MEMORANDUM

TO: Brandon Gray (Project Control, Inc)

FROM: LaQuita Chmielowski, P.E. (DOWL)
Connor Denning, E.I.T. (DOWL)

DATE: October 17, 2022

SUBJECT: Traffic Impact Analysis for AK444 Residential Development

BACKGROUND

This memorandum evaluates potential traffic impacts associated with the proposed AK444 residential development. The proposed development is located off Glacier Road, just northeast of the Juneau International Airport. The AK444 development would consist of 28 single family homes and 416 low-rise apartment units. Access to the development will be provided via a new access point, located east of Vista Del Sol Drive. Opening year for the development is expected in 2025. The site plan for the development is included in the Appendix.

This study examines existing intersection operations in the study area, along with future traffic operations in 2032 with and without the AK444 residential development.

EXISTING CONDITIONS

Existing conditions were analyzed in the study area including existing roadway characteristics, traffic volumes, intersection operations, and crash history.

Roadway Characteristics & Study Intersections

The proposed development is located at 7400 Glacier Highway; the majority of development traffic is expected to travel to and from Highway 7. Figure 1 shows the proposed development location and the adjacent study intersections. Table 1 shows the existing traffic control at each study intersection, while Table 2 provides the functional classification, posted speed limit and cross section for roadways in the study area. The Glacier Highway and Egan Road intersection is signalized with protected permitted left-turn phasing, along with pedestrian-only phases for the east and west legs.

Due to restrictions in the HCM 2010 methodology, the Egan Drive and Highway 7 EB Ramps intersection is modeled as a two way stop. To estimate the delay with the current configuration, the delay from both stop approaches are added together and reported.

Table 1: Traffic Control at Study Intersections

Intersection	Traffic Control
Glacier Highway & Old Dairy Road	Stop Controlled on Old Dairy Road
Highway 7 & Old Dairy Road	None - Free Movement from Side Street onto Highway 7
Glacier Highway & Egan Drive	Traffic Signal
Egan Drive & Highway 7 WB Ramps	Stop Controlled on WB Off Ramp
Egan Drive & Highway 7 EB Ramps	Stop Controlled on EB Off Ramp

EXISTING TRAFFIC CONTROL AT STUDY INTERSECTIONS

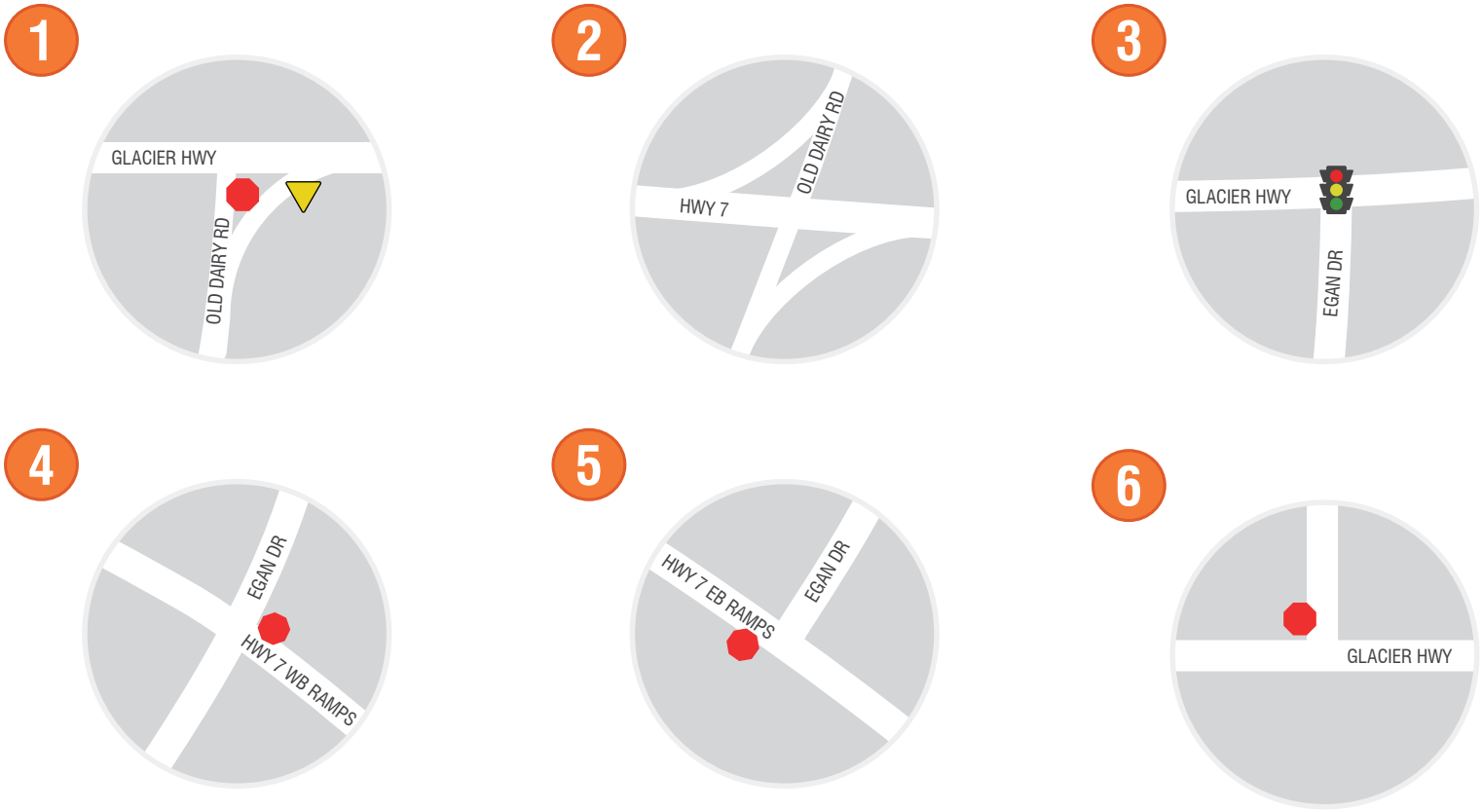


Figure 1: Existing Traffic Control at Study Intersections

Table 2: Study Area Roadway Characteristics

Road	Functional Classification	Posted Speed	Cross-section
Egan Drive	Principal Arterial	None Posted	2 lanes 1 each direction
Glacier Highway	Minor Arterial (E of Old Dairy) Local (W of Old Dairy)	45 mph	2 lanes 1 each direction
Highway 7	Principal Arterial	55 mph	4 lane divided highway 2 each direction
Old Dairy Road	Minor Arterial	None Posted	2 lanes 1 each direction

Existing Traffic Volumes

Existing traffic volumes were collected on Tuesday, September 13, 2022. Data was collected at the five existing study intersections using 16-hour turning movement counts (6:00 AM to 10:00 PM). In addition, a 24-hour tube count was collected on Glacier Highway (2,750 feet east of Old Dairy Road) to evaluate existing traffic volumes, speeds, and vehicle classification information. The AM peak hour of traffic was identified at 7:30 - 8:30 AM, while the PM peak hour was identified as 4:00 - 5:00 PM.

A seasonal adjustment factor (SAF) of 1.10 was applied to the traffic count data, to represent typical traffic conditions. The SAF was calculated using data from the nearby Alaska Department of Transportation & Public Facilities (DOT&PF) permanent count station located on Highway 7 west of Egan Drive[1]. Figure 2 shows the seasonally adjusted existing AM and PM peak hour turning movement volumes at study intersections.

