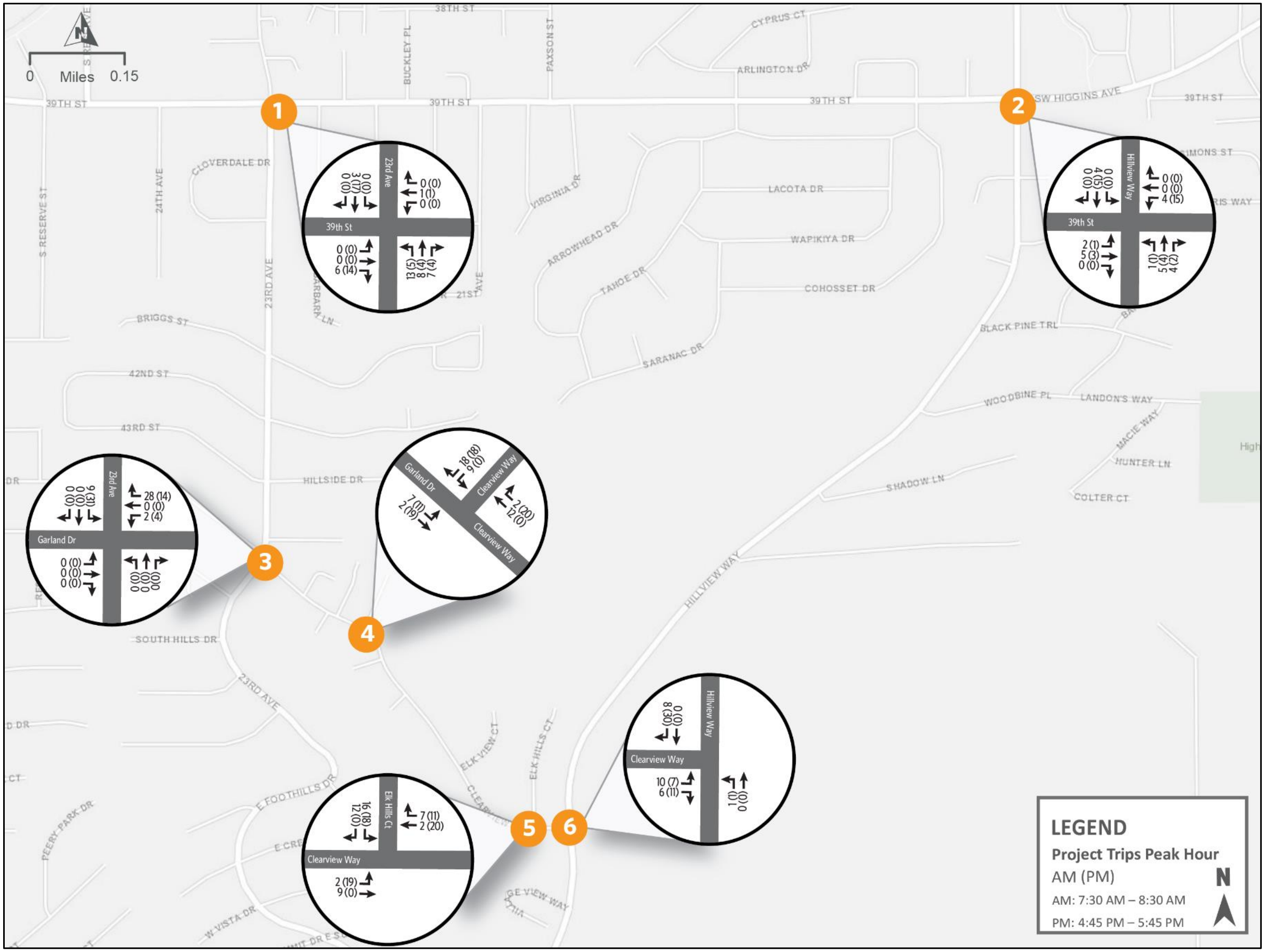


Figure 7: Peak Hour Project Trips

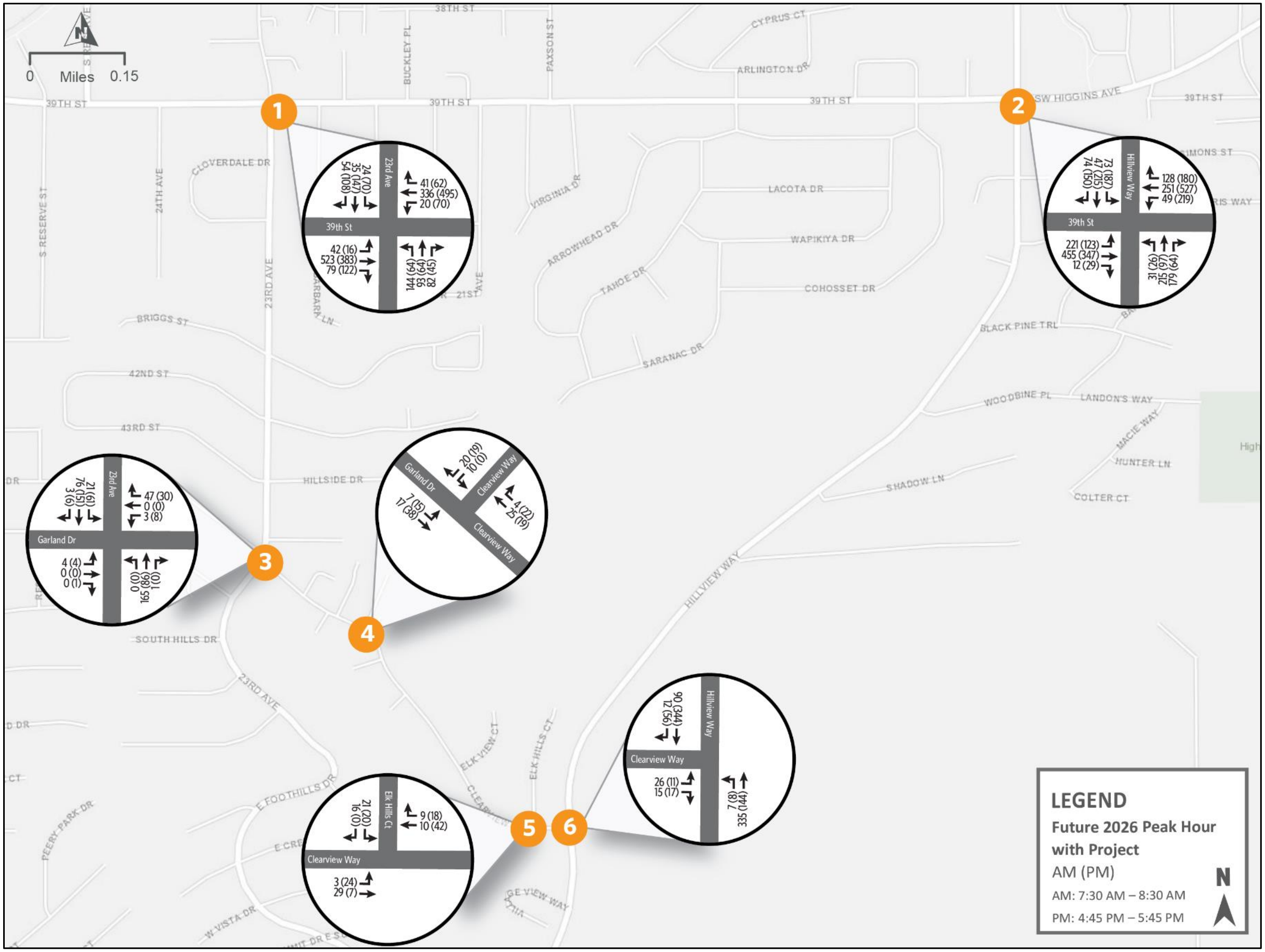


Figure 8: 2026 Peak Hour Traffic Volume Estimates with the Project

5.4 Future Conditions with the Project

A comparison of intersection LOS and delay between the "2026 Background" and "2026 With Project" scenarios is provided in **Table 3**. As previously noted, the delay and LOS for the two signalized intersections is based on the average control delay for all movements, whereas the delay and LOS for the unsignalized (or two-way stop controlled) intersections is based on the worst stop-controlled movement or approach. Detailed HCM results from Synchro are provided in the appendix to this report.