[1] Data from https://alaskatrafficdata.drakewell.com

EXISTING CONDITIONS VOLUMES

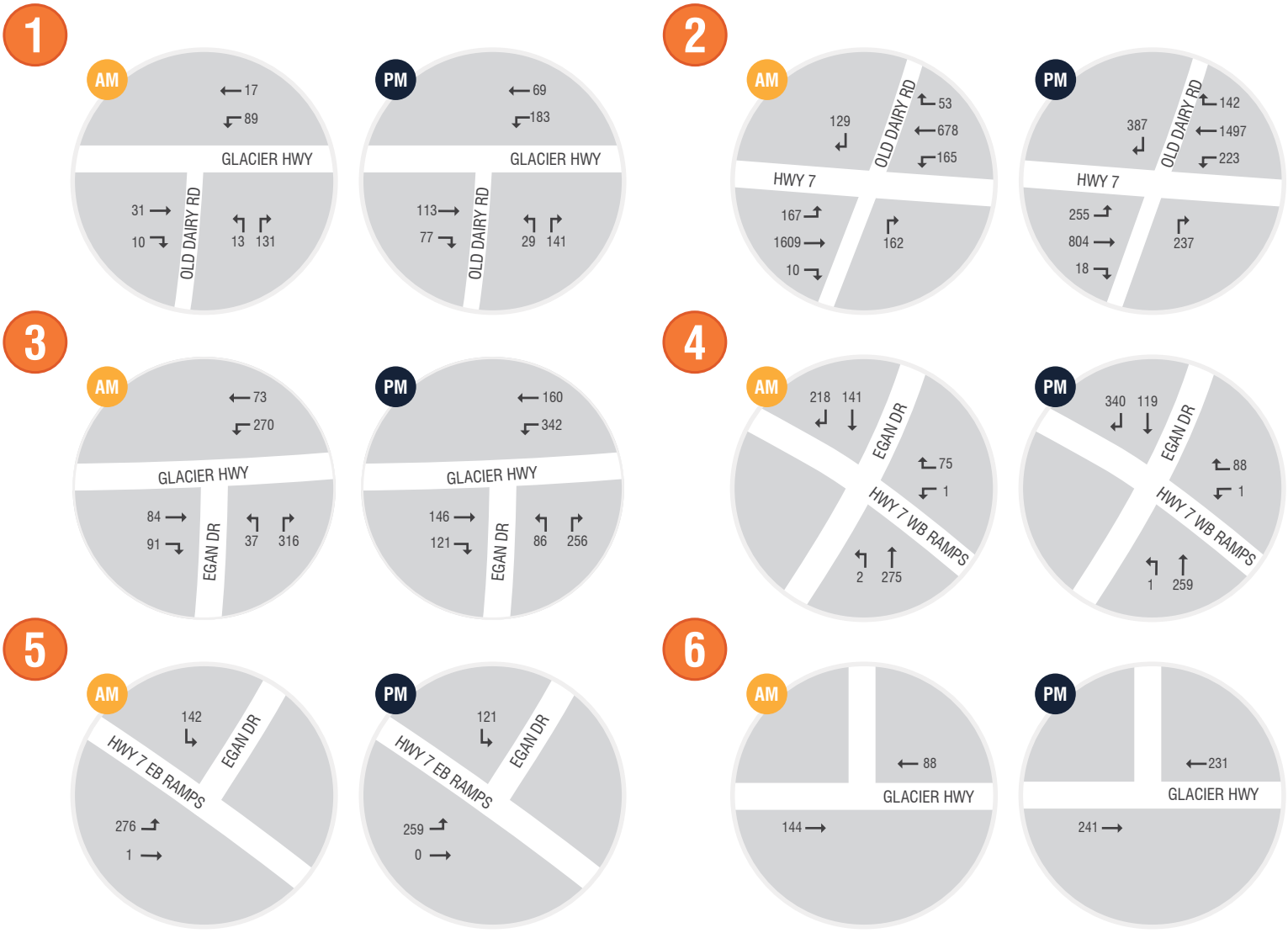


Figure 2: Existing AM and PM Peak Hour Traffic Volumes

Mobility Standards

Traffic operations were modeled in Synchro/SimTraffic version 11. Synchro reports are provided in the Appendix. Following guidance from the 2022 Alaska DOT&PF Highway Preconstruction Manual2, this study uses the 2010 Highway Capacity Manual (HCM)3 methodology to calculate intersection level of service (LOS). In the event that 2010 HCM methodology cannot be used due to non-NEMA phasing, or pedestrian phases, delay and LOS will be reported using HCM 2000. Table 3 shows LOS targets for each roadway functional class, for sites located in suburban, urban, urban core, or rural town areas (obtained from Chapter 2.4.5 of the 2011 AASHTO Green Book4). The Alaska Administrative Code (AAC)[5] establishes a minimum LOS for the development's construction and design years. These code and policy documents state the following minimum acceptable LOS for the construction and design years:

• LOS C is acceptable if the existing conditions are LOS C or better

• LOS D is acceptable if the existing conditions are LOS D

• If the existing conditions are poorer than LOS D, a lower LOS is acceptable if the operation does not deteriorate more than ten percent (10%) in terms of delay time or any other appropriate measure of effectiveness compared with the background condition (i.e., without the development).

Table 3: Level of Service Targets from AASHTO Green Book Table 2-3

Functional Classification	Design Level of Service
Freeway	C or D
Arterial	C or D
Collector	D
Local	D

Existing Intersection Traffic Operations

Table 4 shows the existing delay and LOS at study intersections (reported using the 2010 HCM delay methodology). Overall intersection delay is reported at the signalized intersection (Glacier Highway and Egan Drive), while delay is only reported for the critical movement (or highest delay approach) at two-way stop controlled intersections. All intersections currently operate at LOS C or better, except for the Highway 7 and Old Dairy Road intersection which currently operates at LOS E for the eastbound and westbound left-turn movements.

[2] Alaska Highway Preconstruction Manual, Alaska Department of Transportation and Public Facilities, 2022.

[3] HCM 2010: Highway Capacity Manual, Transportation Research Board, 2010.

[4] A Policy on Geometric Design of Highways and Streets, The American Association of State Highway and Transportation Officials, 2011.

[5] Section 17 Alaska Administrative Code 10.070, https://www.akleg.gov/basis/aac.asp#17.10.070

Table 4: Existing Conditions Traffic Operations

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay	Critical Movement	LOS	Delay	Critical Movement
Glacier Highway & Old Dairy Road	B	11	NB	C	16	NB
Highway 7 & Old Dairy Road	E	46	WBL	E	37	EBL
Glacier Highway & Egan Drive[a]	B	13	-	B	13	-
Egan Drive & Highway 7 WB Ramps	B	11	WB	B	11	WB
Egan Drive & Highway 7 EB Ramps	C	21	EB	B	19	EB

[a] HCM 2000 methodology used due to pedestrian only phases.

Crash History

Tables 5 and 6 show crash history for the study intersections for the five most recent years of available crash data (January 1, 2016 to December 31, 2020). The Highway 7 and Old Dairy Road intersection had 28 crashes over the last five years, including four fatal crashes. Table 5 shows the crash rate at each study intersection, along with the statewide average crash rate (based on the intersection traffic control and number of approaches). The statewide averages are based on data from 2008 to 2012 and represent the most recent data available[6]. Although the crash rate at the Highway 7 and Old Dairy Road intersection is below the statewide average, the presence of fatal crashes raises safety concerns at the intersection. Table 6 shows the breakdown of crashes by crash type at the intersections.

Table 5: Total Crashes and Crash Rate by Intersection (2016 – 2020)

Intersection	Crash Rate [a]		Crash Severity			Total Crashes
	Intersection	Statewide Average	Fatal	Injury	PDO	
Glacier Highway & Old Dairy Road	-	-	-	-	-	0
Highway 7 & Old Dairy Road	0.43	0.55	4	14	10	28
Glacier Highway & Egan Drive	-	-	-	-	-	0
Egan Drive & Highway 7 WB Ramps	0.07	0.57	0	1	0	1
Egan Drive & Highway 7 EB Ramps	-	-	-	-	-	0

[6] Alaska Highway Safety Improvement Program Handbook, Alaska DOT&PF, January 2017.

Table 6: Crash Type by Intersection (2016 – 2020)

Intersection	Angle	Single Vehicle Run-off	Rear End	Undetermined
Glacier Highway & Old Dairy Road	-	-	-	-
Highway 7 & Old Dairy Road	20 (2)	3	1	4 (2)
Glacier Highway & Egan Drive	-	-	-	-
Egan Drive & Highway 7 WB Ramps	1	-	-	-
Egan Drive & Highway 7 EB Ramps	-	-	-	-

(#) Denotes number of fatal crashes

FUTURE CONDITIONS

2032 No-Build Traffic Operations

Figure 3 shows the expected AM and PM peak hour turning movements in 2032, without the proposed AK444 development. Future traffic volumes were generated using a compound annual growth rate of 0.25% per year. This growth rate was established through the Juneau Douglas Second Channel Planning and Environmental Linkages Study[7] with concurrence from DOT&PF staff[8].

Table 7 shows the expected delay and LOS at study intersections in 2032, without the AK444 development. Due to the low expected traffic growth, there are only minor changes in the traffic operations at study intersections. The Highway 7 and Old Dairy Road intersection continues to fail, operating with a LOS E and F for the eastbound and westbound left-turn movements. Of note, the results reported at Glacier Highway and Egan Drive assume that signal timings have been optimized to accommodate future traffic volumes.

Table 7: 2032 No-Build Traffic Operations

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay	Critical Movement	LOS	Delay	Critical Movement
Glacier Highway & Old Dairy Road	B	11	NB	C	16	NB
Highway 7 & Old Dairy Road	F	55	WBL	E	44	EBL
Glacier Highway & Egan Drive	B	11	-	B	11	-
Egan Drive & Highway 7 WB Ramps	B	11	WB	B	11	WB
Egan Drive & Highway 7 EB Ramps	C	21	EB	B	20	EB

[7] Juneau Douglas Second Channel Draft Planning and Environmental Linkages Study, DOWL, 2022.

[8] Email from DOT&PF staff on September 7th, 2022.

FUTURE 2032 NO - BUILD VOLUMES

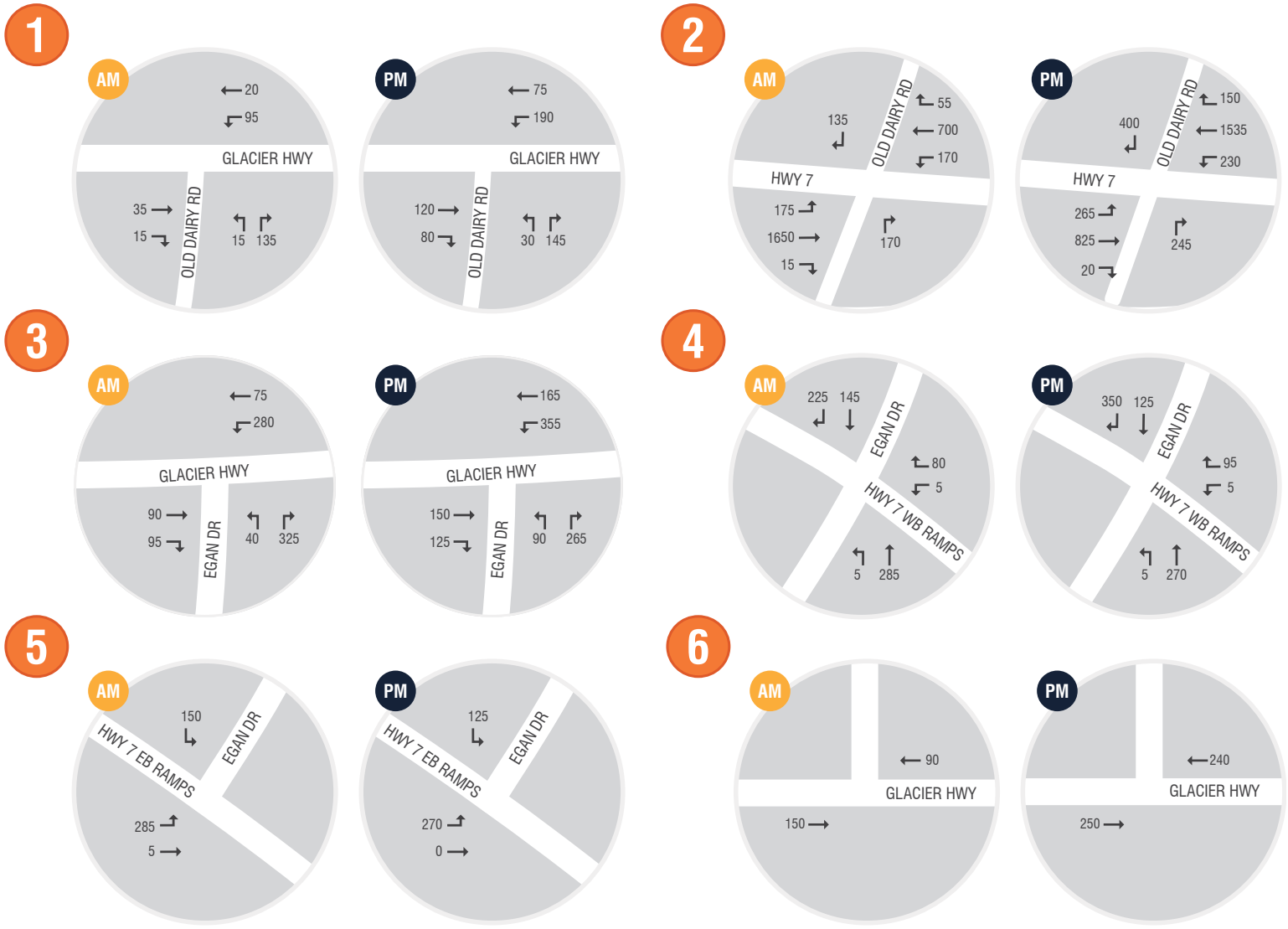


Figure 3: Future No-Build Traffic Volumes

Trip Generation

Trip generation rates for the proposed development are based on the data published in the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition*. Table 8 shows the number and type of residential units expected at the AK444 development, by land use code. This information was used to calculate the expected number of inbound and outbound trips during a typical weekday, and the AM and PM peak hours of the adjacent road. The *ITE Trip Generation Manual* two ways for determining the number of trips. If the R-squared value is greater than 0.75, ITE recommends the use of the trip rate equation over the average trip generation rate, which is true for both of the applicable land use codes. Table 9 shows the estimated AM, PM, and daily trips generated by the AK444 development.

Table 8: Development Land Use Types and Units

Land Use Code	Land Use Type	Units
215	Single-Family Attached Housing	28
220	Multifamily Housing (Low Rise)	416

Table 9: Daily Development Trips

Land Use #	Units	AM Peak Hour			PM Peak Hour			Daily Trips
		Trips in	Trips Out	Total	Trips in	Trips Out	Total	
215	28	3	6	9	9	7	16	163
220	416	36	116	152	125	74	199	2742
Total	444	39	122	161	134	81	215	2905

Trip Distribution

Trip distribution involves estimating where traffic is coming from and going to when accessing the development. The trip distribution was established based on existing traffic patterns, regional land uses, and locations of existing employment centers. Development traffic was distributed using the following assumptions for trip origins and destinations:

- 50% to/from Highway 7 (east of Egan Drive)
- 30% to/from Highway 7 (west of Old Dairy Road)
- 10% to/from Glacier Highway (west of Old Dairy Road)
- 10% to/from Glacier Highway (east of Egan Drive)

Figure 4 shows the expected development-related traffic expected at study intersections in the AM and PM peak hours.