Table 3: 2026 Comparison of Background and Project LOS and Delay

Study Area Intersection	Traffic Control	2026 Background	2026 With Project
AM Peak Hour			
1. 39th St & 23rd Ave	Signal	B (19.9)	C (20.8)
2. 39th St & Hillview Way	Signal	C (28.8)	C (28.6)
3. Garland Dr & 23rd Ave	TWSC	B (10.8) – EB	B (11.5) – EB
4. Clearview Way & Garland Dr	TWSC	A (8.5) – SB	A (8.7) – SB
5. Clearview Way & Elk Hills Ct	TWSC	A (8.7) – SB	A (9.1) – SB
6. Clearview Way & Hillview Way	TWSC	B (10.8) – EB	B (11.1) – EB
PM Peak Hour			
1. 39th St & 23rd Ave	Signal	B (18.1)	B (19.1)
2. 39th St & Hillview Way	Signal	C (28.5)	C (28.6)
3. Garland Dr & 23rd Ave	TWSC	B (11.7) – EB	B (12.1) – EB
4. Clearview Way & Garland Dr	TWSC	A (8.4) – SB	A (8.8) – SB
5. Clearview Way & Elk Hills Ct	TWSC	A (8.8) – SB	A (9.8) – SB
6. Clearview Way & Hillview Way	TWSC	B (11.9) – EB	B (12.3) – EB

[1]TWSC = Two-way stop controlled. [2] Worst stop-controlled approach shown for TWSC intersections.

As shown in **Table 3**, the addition of project trips will result in satisfactory operations (LOS C or better) in the future year 2026 under the existing traffic control at all the study intersections. As previously discussed, cross-connectivity to the north (via Saranac Drive) and east (via Hillview Way) was not evaluated due to the steep terrain.

Given the relatively low volume of peak hour trips generated by the proposed development there are no anticipated impacts to bicycle and pedestrian safety or operations. The developer is proposing improvements to the Clearview Way and Garland Drive intersection to enhance pedestrian and bicycle safety by adding curb bulb-outs, a crosswalk, and signage for a pedestrian crossing.

The nearest bus stop to the proposed subdivision is an existing unimproved stop in the southwest quadrant of the 23rd Avenue and Garland Drive intersection, adjacent to Garland Park. There are no anticipated impacts to the existing Mountain Line bus routes on 39th Street and 23rd Avenue and the proposed pedestrian improvements discussed above will enhance connectivity to the existing bus stop along 23rd Avenue.

5.5 Observed and Predicted Crash Summary

As part of the TIS for the proposed Meadow View Homes subdivision, the City requested a safety evaluation for the 23rd Avenue and Garland Drive intersection. Five years of crash data was provided by MDT for the years 2017 through 2021 and was analyzed to identify crash types and severity. From 2017 to 2021, a total of 5 crashes occurred at the intersection. There were no fatalities, 1 serious injury crash, 3 property damage only crashes, and 1 unknown crash severity. The most common crash type was fixed-object crashes (80 percent), followed by a single rear-end crash (20 percent). Three crashes occurred during the winter months when the road surface was listed as wet, snow, or ice. The remaining two crashes occurred during dry conditions. A summary of the intersection crash data is provided in **Table 4**.

Table 4: 2017-2021 Observed Crash Summary

Collision Type	Crash Severity			
	Unknown	Serious Injury	Property Damage Only	Total
Rear-End	0	0	1	1
Fixed Object	1	1	2	4
Total	**1**	**1**	**3**	**5**

Based on the assumed trip distribution for the proposed project, approximately 50 percent of all entering and exiting trips will be added to the 23rd Avenue and Garland Drive intersection. A predictive crash analysis was performed using Highway Safety Manual (HSM) methodology to estimate the expected increase in crashes with the project. Using estimated average daily traffic volumes (ADT) and default values in the HSM analysis, full build-out of the proposed development is predicted to increase the number of crashes by 35 percent, or approximately 2 crashes over a 5-year period.

6.0 Conclusions and Recommendations

This report documents the analysis of the proposed Meadow Views Homes residential development within the South Hills area of Missoula, MT. It includes 96 single-family residential units with street connections to Clearview Way at Elk Hills Court and Garland Drive. The purpose of this analysis was to identify the estimated short-term quantitative traffic impacts to the surrounding area. Analysis of the study intersections indicates that within three years without the project being built, all six locations would operate at LOS C or better in both the AM and PM peak hours.

Trips generated by the project were estimated using the ITE Trip Generation manual (11th Edition) and assigned to the local street network based on existing turning movement ratios. The addition of project trips would result in LOS C or better in both peak hours at all six intersections studied. Although there are no anticipated impacts to bicycle and pedestrian safety or operations, the developer is proposing improvements to the Clearview Way and Garland Drive intersection by adding curb bulb-outs, a crosswalk, and signage for a pedestrian crossing.

There are no anticipated impacts to the existing Mountain Line bus routes on 39th Street and 23rd Avenue, but the developer is proposing to improve the existing bus stop near Garland Park by adding a concrete pad and extending the existing sidewalk approximately 50 feet on the southwest corner of the 23rd Avenue and Garland Drive intersection. The proposed pedestrian improvements near the development at the Clearview Way and Garland Drive intersection will further enhance connectivity to the existing bus stop along 23rd Avenue.

Full build-out of the proposed development is predicted to increase the number of crashes at the 23rd Avenue and Garland Drive intersection by 35 percent, or approximately 2 crashes over a 5-year period. Most of the existing crashes are single vehicle, fixed-object crashes, which indicates that speed or other roadway design elements may be contributing factors. Given the relatively low number of existing crashes (one crash per year) at this location, no additional improvements associated with the proposed development are recommended at this time.

Appendix:

ITE Trip Generation and Synchro HCM Output Details

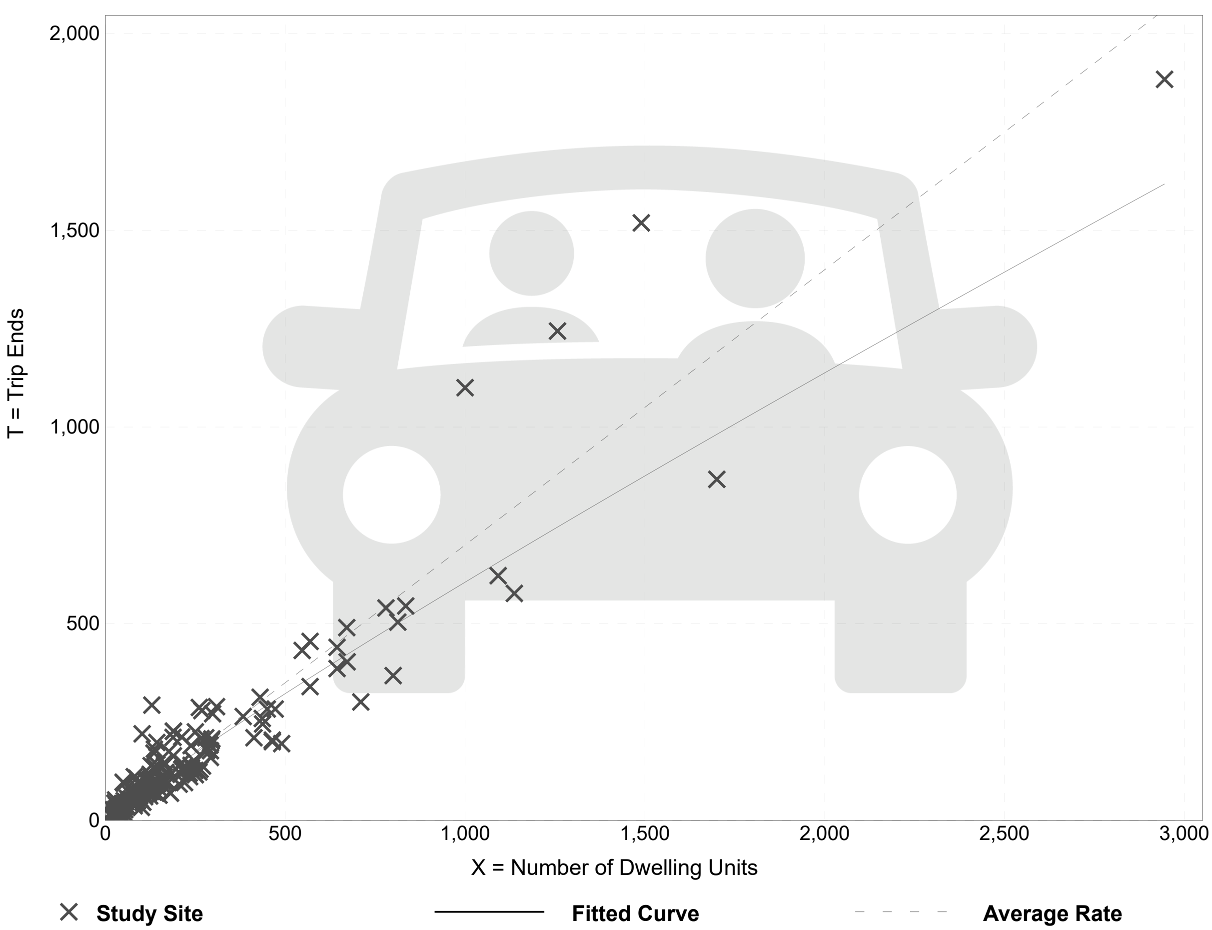
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	192
Avg. Num. of Dwelling Units:	226
Directional Distribution:	25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



Fitted Curve Equation: $Ln(T) = 0.91\ Ln(X) + 0.12$ **$R^2 = 0.90$**

Trip Gen Manual, 11th Edition • Institute of Transportation Engineers

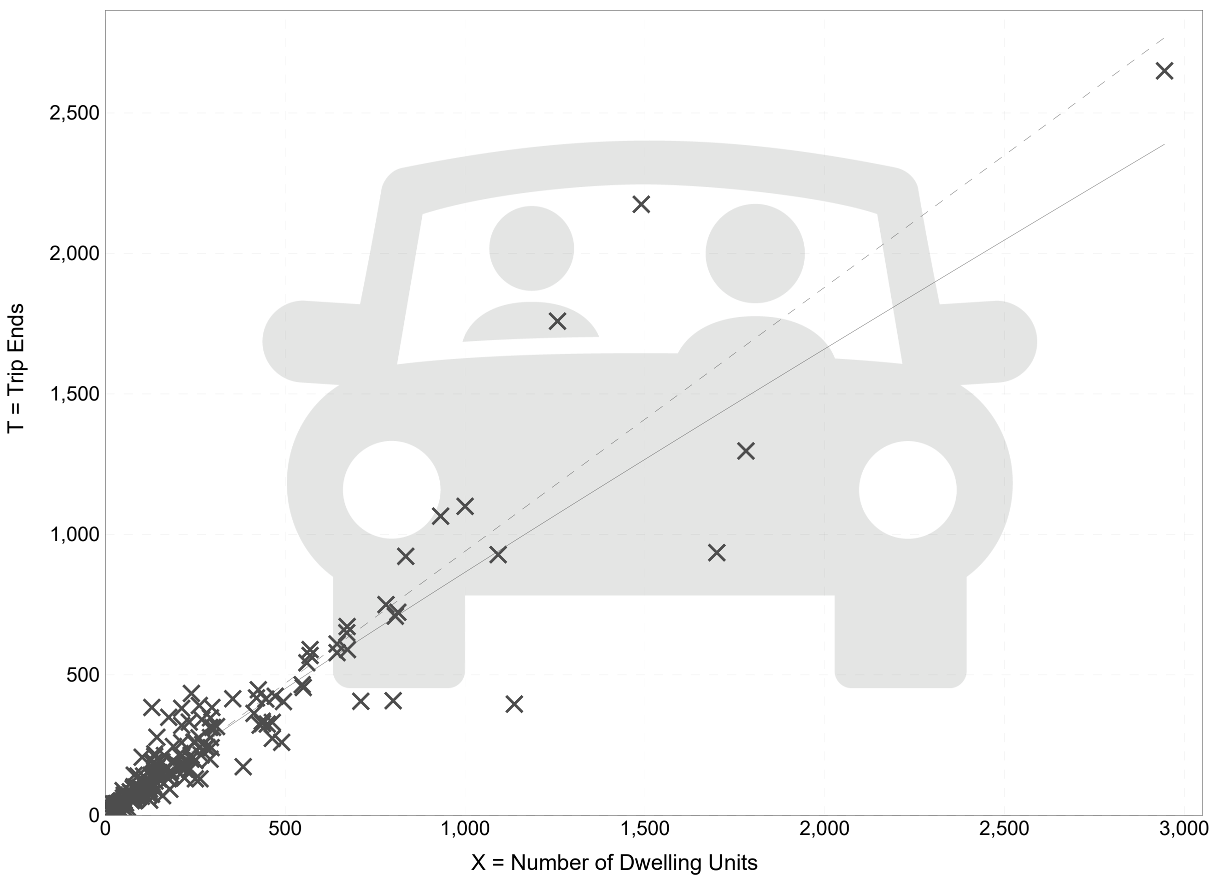
Single-Family Detached Housing
(210)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 208
Avg. Num. of Dwelling Units: 248
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.94 Ln(X) + 0.27 **R^2= 0.92**

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Single-Family Detached Housing
(210)