ADDED 2032 DEVELOPMENT VOLUMES

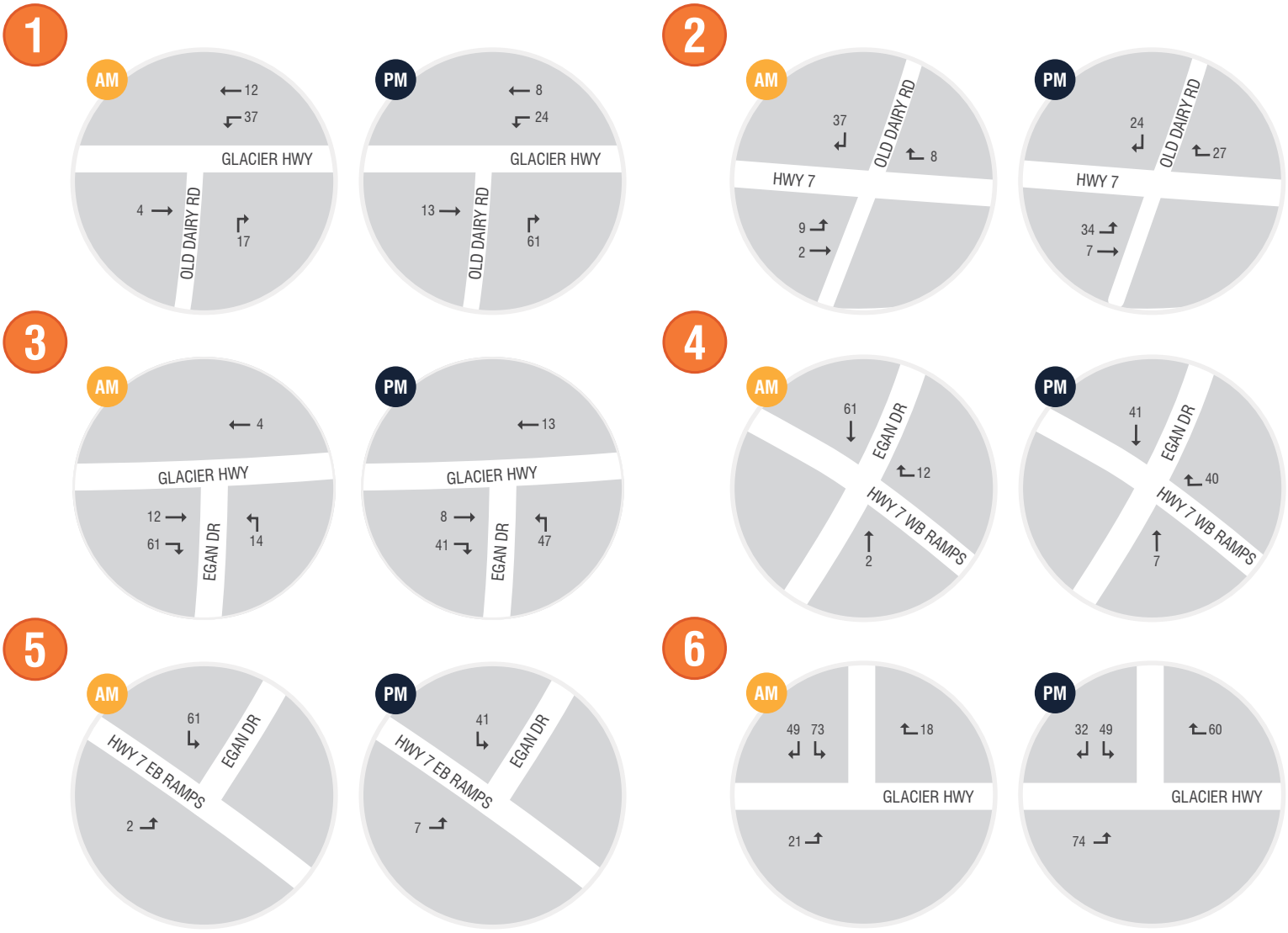


Figure 4: Added Development Traffic Volumes

2032 Traffic Operations with Development

Figure 5 shows the total traffic expected at study intersections in 2032, with the development. Table 10 shows the expected traffic operations at each study intersection. The development is expected to increase delay at the Highway 7 and Old Dairy Road intersection (although this intersection was already failing in the future no-build condition). All other study intersections are expected to operate at LOS D or better with the development in 2032.

Table 10: 2032 Traffic Operations with Development

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay	Critical Movement	LOS	Delay	Critical Movement
Glacier Highway & Old Dairy Road	B	12	NB	C	18	NB
Highway 7 & Old Dairy Road	F	55	WBL	F	60	EBL
Glacier Highway & Egan Drive	B	14	-	B	13	-
Egan Drive & Highway 7 WB Ramps	B	11	WB	B	11	WB
Egan Drive & Highway 7 EB Ramps	C	23	EB	C	21	EB
Development & Glacier Highway	B	11	SB	C	16	SB

Mitigation measures examined for the Highway 7 and Old Dairy Road intersection included closure of the EB and WB left turn lanes as well as a future traffic signal. Closure of the left turn lanes led to substandard performance at the Egan Drive and Highway 7 ramp intersections. A traffic signal at Highway 7 and Old Dairy Road may be the most effective traffic operations solution but given the high angle collision rate noted previously this should be examined as part of an intersection specific traffic study conducted by DOT&PF to determine the long-term solution for this intersection.

FUTURE 2032 BUILD VOLUMES

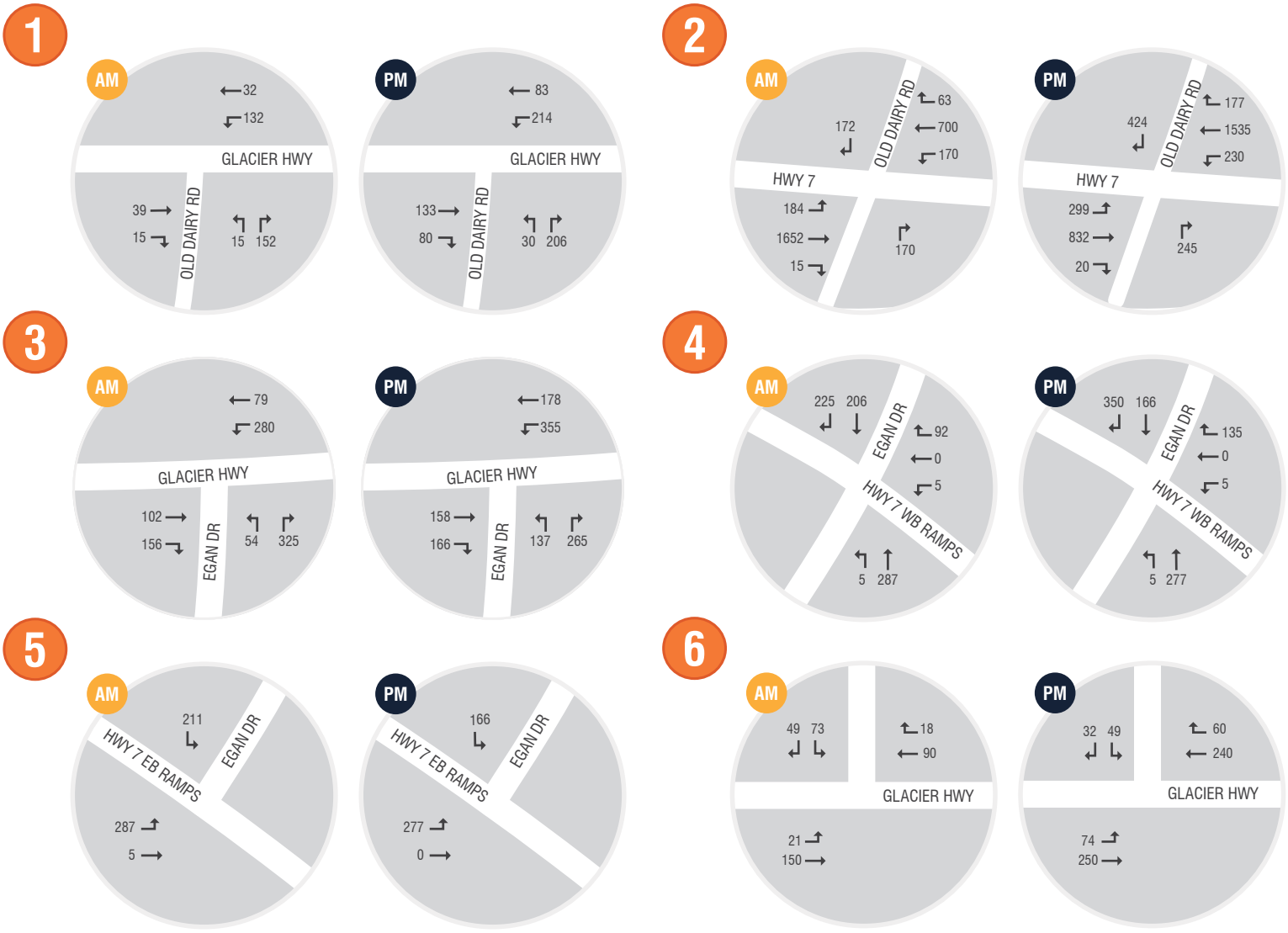


Figure 5: 2032 Build Volumes

CONCLUSIONS

The proposed AK444 residential development as currently planned will add 28 single family homes and 416 low rise apartment units off Glacier Highway generating 161 trips in the AM and 362 trips in the PM peaks.

Highway 7 and Old Dairy Road intersection is failing today and is expected to fail in 2032 with or without the development (high delay is expected for the eastbound and westbound left-turn movements). In addition, this intersection experiences a disproportionate number of angle and high severity collisions. Given the operational and safety concerns this intersection should be examined as part of an intersection specific traffic study conducted by DOT&PF to determine the long-term solution for this intersection.

No mitigation specific to the AK444 residential development is anticipated at this time.

Appendix

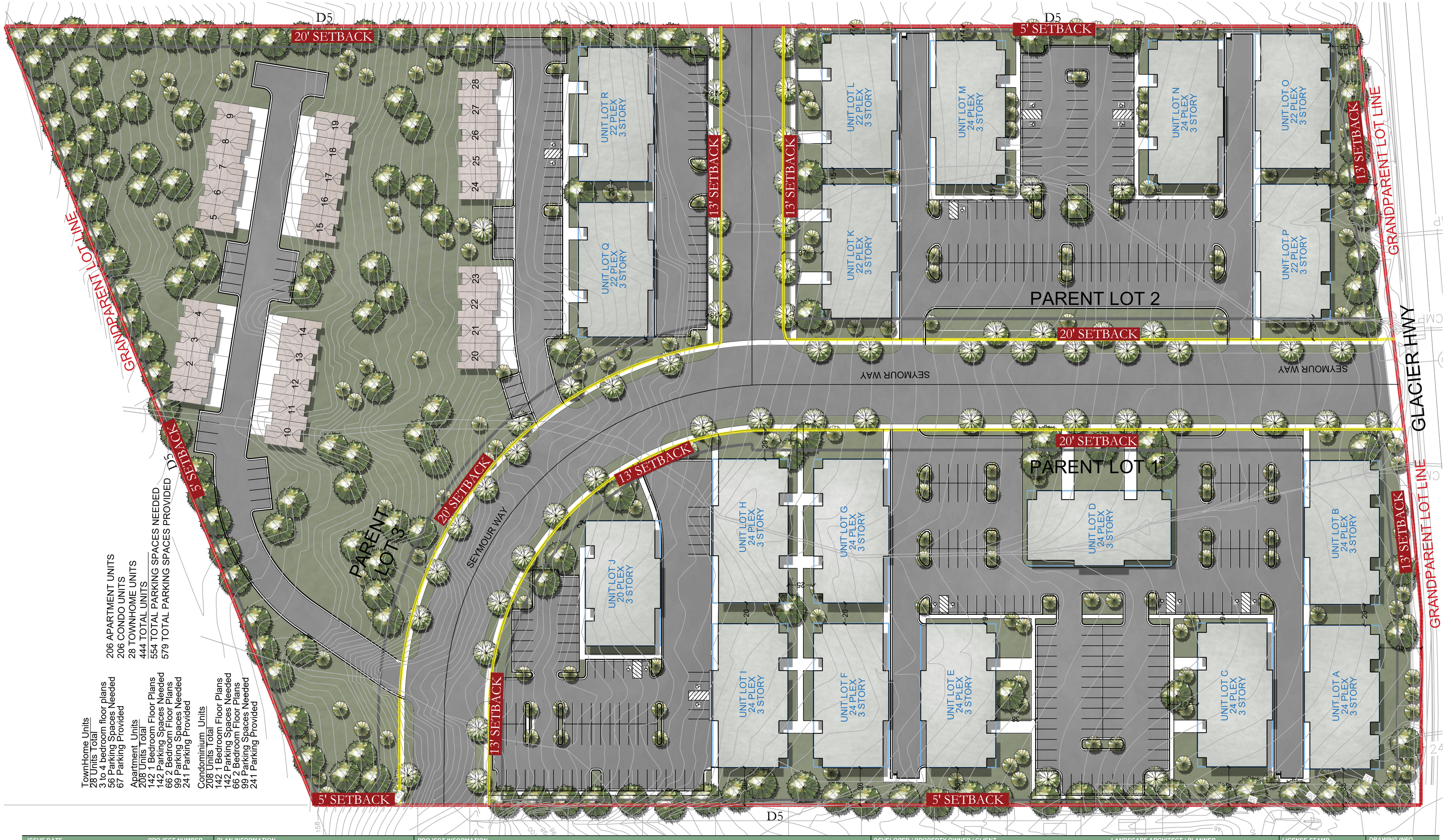
Site Information

HCM Analysis – Existing

HCM Analysis –No-Build

HCM Analysis – Build

Site Information



206 APARTMENT UNITS
206 CONDO UNITS
28 TOWNHOME UNITS
444 TOTAL UNITS
554 TOTAL PARKING SPACES NEEDED
579 TOTAL PARKING SPACES PROVIDED

TownHome Units
28 Units Total
3 to 4 bedroom floor plans
56 Parking Spaces Needed
67 Parking Provided

Apartment Units
208 Units Total
142 1 Bedroom Floor Plans
142 Parking Spaces Needed
66 2 Bedroom Floor Plans
99 Parking Spaces Needed
241 Parking Provided

Condominium Units
208 Units Total
142 1 Bedroom Floor Plans
142 Parking Spaces Needed
66 2 Bedroom Floor Plans
99 Parking Spaces Needed
241 Parking Provided

ISSUE DATE	PROJECT NUMBER	PLAN INFORMATION
9/16/2022	AK21001	

NO.	REVISION	DATE
1	XXXX	XX-XX-XX
2		
3		
4		
5		
6		
7		

811 BLUE STAKES OF UTAH
UTILITY NOTIFICATION CENTER, INC
1-800-662-4111
www.bluestakes.org

0' 20' 40' 80' 160'
GRAPHIC SCALE: 1" = 40'

PROJECT INFORMATION

ALASKA 20 ACRE
JUNEAU, ALASKA

DEVELOPER / PROPERTY OWNER / CLIENT

PCI
ATT:BRANDON GRAY
801-358-5381
BRANDON@PCI1980.COM

LANDSCAPE ARCHITECT / PLANNER

PKJ DESIGN GROUP
Landscape Architecture / Planning & Visualization
3450 N. TRIUMPH BLVD. SUITE 102
LEHI, UTAH 84043 (801) 753-5644
www.pkjdesigngroup.com

LICENSE STAMP

DRAWING INFO

PM:	JTA
DRAWN:	ACP
CHECKED:	JMA
PLOT DATE:	9/16/2022

LANDSCAPE PLAN COLOR

PRELIMINARY PLANS NOT FOR CONSTRUCTION

LP-COLOR

HCM Analysis – Existing

Intersection	
Int Delay, s/veh	6.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	31	10	89	17	13	131
Future Vol, veh/h	31	10	89	17	13	131
Conflicting Peds, #/hr	0	0	0	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	110	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	7	19	4	5	0	4
Mvmt Flow	37	12	106	20	15	156