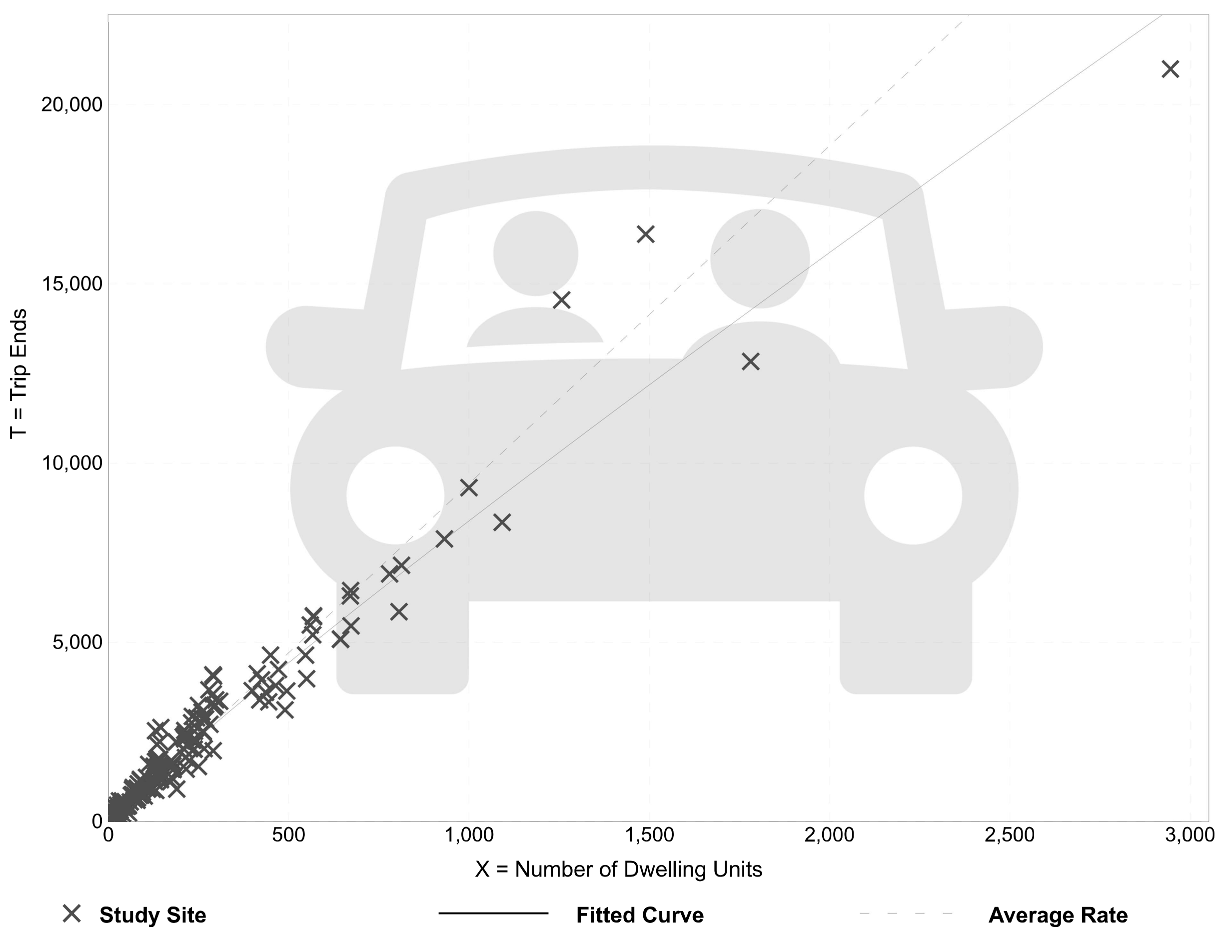
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 174
Avg. Num. of Dwelling Units: 246
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation



Fitted Curve Equation: $Ln(T) = 0.92\ Ln(X) + 2.68$ **R^2= 0.95**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	450	12	44	251	128	31	210	175	73	43	74
Future Volume (veh/h)	218	450	12	44	251	128	31	210	175	73	43	74
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	287	469	22	71	282	160	47	241	186	97	67	106
Peak Hour Factor	0.76	0.96	0.55	0.62	0.89	0.80	0.66	0.87	0.94	0.75	0.64	0.70
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	378	537	455	208	361	306	657	938	795	483	938	795
Arrive On Green	0.15	0.29	0.29	0.05	0.19	0.19	0.50	0.50	0.50	0.50	0.50	0.50
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1212	1870	1585	961	1870	1585
Grp Volume(v), veh/h	287	469	22	71	282	160	47	241	186	97	67	106
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1212	1870	1585	961	1870	1585
Q Serve(g_s), s	12.3	23.9	1.0	3.1	14.3	9.1	2.1	7.4	6.6	6.4	1.9	3.6
Cycle Q Clear(g_c), s	12.3	23.9	1.0	3.1	14.3	9.1	3.9	7.4	6.6	13.8	1.9	3.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	378	537	455	208	361	306	657	938	795	483	938	795
V/C Ratio(X)	0.76	0.87	0.05	0.34	0.78	0.52	0.07	0.26	0.23	0.20	0.07	0.13
Avail Cap(c_a), veh/h	422	860	729	223	655	555	657	938	795	483	938	795
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)	0.64	0.64	0.64	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.4	33.9	25.8	30.9	38.3	36.2	13.9	14.3	14.1	18.2	12.9	13.3
Incr Delay (d2), s/veh	4.6	4.0	0.0	1.0	3.7	1.4	0.2	0.7	0.7	0.9	0.1	0.3
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	5.5	11.0	0.4	1.4	6.8	3.6	0.6	3.1	2.4	1.5	0.8	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.0	37.9	25.8	31.8	42.0	37.6	14.1	14.9	14.8	19.2	13.0	13.7
LnGrp LOS	C	D	C	C	D	D	B	B	B	B	B	B
Approach Vol, veh/h		778			513			474			270	
Approach Delay, s/veh		35.0			39.2			14.8			15.5	
Approach LOS		C			D			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		56.1	9.1	34.7		56.1	18.6	25.3				
Change Period (Y+Rc), s		6.0	4.0	6.0		6.0	4.0	6.0				
Max Green Setting (Gmax), s		32.0	6.0	46.0		32.0	17.0	35.0				
Max Q Clear Time (g_c+I1), s		9.4	5.1	25.9		15.8	14.3	16.3				
Green Ext Time (p_c), s		2.1	0.0	2.9		1.0	0.2	2.0				
Intersection Summary												
HCM 6th Ctrl Delay			28.8									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	523	73	20	335	41	131	84	75	24	33	54
Future Volume (veh/h)	42	523	73	20	335	41	131	84	75	24	33	54
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	58	608	85	28	399	63	144	101	109	43	42	64
Peak Hour Factor	0.73	0.86	0.86	0.71	0.84	0.65	0.91	0.83	0.69	0.56	0.78	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	644	987	138	107	1127	178	254	161	173	169	131	199
Arrive On Green	0.61	0.61	0.61	0.06	0.71	0.71	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	930	1606	224	1781	1577	249	1288	823	888	1172	668	1019
Grp Volume(v), veh/h	58	0	693	28	0	462	144	0	210	43	0	106
Grp Sat Flow(s),veh/h/ln	930	0	1830	1781	0	1826	1288	0	1711	1172	0	1687
Q Serve(g_s), s	2.6	0.0	23.5	1.5	0.0	9.7	10.8	0.0	11.3	3.5	0.0	5.4
Cycle Q Clear(g_c), s	2.6	0.0	23.5	1.5	0.0	9.7	16.2	0.0	11.3	14.8	0.0	5.4
Prop In Lane	1.00		0.12	1.00		0.14	1.00		0.52	1.00		0.60
Lane Grp Cap(c), veh/h	644	0	1125	107	0	1305	254	0	334	169	0	330
V/C Ratio(X)	0.09	0.00	0.62	0.26	0.00	0.35	0.57	0.00	0.63	0.25	0.00	0.32
Avail Cap(c_a), veh/h	644	0	1125	107	0	1305	376	0	496	280	0	489
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	0.00	1.00	0.86	0.00	0.86	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.9	0.0	11.9	44.9	0.0	5.5	41.5	0.0	36.9	43.7	0.0	34.5
Incr Delay (d2), s/veh	0.3	0.0	2.5	5.1	0.0	0.6	2.0	0.0	1.9	0.8	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	9.3	0.8	0.0	3.2	3.6	0.0	4.9	1.1	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.2	0.0	14.5	49.9	0.0	6.1	43.5	0.0	38.9	44.5	0.0	35.1
LnGrp LOS	A	A	B	D	A	A	D	A	D	D	A	D
Approach Vol, veh/h		751			490			354			149	
Approach Delay, s/veh		14.0			8.6			40.7			37.8	
Approach LOS		B			A			D			D	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.0	66.5		23.5		76.5		23.5				
Change Period (Y+Rc), s	4.0	* 5		4.0		* 5		4.0				
Max Green Setting (Gmax), s	6.0	* 52		29.0		* 62		29.0				
Max Q Clear Time (g_c+I1), s	3.5	25.5		16.8		11.7		18.2				
Green Ext Time (p_c), s	0.0	5.5		0.5		3.2		1.3				
Intersection Summary												
HCM 6th Ctrl Delay			19.9									
HCM 6th LOS			B									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	9	6	335	90	4
Future Vol, veh/h	16	9	6	335	90	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	38	50	85	81	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	24	12	394	111	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	529	111	116	0	-	0
Stage 1	111	-	-	-	-	-
Stage 2	418	-	-	-	-	-
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	510	942	1473	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	505	942	1473	-	-	-
Mov Cap-2 Maneuver	505	-	-	-	-	-
Stage 1	905	-	-	-	-	-
Stage 2	664	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1473	-	668	-	-
HCM Lane V/C Ratio	0.008	-	0.067	-	-
HCM Control Delay (s)	7.5	0	10.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	0	0	1	0	19	0	165	1	12	76	3
Future Vol, veh/h	4	0	0	1	0	19	0	165	1	12	76	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	75	75	75	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	0	0	1	0	25	0	179	1	13	83	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	303	291	85	291	292	180	86	0	0	180	0	0
Stage 1	111	111	-	180	180	-	-	-	-	-	-	-
Stage 2	192	180	-	111	112	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	649	619	974	661	619	863	1510	-	-	1396	-	-
Stage 1	894	804	-	822	750	-	-	-	-	-	-	-
Stage 2	810	750	-	894	803	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	625	613	974	656	613	863	1510	-	-	1396	-	-
Mov Cap-2 Maneuver	625	613	-	656	613	-	-	-	-	-	-	-
Stage 1	894	796	-	822	750	-	-	-	-	-	-	-
Stage 2	786	750	-	885	795	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.8	9.4	0	1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1510	-	-	625	850	1396	-	-
HCM Lane V/C Ratio	-	-	-	0.007	0.031	0.009	-	-
HCM Control Delay (s)	0	-	-	10.8	9.4	7.6	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	20	8	2	5	4
Future Vol, veh/h	1	20	8	2	5	4
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	25	48	50	50	63	50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	42	16	4	8	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	20	0	-	0	68	18
Stage 1	-	-	-	-	18	-
Stage 2	-	-	-	-	50	-
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	1596	-	-	-	937	1061
Stage 1	-	-	-	-	1005	-
Stage 2	-	-	-	-	972	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1596	-	-	-	934	1061
Mov Cap-2 Maneuver	-	-	-	-	934	-
Stage 1	-	-	-	-	1002	-
Stage 2	-	-	-	-	972	-