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	49	0	277	43
Stage 1	-	-	-	-	43	-
Stage 2	-	-	-	-	234	-
Critical Hdwy	-	-	4.14	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.236	-	3.5	3.336
Pot Cap-1 Maneuver	-	-	1545	-	717	1022
Stage 1	-	-	-	-	985	-
Stage 2	-	-	-	-	810	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1545	-	666	1022
Mov Cap-2 Maneuver	-	-	-	-	666	-
Stage 1	-	-	-	-	985	-
Stage 2	-	-	-	-	752	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.3	9.3
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	666	1022	-	-	1545	-
HCM Lane V/C Ratio	0.023	0.153	-	-	0.069	-
HCM Control Delay (s)	10.5	9.2	-	-	7.5	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	0.5	-	-	0.2	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	167	1609	10	165	678	53	0	0	0	0	0	129
Future Vol, veh/h	167	1609	10	165	678	53	0	0	0	0	0	129
Conflicting Peds, #/hr	1	0	0	0	0	1	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	Free
Storage Length	520	-	390	380	-	325	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	2	1	5	2	0	7	0	0	0	0	0
Mvmt Flow	204	1962	12	201	827	65	0	0	0	0	0	157

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	828	0	0	1974	0	0				-	-	-
Stage 1	-	-	-	-	-	-				-	-	-
Stage 2	-	-	-	-	-	-				-	-	-
Critical Hdwy	4.1	-	-	4.2	-	-				-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-				-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				-	-	-
Follow-up Hdwy	2.2	-	-	2.25	-	-				-	-	-
Pot Cap-1 Maneuver	812	-	-	278	-	-				0	0	0
Stage 1	-	-	-	-	-	-				0	0	0
Stage 2	-	-	-	-	-	-				0	0	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	812	-	-	278	-	-				-	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-				-	0	-
Stage 1	-	-	-	-	-	-				-	0	-
Stage 2	-	-	-	-	-	-				-	0	-

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

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	812	-	-	278	-	-	-
HCM Lane V/C Ratio	0.251	-	-	0.724	-	-	-
HCM Control Delay (s)	10.9	-	-	45.7	-	-	0
HCM Lane LOS	B	-	-	E	-	-	A
HCM 95th %tile Q(veh)	1	-	-	5.1	-	-	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	84	91	270	73	37	316
Future Volume (vph)	84	91	270	73	37	316
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3		5.0	5.3	5.0	5.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.93		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1712		1735	1827	1787	1518
Flt Permitted	1.00		0.42	1.00	0.95	1.00
Satd. Flow (perm)	1712		773	1827	1787	1518
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	102	111	329	89	45	385
RTOR Reduction (vph)	45	0	0	0	0	317
Lane Group Flow (vph)	168	0	329	89	45	68
Confl. Peds. (#/hr)		1	1			1
Heavy Vehicles (%)	2%	2%	4%	4%	1%	4%
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	3	
Permitted Phases			2			3
Actuated Green, G (s)	10.5		30.0	30.0	8.6	8.6
Effective Green, g (s)	10.5		30.0	30.0	8.6	8.6
Actuated g/C Ratio	0.21		0.61	0.61	0.18	0.18
Clearance Time (s)	5.3		5.0	5.3	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	367		759	1120	314	266
v/s Ratio Prot	0.10		c0.13	0.05	0.03	
v/s Ratio Perm			c0.14			c0.04
v/c Ratio	0.46		0.43	0.08	0.14	0.25
Uniform Delay, d1	16.7		4.9	3.8	17.0	17.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9		0.4	0.0	0.2	0.5
Delay (s)	17.6		5.3	3.9	17.2	17.9
Level of Service	B		A	A	B	B
Approach Delay (s)	17.6			5.0	17.8	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	48.9	Sum of lost time (s)	21.3
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SER
Lane Configurations										
Traffic Vol, veh/h	1	0	2	275	0	0	141	218	0	0
Future Vol, veh/h	1	0	2	275	0	0	141	218	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	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	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	92	92
Heavy Vehicles, %	0	0	0	5	0	0	4	5	2	2
Mvmt Flow	1	0	3	353	0	0	181	279	0	0

Major/Minor	Minor1		Major1			Major2		
Conflicting Flow All	680	353	460	0	-	-	-	0
Stage 1	359	-	-	-	-	-	-	-
Stage 2	321	-	-	-	-	-	-	-
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	420	695	1112	-	0	0	-	-
Stage 1	711	-	-	-	0	0	-	-
Stage 2	740	-	-	-	0	0	-	-
Platoon blocked, %				-			-	-
Mov Cap-1 Maneuver	419	695	1112	-	-	-	-	-
Mov Cap-2 Maneuver	419	-	-	-	-	-	-	-
Stage 1	709	-	-	-	-	-	-	-
Stage 2	740	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1112	-	695	-	-
HCM Lane V/C Ratio	0.002	-	0.138	-	-
HCM Control Delay (s)	8.2	0	11	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Movement	WBR	SBL	SBR	SEL
Lane Configurations				
Traffic Vol, veh/h	0	142	0	1
Future Vol, veh/h	0	142	0	1
Peak Hour Factor	0.84	0.84	0.84	0.84
Heavy Vehicles, %	0	3	0	0
Mvmt Flow	0	169	0	1
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	
Opposing Lanes	0
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	SE
Conflicting Lanes Right	1
HCM Control Delay	9.5
HCM LOS	A

Lane	SELn1	SBLn1
Vol Left, %	100%	100%
Vol Thru, %	0%	0%
Vol Right, %	0%	0%
Sign Control	Stop	Stop
Traffic Vol by Lane	277	142
LT Vol	277	142
Through Vol	0	0
RT Vol	0	0
Lane Flow Rate	330	169
Geometry Grp	1	1
Degree of Util (X)	0.416	0.232
Departure Headway (Hd)	4.537	4.945
Convergence, Y/N	Yes	Yes
Cap	795	727
Service Time	2.557	2.971
HCM Lane V/C Ratio	0.415	0.232
HCM Control Delay	10.8	9.5
HCM Lane LOS	B	A
HCM 95th-tile Q	2.1	0.9

Intersection	
Int Delay, s/veh	5.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	113	77	183	69	29	141
Future Vol, veh/h	113	77	183	69	29	141
Conflicting Peds, #/hr	0	0	0	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	110	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	7	19	4	5	0	4
Mvmt Flow	124	85	201	76	32	155

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	209	0	647	167
Stage 1	-	-	-	-	167	-
Stage 2	-	-	-	-	480	-
Critical Hdwy	-	-	4.14	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.236	-	3.5	3.336
Pot Cap-1 Maneuver	-	-	1350	-	439	872
Stage 1	-	-	-	-	867	-
Stage 2	-	-	-	-	627	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1350	-	370	872
Mov Cap-2 Maneuver	-	-	-	-	370	-
Stage 1	-	-	-	-	867	-
Stage 2	-	-	-	-	529	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.9	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	370	872	-	-	1350	-
HCM Lane V/C Ratio	0.086	0.178	-	-	0.149	-
HCM Control Delay (s)	15.6	10	-	-	8.1	0
HCM Lane LOS	C	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.6	-	-	0.5	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	255	804	18	223	1497	142	0	0	0	0	0	387
Future Vol, veh/h	255	804	18	223	1497	142	0	0	0	0	0	387
Conflicting Peds, #/hr	1	0	0	0	0	1	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	Free
Storage Length	520	-	390	380	-	325	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	2	1	5	2	0	7	0	3	0	0	0
Mvmt Flow	287	903	20	251	1682	160	0	0	0	0	0	435

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	1683	0	0	923	0	0				-	-	-
Stage 1	-	-	-	-	-	-				-	-	-
Stage 2	-	-	-	-	-	-				-	-	-
Critical Hdwy	4.1	-	-	4.2	-	-				-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-				-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				-	-	-
Follow-up Hdwy	2.2	-	-	2.25	-	-				-	-	-
Pot Cap-1 Maneuver	385	-	-	717	-	-				0	0	0
Stage 1	-	-	-	-	-	-				0	0	0
Stage 2	-	-	-	-	-	-				0	0	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	385	-	-	717	-	-				-	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-				-	0	-
Stage 1	-	-	-	-	-	-				-	0	-
Stage 2	-	-	-	-	-	-				-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	8.8	1.5	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	385	-	-	717	-	-	-
HCM Lane V/C Ratio	0.744	-	-	0.349	-	-	-
HCM Control Delay (s)	37.1	-	-	12.7	-	-	0
HCM Lane LOS	E	-	-	B	-	-	A
HCM 95th %tile Q(veh)	5.9	-	-	1.6	-	-	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	146	121	342	160	86	256
Future Volume (vph)	146	121	342	160	86	256
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3		5.0	5.3	5.0	5.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.94		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1732		1735	1827	1787	1516
Flt Permitted	1.00		0.35	1.00	0.95	1.00
Satd. Flow (perm)	1732		633	1827	1787	1516
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	160	133	376	176	95	281
RTOR Reduction (vph)	38	0	0	0	0	241
Lane Group Flow (vph)	255	0	376	176	95	40
Confl. Peds. (#/hr)		1	1			1
Heavy Vehicles (%)	2%	2%	4%	4%	1%	4%
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	3	
Permitted Phases			2			3
Actuated Green, G (s)	12.4		32.6	32.6	7.1	7.1
Effective Green, g (s)	12.4		32.6	32.6	7.1	7.1
Actuated g/C Ratio	0.25		0.65	0.65	0.14	0.14
Clearance Time (s)	5.3		5.0	5.3	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	429		747	1191	253	215
v/s Ratio Prot	0.15		c0.15	0.10	c0.05	
v/s Ratio Perm			c0.17			0.03
v/c Ratio	0.60		0.50	0.15	0.38	0.19
Uniform Delay, d1	16.6		4.6	3.4	19.4	18.9
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2		0.5	0.1	0.9	0.4
Delay (s)	18.8		5.2	3.4	20.4	19.3
Level of Service	B		A	A	C	B
Approach Delay (s)	18.8			4.6	19.6	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	21.3
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SER
Lane Configurations										
Traffic Vol, veh/h	1	0	1	259	0	0	119	340	0	0
Future Vol, veh/h	1	0	1	259	0	0	119	340	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	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	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	92	92
Heavy Vehicles, %	0	0	0	5	0	0	4	5	2	2
Mvmt Flow	1	0	1	294	0	0	135	386	0	0

Major/Minor	Minor1		Major1			Major2		
Conflicting Flow All	624	294	521	0	-	-	-	0
Stage 1	296	-	-	-	-	-	-	-
Stage 2	328	-	-	-	-	-	-	-
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	452	750	1056	-	0	0	-	-
Stage 1	759	-	-	-	0	0	-	-
Stage 2	734	-	-	-	0	0	-	-
Platoon blocked, %				-			-	-
Mov Cap-1 Maneuver	452	750	1056	-	-	-	-	-
Mov Cap-2 Maneuver	452	-	-	-	-	-	-	-
Stage 1	758	-	-	-	-	-	-	-
Stage 2	734	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1056	-	744	-	-
HCM Lane V/C Ratio	0.001	-	0.136	-	-
HCM Control Delay (s)	8.4	0	10.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	WBR	SBL	SBR	SEL
Lane Configurations				
Traffic Vol, veh/h	0	121	0	0
Future Vol, veh/h	0	121	0	0
Peak Hour Factor	0.88	0.88	0.88	0.84
Heavy Vehicles, %	0	3	0	0
Mvmt Flow	0	138	0	0
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	
Opposing Lanes	0
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	SE
Conflicting Lanes Right	1
HCM Control Delay	9
HCM LOS	A

Lane	SELn1	SBLn1
Vol Left, %	100%	100%
Vol Thru, %	0%	0%
Vol Right, %	0%	0%
Sign Control	Stop	Stop
Traffic Vol by Lane	259	121
LT Vol	259	121
Through Vol	0	0
RT Vol	0	0
Lane Flow Rate	294	138
Geometry Grp	1	1
Degree of Util (X)	0.375	0.186
Departure Headway (Hd)	4.587	4.872
Convergence, Y/N	Yes	Yes
Cap	786	738
Service Time	2.603	2.89
HCM Lane V/C Ratio	0.374	0.187
HCM Control Delay	10.3	9
HCM Lane LOS	B	A
HCM 95th-tile Q	1.7	0.7

HCM Analysis – No-Build

Intersection	
Int Delay, s/veh	6.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	35	15	95	20	15	135
Future Vol, veh/h	35	15	95	20	15	135
Conflicting Peds, #/hr	0	0	0	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	110	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	7	19	4	5	0	4
Mvmt Flow	42	18	113	24	18	161

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	60	0	303	51
Stage 1	-	-	-	-	51	-
Stage 2	-	-	-	-	252	-
Critical Hdwy	-	-	4.14	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.236	-	3.5	3.336
Pot Cap-1 Maneuver	-	-	1531	-	693	1011
Stage 1	-	-	-	-	977	-
Stage 2	-	-	-	-	795	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1531	-	640	1011
Mov Cap-2 Maneuver	-	-	-	-	640	-
Stage 1	-	-	-	-	977	-
Stage 2	-	-	-	-	734	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.2	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	640	1011	-	-	1531	-
HCM Lane V/C Ratio	0.028	0.159	-	-	0.074	-
HCM Control Delay (s)	10.8	9.2	-	-	7.5	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	0.6	-	-	0.2	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	175	1650	15	170	700	55	0	0	0	0	0	135
Future Vol, veh/h	175	1650	15	170	700	55	0	0	0	0	0	135
Conflicting Peds, #/hr	1	0	0	0	0	1	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	Free
Storage Length	520	-	390	380	-	325	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	2	1	5	2	0	7	0	3	0	0	0
Mvmt Flow	213	2012	18	207	854	67	0	0	0	0	0	165

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	855	0	0	2030	0	0	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.1	-	-	4.2	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.25	-	-	-	-	-
Pot Cap-1 Maneuver	793	-	-	264	-	-	0	0	0
Stage 1	-	-	-	-	-	-	0	0	0
Stage 2	-	-	-	-	-	-	0	0	0
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	793	-	-	264	-	-	-	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	10.1	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	793	-	-	264	-	-	-
HCM Lane V/C Ratio	0.269	-	-	0.785	-	-	-
HCM Control Delay (s)	11.2	-	-	54.9	-	-	0
HCM Lane LOS	B	-	-	F	-	-	A
HCM 95th %tile Q(veh)	1.1	-	-	6	-	-	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	90	95	280	75	40	325
Future Volume (vph)	90	95	280	75	40	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3		5.0	5.3	5.0	5.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.93		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1734		1736	1827	1787	1553
Flt Permitted	1.00		0.41	1.00	0.95	1.00
Satd. Flow (perm)	1734		744	1827	1787	1553
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	110	116	341	91	49	396
RTOR Reduction (vph)	47	0	0	0	0	317
Lane Group Flow (vph)	179	0	341	91	49	79
Heavy Vehicles (%)	2%	2%	4%	4%	1%	4%
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	3	
Permitted Phases			2			3
Actuated Green, G (s)	9.7		22.8	22.8	8.3	8.3
Effective Green, g (s)	9.7		22.8	22.8	8.3	8.3
Actuated g/C Ratio	0.23		0.55	0.55	0.20	0.20
Clearance Time (s)	5.3		5.0	5.3	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	406		603	1006	358	311
v/s Ratio Prot	0.10		c0.11	0.05	0.03	
v/s Ratio Perm			c0.20			c0.05
v/c Ratio	0.44		0.57	0.09	0.14	0.26
Uniform Delay, d1	13.5		5.6	4.4	13.6	13.9
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8		1.2	0.0	0.2	0.4
Delay (s)	14.3		6.9	4.4	13.8	14.4
Level of Service	B		A	A	B	B
Approach Delay (s)	14.3			6.3	14.3	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	41.4	Sum of lost time (s)	21.3
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SER
Lane Configurations										
Traffic Vol, veh/h	5	0	5	285	0	0	145	225	0	0
Future Vol, veh/h	5	0	5	285	0	0	145	225	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	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	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	92	92
Heavy Vehicles, %	0	0	0	5	0	0	4	5	2	2
Mvmt Flow	6	0	6	365	0	0	186	288	0	0