Approach	EB		WB		SB	
HCM Control Delay, s	0.6		0		8.7	
HCM LOS					A	

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1596	-	-	-	994
HCM Lane V/C Ratio	0.003	-	-	-	0.016
HCM Control Delay (s)	7.3	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	15	14	2	0	2
Future Vol, veh/h	0	15	14	2	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	25	70	54	50	25	50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	21	26	4	0	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	30	0	-	0	49	28
Stage 1	-	-	-	-	28	-
Stage 2	-	-	-	-	21	-
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	1583	-	-	-	960	1047
Stage 1	-	-	-	-	995	-
Stage 2	-	-	-	-	1002	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1583	-	-	-	960	1047
Mov Cap-2 Maneuver	-	-	-	-	960	-
Stage 1	-	-	-	-	995	-
Stage 2	-	-	-	-	1002	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1583	-	-	-	1047
HCM Lane V/C Ratio	-	-	-	-	0.004
HCM Control Delay (s)	0	-	-	-	8.5
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	345	28	204	527	180	25	93	61	187	200	150
Future Volume (veh/h)	122	345	28	204	527	180	25	93	61	187	200	150
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	1900	1900	1900	1885	1900	1900	1870	1885	1900	1885
Adj Flow Rate, veh/h	133	375	48	237	693	198	42	109	77	208	250	176
Peak Hour Factor	0.92	0.92	0.58	0.86	0.76	0.91	0.60	0.85	0.79	0.90	0.80	0.85
Percent Heavy Veh, %	2	2	0	0	0	1	0	0	2	1	0	1
Cap, veh/h	224	685	589	455	758	638	345	712	594	478	712	598
Arrive On Green	0.07	0.37	0.37	0.10	0.40	0.40	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	1781	1870	1610	1810	1900	1598	977	1900	1585	1207	1900	1598
Grp Volume(v), veh/h	133	375	48	237	693	198	42	109	77	208	250	176
Grp Sat Flow(s),veh/h/ln	1781	1870	1610	1810	1900	1598	977	1900	1585	1207	1900	1598
Q Serve(g_s), s	4.6	15.9	1.9	7.9	34.5	8.5	3.2	3.8	3.2	13.8	9.5	7.7
Cycle Q Clear(g_c), s	4.6	15.9	1.9	7.9	34.5	8.5	12.7	3.8	3.2	17.6	9.5	7.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	224	685	589	455	758	638	345	712	594	478	712	598
V/C Ratio(X)	0.59	0.55	0.08	0.52	0.91	0.31	0.12	0.15	0.13	0.43	0.35	0.29
Avail Cap(c_a), veh/h	248	786	676	474	855	719	345	712	594	478	712	598
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)	0.72	0.72	0.72	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.4	25.1	20.7	17.6	28.4	20.6	27.1	20.7	20.6	26.6	22.5	22.0
Incr Delay (d2), s/veh	2.3	0.5	0.0	0.9	13.2	0.3	0.7	0.5	0.5	2.9	1.4	1.2
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	2.0	6.9	0.7	3.2	17.6	3.1	0.8	1.7	1.2	4.2	4.4	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.7	25.6	20.8	18.5	41.6	20.9	27.8	21.2	21.0	29.5	23.9	23.2
LnGrp LOS	C	C	C	B	D	C	C	C	C	C	C	C
Approach Vol, veh/h		556			1128			228			634	
Approach Delay, s/veh		25.2			33.1			22.4			25.5	
Approach LOS		C			C			C			C	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		43.5	13.9	42.6		43.5	10.6	45.9				
Change Period (Y+Rc), s		6.0	4.0	6.0		6.0	4.0	6.0				
Max Green Setting (Gmax), s		31.0	11.0	42.0		31.0	8.0	45.0				
Max Q Clear Time (g_c+I1), s		14.7	9.9	17.9		19.6	6.6	36.5				
Green Ext Time (p_c), s		0.9	0.1	2.4		2.2	0.0	3.4				
Intersection Summary												
HCM 6th Ctrl Delay			28.5									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	383	108	70	495	62	59	60	41	70	130	108
Future Volume (veh/h)	16	383	108	70	495	62	59	60	41	70	130	108
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	1781	1885	1885	1870	1885	1900	1900	1900	1811	1900	1885	1811
Adj Flow Rate, veh/h	24	416	121	73	611	84	72	67	51	76	200	123
Peak Hour Factor	0.67	0.92	0.89	0.96	0.81	0.74	0.82	0.89	0.81	0.92	0.65	0.88
Percent Heavy Veh, %	8	1	1	2	1	0	0	0	6	0	1	6
Cap, veh/h	368	653	190	153	987	136	208	263	200	375	287	177
Arrive On Green	0.47	0.47	0.47	0.09	0.61	0.61	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	714	1403	408	1781	1622	223	1074	1001	762	1294	1092	672
Grp Volume(v), veh/h	24	0	537	73	0	695	72	0	118	76	0	323
Grp Sat Flow(s),veh/h/ln	714	0	1812	1781	0	1845	1074	0	1763	1294	0	1764
Q Serve(g_s), s	1.5	0.0	15.8	2.7	0.0	16.6	4.5	0.0	3.7	3.4	0.0	11.6
Cycle Q Clear(g_c), s	8.1	0.0	15.8	2.7	0.0	16.6	16.1	0.0	3.7	7.2	0.0	11.6
Prop In Lane	1.00		0.23	1.00		0.12	1.00		0.43	1.00		0.38
Lane Grp Cap(c), veh/h	368	0	843	153	0	1123	208	0	464	375	0	464
V/C Ratio(X)	0.07	0.00	0.64	0.48	0.00	0.62	0.35	0.00	0.25	0.20	0.00	0.70
Avail Cap(c_a), veh/h	368	0	843	153	0	1123	263	0	554	441	0	554
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	0.00	1.00	0.61	0.00	0.61	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	14.3	0.0	14.2	30.5	0.0	8.6	30.5	0.0	20.4	23.2	0.0	23.3
Incr Delay (d2), s/veh	0.3	0.0	3.7	6.4	0.0	1.6	1.0	0.0	0.3	0.3	0.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	6.4	1.4	0.0	5.5	1.2	0.0	1.5	1.1	0.0	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.6	0.0	17.9	36.9	0.0	10.2	31.5	0.0	20.7	23.5	0.0	26.3
LnGrp LOS	B	A	B	D	A	B	C	A	C	C	A	C
Approach Vol, veh/h		561			768			190			399	
Approach Delay, s/veh		17.7			12.7			24.8			25.7	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.0	37.6		22.4		47.6		22.4				
Change Period (Y+Rc), s	4.0	* 5		4.0		* 5		4.0				
Max Green Setting (Gmax), s	6.0	* 29		22.0		* 39		22.0				
Max Q Clear Time (g_c+I1), s	4.7	17.8		13.6		18.6		18.1				
Green Ext Time (p_c), s	0.0	2.8		1.5		4.8		0.3				
Intersection Summary												
HCM 6th Ctrl Delay			18.1									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	0.5					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	6	7	144	344	25
Future Vol, veh/h	4	6	7	144	344	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	44	88	56	86	87	100
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	9	7	13	167	395	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	586	395	420	0	-	0
Stage 1	395	-	-	-	-	-
Stage 2	191	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	476	659	1150	-	-	-
Stage 1	685	-	-	-	-	-
Stage 2	846	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	470	659	1150	-	-	-
Mov Cap-2 Maneuver	470	-	-	-	-	-
Stage 1	677	-	-	-	-	-
Stage 2	846	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.9	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1150	-	536	-	-
HCM Lane V/C Ratio	0.011	-	0.03	-	-
HCM Control Delay (s)	8.2	0	11.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	0	0	4	0	16	0	86	0	31	151	6
Future Vol, veh/h	4	0	0	4	0	16	0	86	0	31	151	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	25	25	42	25	53	25	89	25	73	84	50
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	0	0
Mvmt Flow	10	0	0	10	0	30	0	97	0	42	180	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	382	367	186	367	373	97	192	0	0	97	0	0
Stage 1	270	270	-	97	97	-	-	-	-	-	-	-
Stage 2	112	97	-	270	276	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	580	565	861	593	561	965	1394	-	-	1509	-	-
Stage 1	740	690	-	914	819	-	-	-	-	-	-	-
Stage 2	898	819	-	740	685	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	549	547	861	579	544	965	1394	-	-	1509	-	-
Mov Cap-2 Maneuver	549	547	-	579	544	-	-	-	-	-	-	-
Stage 1	740	669	-	914	819	-	-	-	-	-	-	-
Stage 2	870	819	-	717	664	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.7	9.5	0	1.4
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1394	-	-	549	832	1509	-	-
HCM Lane V/C Ratio	-	-	-	0.017	0.048	0.028	-	-
HCM Control Delay (s)	0	-	-	11.7	9.5	7.5	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0.1	-	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	7	22	6	2	0
Future Vol, veh/h	4	7	22	6	2	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	69	82	50	50	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	8	10	27	12	4	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	39	0	-	0	59	33
Stage 1	-	-	-	-	33	-
Stage 2	-	-	-	-	26	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1584	-	-	-	953	1046
Stage 1	-	-	-	-	995	-
Stage 2	-	-	-	-	1002	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1584	-	-	-	948	1046
Mov Cap-2 Maneuver	-	-	-	-	948	-
Stage 1	-	-	-	-	990	-
Stage 2	-	-	-	-	1002	-

Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1584	-	-	-	948
HCM Lane V/C Ratio	0.005	-	-	-	0.004
HCM Control Delay (s)	7.3	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	19	19	2	0	1
Future Vol, veh/h	3	19	19	2	0	1
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	75	75	63	75	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	4	25	30	3	0	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	33	0	-	0	65	32
Stage 1	-	-	-	-	32	-
Stage 2	-	-	-	-	33	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1592	-	-	-	946	1048
Stage 1	-	-	-	-	996	-
Stage 2	-	-	-	-	995	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1592	-	-	-	943	1048
Mov Cap-2 Maneuver	-	-	-	-	943	-
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	995	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	8.4
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1592	-	-	-	1048
HCM Lane V/C Ratio	0.003	-	-	-	0.004
HCM Control Delay (s)	7.3	0	-	-	8.4
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	221	455	12	49	251	128	31	215	179	73	47	74
Future Volume (veh/h)	221	455	12	49	251	128	31	215	179	73	47	74
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	291	474	22	79	282	160	47	247	190	97	73	106
Peak Hour Factor	0.76	0.96	0.55	0.62	0.89	0.80	0.66	0.87	0.94	0.75	0.64	0.70
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	386	542	459	213	371	314	644	927	785	470	927	785
Arrive On Green	0.15	0.29	0.29	0.05	0.20	0.20	0.50	0.50	0.50	0.50	0.50	0.50
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1205	1870	1585	952	1870	1585
Grp Volume(v), veh/h	291	474	22	79	282	160	47	247	190	97	73	106
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1205	1870	1585	952	1870	1585
Q Serve(g_s), s	12.4	24.1	1.0	3.5	14.2	9.0	2.1	7.7	6.9	6.6	2.0	3.6
Cycle Q Clear(g_c), s	12.4	24.1	1.0	3.5	14.2	9.0	4.2	7.7	6.9	14.3	2.0	3.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	386	542	459	213	371	314	644	927	785	470	927	785
V/C Ratio(X)	0.75	0.87	0.05	0.37	0.76	0.51	0.07	0.27	0.24	0.21	0.08	0.13
Avail Cap(c_a), veh/h	428	860	729	223	655	555	644	927	785	470	927	785
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)	0.63	0.63	0.63	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.0	33.8	25.6	30.4	37.9	35.8	14.3	14.7	14.5	18.8	13.2	13.6
Incr Delay (d2), s/veh	4.3	4.0	0.0	1.1	3.2	1.3	0.2	0.7	0.7	1.0	0.2	0.4
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	5.5	11.2	0.4	1.5	6.7	3.5	0.6	3.3	2.5	1.5	0.9	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.3	37.8	25.6	31.5	41.1	37.0	14.6	15.4	15.2	19.8	13.4	14.0
LnGrp LOS	C	D	C	C	D	D	B	B	B	B	B	B
Approach Vol, veh/h		787			521			484			276	
Approach Delay, s/veh		34.7			38.4			15.2			15.9	
Approach LOS		C			D			B			B	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		55.5	9.5	35.0		55.5	18.6	25.8				
Change Period (Y+Rc), s		6.0	4.0	6.0		6.0	4.0	6.0				
Max Green Setting (Gmax), s		32.0	6.0	46.0		32.0	17.0	35.0				
Max Q Clear Time (g_c+I1), s		9.7	5.5	26.1		16.3	14.4	16.2				
Green Ext Time (p_c), s		2.2	0.0	2.9		1.0	0.2	2.0				
Intersection Summary												
HCM 6th Ctrl Delay			28.6									
HCM 6th LOS			C									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	523	79	20	336	41	144	93	82	24	35	54
Future Volume (veh/h)	42	523	79	20	336	41	144	93	82	24	35	54
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	58	608	92	28	400	63	158	112	119	43	45	64
Peak Hour Factor	0.73	0.86	0.86	0.71	0.84	0.65	0.91	0.83	0.69	0.56	0.78	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	631	956	145	107	1108	175	268	172	183	168	145	206
Arrive On Green	0.60	0.60	0.60	0.06	0.70	0.70	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	929	1587	240	1781	1577	248	1284	830	882	1149	698	993
Grp Volume(v), veh/h	58	0	700	28	0	463	158	0	231	43	0	109
Grp Sat Flow(s),veh/h/ln	929	0	1827	1781	0	1826	1284	0	1712	1149	0	1692
Q Serve(g_s), s	2.7	0.0	24.7	1.5	0.0	10.1	11.9	0.0	12.4	3.6	0.0	5.5
Cycle Q Clear(g_c), s	2.8	0.0	24.7	1.5	0.0	10.1	17.3	0.0	12.4	15.9	0.0	5.5
Prop In Lane	1.00		0.13	1.00		0.14	1.00		0.52	1.00		0.59
Lane Grp Cap(c), veh/h	631	0	1101	107	0	1283	268	0	355	168	0	351
V/C Ratio(X)	0.09	0.00	0.64	0.26	0.00	0.36	0.59	0.00	0.65	0.26	0.00	0.31
Avail Cap(c_a), veh/h	631	0	1101	107	0	1283	374	0	496	263	0	491
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	0.00	1.00	0.87	0.00	0.87	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.5	0.0	12.8	44.9	0.0	5.9	40.9	0.0	36.3	43.6	0.0	33.6
Incr Delay (d2), s/veh	0.3	0.0	2.8	5.1	0.0	0.7	2.1	0.0	2.0	0.8	0.0	0.5
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	0.5	0.0	9.9	0.8	0.0	3.4	3.9	0.0	5.4	1.1	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.8	0.0	15.6	50.0	0.0	6.6	43.0	0.0	38.3	44.4	0.0	34.1
LnGrp LOS	A	A	B	D	A	A	D	A	D	D	A	C
Approach Vol, veh/h		758			491			389			152	
Approach Delay, s/veh		15.1			9.1			40.2			37.0	
Approach LOS		B			A			D			D	

Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.0	65.3		24.7		75.3		24.7				
Change Period (Y+Rc), s	4.0	* 5		4.0		* 5		4.0				
Max Green Setting (Gmax), s	6.0	* 52		29.0		* 62		29.0				
Max Q Clear Time (g_c+I1), s	3.5	26.7		17.9		12.1		19.3				
Green Ext Time (p_c), s	0.0	5.5		0.5		3.2		1.4				

Intersection Summary			
HCM 6th Ctrl Delay			20.8
HCM 6th LOS			C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	1.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	26	15	7	335	90	12
Future Vol, veh/h	26	15	7	335	90	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	38	50	85	81	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	39	14	394	111	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	533	111	125	0	-	0
Stage 1	111	-	-	-	-	-
Stage 2	422	-	-	-	-	-
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	507	942	1462	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	662	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	501	942	1462	-	-	-
Mov Cap-2 Maneuver	501	-	-	-	-	-
Stage 1	903	-	-	-	-	-
Stage 2	662	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1462	-	667	-	-
HCM Lane V/C Ratio	0.01	-	0.111	-	-
HCM Control Delay (s)	7.5	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	0	0	3	0	47	0	165	1	21	76	3
Future Vol, veh/h	4	0	0	3	0	47	0	165	1	21	76	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	75	75	75	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	0	0	4	0	63	0	179	1	23	83	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	342	311	85	311	312	180	86	0	0	180	0	0
Stage 1	131	131	-	180	180	-	-	-	-	-	-	-
Stage 2	211	180	-	131	132	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	612	604	974	642	603	863	1510	-	-	1396	-	-
Stage 1	873	788	-	822	750	-	-	-	-	-	-	-
Stage 2	791	750	-	873	787	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	560	594	974	634	593	863	1510	-	-	1396	-	-
Mov Cap-2 Maneuver	560	594	-	634	593	-	-	-	-	-	-	-
Stage 1	873	775	-	822	750	-	-	-	-	-	-	-
Stage 2	734	750	-	858	774	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.5	9.6	0	1.6
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1510	-	-	560	845	1396	-	-
HCM Lane V/C Ratio	-	-	-	0.008	0.079	0.016	-	-
HCM Control Delay (s)	0	-	-	11.5	9.6	7.6	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0.1	-	-

Intersection						
Int Delay, s/veh	3.9					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	29	10	9	21	16
Future Vol, veh/h	3	29	10	9	21	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	25	48	50	50	63	50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	60	20	18	33	32

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	38	0	-	0	113	29
Stage 1	-	-	-	-	29	-
Stage 2	-	-	-	-	84	-
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	1572	-	-	-	884	1046
Stage 1	-	-	-	-	994	-
Stage 2	-	-	-	-	939	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1572	-	-	-	877	1046
Mov Cap-2 Maneuver	-	-	-	-	877	-
Stage 1	-	-	-	-	986	-
Stage 2	-	-	-	-	939	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1572	-	-	-	952
HCM Lane V/C Ratio	0.008	-	-	-	0.069
HCM Control Delay (s)	7.3	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	17	25	4	0	20
Future Vol, veh/h	7	17	25	4	0	20
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	25	70	54	50	25	50
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	24	46	8	0	40

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	54	0	-	0	130	50
Stage 1	-	-	-	-	50	-
Stage 2	-	-	-	-	80	-
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	1551	-	-	-	864	1018
Stage 1	-	-	-	-	972	-
Stage 2	-	-	-	-	943	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1551	-	-	-	848	1018
Mov Cap-2 Maneuver	-	-	-	-	848	-
Stage 1	-	-	-	-	955	-
Stage 2	-	-	-	-	943	-

Approach	EB	WB	SB
HCM Control Delay, s	3.9	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1551	-	-	-	1018
HCM Lane V/C Ratio	0.018	-	-	-	0.039
HCM Control Delay (s)	7.4	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	347	29	219	527	180	26	97	64	187	215	150
Future Volume (veh/h)	123	347	29	219	527	180	26	97	64	187	215	150
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	1900	1900	1900	1885	1900	1900	1870	1885	1900	1885
Adj Flow Rate, veh/h	134	377	50	255	693	198	43	114	81	208	269	176
Peak Hour Factor	0.92	0.92	0.58	0.86	0.76	0.91	0.60	0.85	0.79	0.90	0.80	0.85
Percent Heavy Veh, %	2	2	0	0	0	1	0	0	2	1	0	1
Cap, veh/h	225	675	581	457	758	638	332	710	593	472	710	597
Arrive On Green	0.07	0.36	0.36	0.11	0.40	0.40	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	1781	1870	1610	1810	1900	1598	960	1900	1585	1197	1900	1598
Grp Volume(v), veh/h	134	377	50	255	693	198	43	114	81	208	269	176
Grp Sat Flow(s),veh/h/ln	1781	1870	1610	1810	1900	1598	960	1900	1585	1197	1900	1598
Q Serve(g_s), s	4.7	16.1	2.0	8.5	34.5	8.5	3.4	4.0	3.4	14.0	10.3	7.8
Cycle Q Clear(g_c), s	4.7	16.1	2.0	8.5	34.5	8.5	13.7	4.0	3.4	18.0	10.3	7.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	225	675	581	457	758	638	332	710	593	472	710	597
V/C Ratio(X)	0.60	0.56	0.09	0.56	0.91	0.31	0.13	0.16	0.14	0.44	0.38	0.29
Avail Cap(c_a), veh/h	248	786	676	466	855	719	332	710	593	472	710	597
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)	0.70	0.70	0.70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.5	25.6	21.1	17.7	28.4	20.6	27.8	20.9	20.7	26.8	22.8	22.0
Incr Delay (d2), s/veh	2.3	0.5	0.0	1.4	13.2	0.3	0.8	0.5	0.5	3.0	1.5	1.3
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	2.0	7.0	0.8	3.5	17.6	3.1	0.8	1.8	1.3	4.3	4.8	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	26.1	21.1	19.1	41.6	20.9	28.7	21.3	21.1	29.8	24.4	23.3
LnGrp LOS	C	C	C	B	D	C	C	C	C	C	C	C
Approach Vol, veh/h		561			1146			238			653	
Approach Delay, s/veh		25.6			33.0			22.6			25.8	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		43.4	14.5	42.1		43.4	10.7	45.9				
Change Period (Y+Rc), s		6.0	4.0	6.0		6.0	4.0	6.0				
Max Green Setting (Gmax), s		31.0	11.0	42.0		31.0	8.0	45.0				
Max Q Clear Time (g_c+I1), s		15.7	10.5	18.1		20.0	6.7	36.5				
Green Ext Time (p_c), s		0.9	0.0	2.4		2.3	0.0	3.4				

Intersection Summary			
HCM 6th Ctrl Delay			28.6
HCM 6th LOS			C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	383	122	70	495	62	64	64	45	70	147	108
Future Volume (veh/h)	16	383	122	70	495	62	64	64	45	70	147	108
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	1781	1885	1885	1870	1885	1900	1900	1900	1811	1900	1885	1811
Adj Flow Rate, veh/h	24	416	137	73	611	84	78	72	56	76	226	123
Peak Hour Factor	0.67	0.92	0.89	0.96	0.81	0.74	0.82	0.89	0.81	0.92	0.65	0.88
Percent Heavy Veh, %	8	1	1	2	1	0	0	0	6	0	1	6
Cap, veh/h	348	608	200	153	959	132	212	278	216	390	322	175
Arrive On Green	0.45	0.45	0.45	0.09	0.59	0.59	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	714	1358	447	1781	1622	223	1048	991	771	1282	1148	625
Grp Volume(v), veh/h	24	0	553	73	0	695	78	0	128	76	0	349
Grp Sat Flow(s),veh/h/ln	714	0	1805	1781	0	1845	1048	0	1761	1282	0	1773
Q Serve(g_s), s	1.6	0.0	17.1	2.7	0.0	17.3	5.0	0.0	3.9	3.4	0.0	12.3
Cycle Q Clear(g_c), s	8.9	0.0	17.1	2.7	0.0	17.3	17.4	0.0	3.9	7.4	0.0	12.3
Prop In Lane	1.00		0.25	1.00		0.12	1.00		0.44	1.00		0.35
Lane Grp Cap(c), veh/h	348	0	809	153	0	1090	212	0	494	390	0	497
V/C Ratio(X)	0.07	0.00	0.68	0.48	0.00	0.64	0.37	0.00	0.26	0.19	0.00	0.70
Avail Cap(c_a), veh/h	348	0	809	153	0	1090	247	0	554	434	0	557
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	0.00	1.00	0.61	0.00	0.61	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.6	0.0	15.4	30.5	0.0	9.4	30.4	0.0	19.5	22.4	0.0	22.6
Incr Delay (d2), s/veh	0.4	0.0	4.7	6.4	0.0	1.8	1.1	0.0	0.3	0.2	0.0	3.4
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	0.3	0.0	7.1	1.4	0.0	5.9	1.3	0.0	1.6	1.0	0.0	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.0	0.0	20.0	36.9	0.0	11.1	31.4	0.0	19.8	22.6	0.0	26.0
LnGrp LOS	B	A	C	D	A	B	C	A	B	C	A	C
Approach Vol, veh/h		577			768			206			425	
Approach Delay, s/veh		19.9			13.6			24.2			25.4	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.0	36.4		23.6		46.4		23.6				
Change Period (Y+Rc), s	4.0	* 5		4.0		* 5		4.0				
Max Green Setting (Gmax), s	6.0	* 29		22.0		* 39		22.0				
Max Q Clear Time (g_c+I1), s	4.7	19.1		14.3		19.3		19.4				
Green Ext Time (p_c), s	0.0	2.7		1.5		4.7		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			19.1									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	1					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	17	8	144	344	56
Future Vol, veh/h	11	17	8	144	344	56
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	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	44	88	56	86	87	100
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	25	19	14	167	395	56

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	590	395	451	0	-	0
Stage 1	395	-	-	-	-	-
Stage 2	195	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	474	659	1120	-	-	-
Stage 1	685	-	-	-	-	-
Stage 2	843	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	467	659	1120	-	-	-
Mov Cap-2 Maneuver	467	-	-	-	-	-
Stage 1	675	-	-	-	-	-
Stage 2	843	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.3	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1120	-	535	-	-
HCM Lane V/C Ratio	0.013	-	0.083	-	-
HCM Control Delay (s)	8.3	0	12.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	0	1	8	0	30	0	86	0	61	151	6
Future Vol, veh/h	4	0	1	8	0	30	0	86	0	61	151	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	25	25	42	25	53	25	89	25	73	84	50
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	0	0
Mvmt Flow	10	0	4	19	0	57	0	97	0	84	180	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	480	451	186	453	457	97	192	0	0	97	0	0
Stage 1	354	354	-	97	97	-	-	-	-	-	-	-
Stage 2	126	97	-	356	360	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	499	507	861	520	503	965	1394	-	-	1509	-	-
Stage 1	667	634	-	914	819	-	-	-	-	-	-	-
Stage 2	883	819	-	666	630	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	448	476	861	493	472	965	1394	-	-	1509	-	-
Mov Cap-2 Maneuver	448	476	-	493	472	-	-	-	-	-	-	-
Stage 1	667	595	-	914	819	-	-	-	-	-	-	-
Stage 2	831	819	-	622	591	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.1	10.1	0	2.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1394	-	-	522	778	1509	-	-
HCM Lane V/C Ratio	-	-	-	0.026	0.097	0.055	-	-
HCM Control Delay (s)	0	-	-	12.1	10.1	7.5	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0.2	-	-

Intersection						
Int Delay, s/veh	4					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	7	42	18	20	0
Future Vol, veh/h	24	7	42	18	20	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	50	69	82	50	50	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	48	10	51	36	40	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	87	0	-	0	175	69
Stage 1	-	-	-	-	69	-
Stage 2	-	-	-	-	106	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1522	-	-	-	819	1000
Stage 1	-	-	-	-	959	-
Stage 2	-	-	-	-	923	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1522	-	-	-	793	1000
Mov Cap-2 Maneuver	-	-	-	-	793	-
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	923	-

Approach	EB	WB	SB
HCM Control Delay, s	6.1	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1522	-	-	-	793
HCM Lane V/C Ratio	0.032	-	-	-	0.05
HCM Control Delay (s)	7.4	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection						
Int Delay, s/veh	4					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	38	19	22	0	19
Future Vol, veh/h	15	38	19	22	0	19
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	75	75	63	75	25	25
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	20	51	30	29	0	76

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	59	0	-	0	136	45
Stage 1	-	-	-	-	45	-
Stage 2	-	-	-	-	91	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1558	-	-	-	862	1031
Stage 1	-	-	-	-	983	-
Stage 2	-	-	-	-	938	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1558	-	-	-	851	1031
Mov Cap-2 Maneuver	-	-	-	-	851	-
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	938	-

Approach	EB	WB	SB
HCM Control Delay, s	2.1	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1558	-	-	-	1031
HCM Lane V/C Ratio	0.013	-	-	-	0.074
HCM Control Delay (s)	7.3	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2