Major/Minor	Minor1		Major1			Major2		
Conflicting Flow All	707	365	474	0	-	-	-	0
Stage 1	377	-	-	-	-	-	-	-
Stage 2	330	-	-	-	-	-	-	-
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	405	685	1099	-	0	0	-	-
Stage 1	698	-	-	-	0	0	-	-
Stage 2	733	-	-	-	0	0	-	-
Platoon blocked, %				-			-	-
Mov Cap-1 Maneuver	402	685	1099	-	-	-	-	-
Mov Cap-2 Maneuver	402	-	-	-	-	-	-	-
Stage 1	693	-	-	-	-	-	-	-
Stage 2	733	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1099	-	685	-	-
HCM Lane V/C Ratio	0.006	-	0.15	-	-
HCM Control Delay (s)	8.3	0	11.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection	
Intersection Delay, s/veh	10.6
Intersection LOS	B

Movement	WBR	SBL	SBR	SEL
Lane Configurations				
Traffic Vol, veh/h	0	150	0	5
Future Vol, veh/h	0	150	0	5
Peak Hour Factor	0.84	0.84	0.84	0.84
Heavy Vehicles, %	0	3	0	0
Mvmt Flow	0	179	0	6
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	
Opposing Lanes	0
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	SE
Conflicting Lanes Right	1
HCM Control Delay	9.7
HCM LOS	A

Lane	SELn1	SBLn1
Vol Left, %	100%	100%
Vol Thru, %	0%	0%
Vol Right, %	0%	0%
Sign Control	Stop	Stop
Traffic Vol by Lane	290	150
LT Vol	290	150
Through Vol	0	0
RT Vol	0	0
Lane Flow Rate	345	179
Geometry Grp	1	1
Degree of Util (X)	0.438	0.247
Departure Headway (Hd)	4.565	4.984
Convergence, Y/N	Yes	Yes
Cap	791	721
Service Time	2.586	3.014
HCM Lane V/C Ratio	0.436	0.248
HCM Control Delay	11.1	9.7
HCM Lane LOS	B	A
HCM 95th-tile Q	2.2	1

Intersection	
Int Delay, s/veh	5.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	120	80	190	75	30	145
Future Vol, veh/h	120	80	190	75	30	145
Conflicting Peds, #/hr	0	0	0	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	110	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	7	19	4	5	0	4
Mvmt Flow	132	88	209	82	33	159

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	220	0	678	176
Stage 1	-	-	-	-	176	-
Stage 2	-	-	-	-	502	-
Critical Hdwy	-	-	4.14	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.236	-	3.5	3.336
Pot Cap-1 Maneuver	-	-	1337	-	421	862
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	612	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1337	-	351	862
Mov Cap-2 Maneuver	-	-	-	-	351	-
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	510	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.9	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	351	862	-	-	1337	-
HCM Lane V/C Ratio	0.094	0.185	-	-	0.156	-
HCM Control Delay (s)	16.3	10.1	-	-	8.2	0
HCM Lane LOS	C	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	0.7	-	-	0.6	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	265	825	20	230	1535	150	0	0	0	0	0	400
Future Vol, veh/h	265	825	20	230	1535	150	0	0	0	0	0	400
Conflicting Peds, #/hr	1	0	0	0	0	1	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	Free
Storage Length	520	-	390	380	-	325	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	2	1	5	2	0	7	0	3	0	0	0
Mvmt Flow	298	927	22	258	1725	169	0	0	0	0	0	449

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	1726	0	0	949	0	0				-	-	-
Stage 1	-	-	-	-	-	-				-	-	-
Stage 2	-	-	-	-	-	-				-	-	-
Critical Hdwy	4.1	-	-	4.2	-	-				-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-				-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				-	-	-
Follow-up Hdwy	2.2	-	-	2.25	-	-				-	-	-
Pot Cap-1 Maneuver	371	-	-	701	-	-				0	0	0
Stage 1	-	-	-	-	-	-				0	0	0
Stage 2	-	-	-	-	-	-				0	0	0
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	371	-	-	701	-	-				-	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-				-	0	-
Stage 1	-	-	-	-	-	-				-	0	-
Stage 2	-	-	-	-	-	-				-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	10.6	1.6	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	371	-	-	701	-	-	-
HCM Lane V/C Ratio	0.803	-	-	0.369	-	-	-
HCM Control Delay (s)	44.3	-	-	13.1	-	-	0
HCM Lane LOS	E	-	-	B	-	-	A
HCM 95th %tile Q(veh)	6.9	-	-	1.7	-	-	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	150	125	355	165	90	265
Future Volume (vph)	150	125	355	165	90	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3		5.0	5.3	5.0	5.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frpb, ped/bikes	0.99		1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.94		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1732		1735	1827	1787	1517
Flt Permitted	1.00		0.36	1.00	0.95	1.00
Satd. Flow (perm)	1732		666	1827	1787	1517
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	165	137	390	181	99	291
RTOR Reduction (vph)	40	0	0	0	0	243
Lane Group Flow (vph)	262	0	390	181	99	48
Confl. Peds. (#/hr)		1	1			1
Heavy Vehicles (%)	2%	2%	4%	4%	1%	4%
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	3	
Permitted Phases			2			3
Actuated Green, G (s)	11.4		25.4	25.4	7.0	7.0
Effective Green, g (s)	11.4		25.4	25.4	7.0	7.0
Actuated g/C Ratio	0.27		0.59	0.59	0.16	0.16
Clearance Time (s)	5.3		5.0	5.3	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	462		621	1086	292	248
v/s Ratio Prot	0.15		c0.13	0.10	c0.06	
v/s Ratio Perm			c0.24			0.03
v/c Ratio	0.57		0.63	0.17	0.34	0.19
Uniform Delay, d1	13.5		5.2	3.9	15.8	15.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.6		2.0	0.1	0.7	0.4
Delay (s)	15.1		7.2	4.0	16.5	15.8
Level of Service	B		A	A	B	B
Approach Delay (s)	15.1			6.2	16.0	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	42.7	Sum of lost time (s)	21.3
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SER
Lane Configurations										
Traffic Vol, veh/h	5	0	5	270	0	0	125	350	0	0
Future Vol, veh/h	5	0	5	270	0	0	125	350	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	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	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	92	92
Heavy Vehicles, %	0	0	0	5	0	0	4	5	2	2
Mvmt Flow	6	0	6	307	0	0	142	398	0	0

Major/Minor	Minor1		Major1			Major2		
Conflicting Flow All	660	307	540	0	-	-	-	0
Stage 1	319	-	-	-	-	-	-	-
Stage 2	341	-	-	-	-	-	-	-
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	431	738	1039	-	0	0	-	-
Stage 1	741	-	-	-	0	0	-	-
Stage 2	725	-	-	-	0	0	-	-
Platoon blocked, %				-			-	-
Mov Cap-1 Maneuver	428	738	1039	-	-	-	-	-
Mov Cap-2 Maneuver	428	-	-	-	-	-	-	-
Stage 1	736	-	-	-	-	-	-	-
Stage 2	725	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1039	-	712	-	-
HCM Lane V/C Ratio	0.005	-	0.16	-	-
HCM Control Delay (s)	8.5	0	11	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	WBR	SBL	SBR	SEL
Lane Configurations				
Traffic Vol, veh/h	0	125	0	0
Future Vol, veh/h	0	125	0	0
Peak Hour Factor	0.88	0.88	0.88	0.84
Heavy Vehicles, %	0	3	0	0
Mvmt Flow	0	142	0	0
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	
Opposing Lanes	0
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	SE
Conflicting Lanes Right	1
HCM Control Delay	9.1
HCM LOS	A

Lane	SELn1	SBLn1
Vol Left, %	100%	100%
Vol Thru, %	0%	0%
Vol Right, %	0%	0%
Sign Control	Stop	Stop
Traffic Vol by Lane	270	125
LT Vol	270	125
Through Vol	0	0
RT Vol	0	0
Lane Flow Rate	307	142
Geometry Grp	1	1
Degree of Util (X)	0.392	0.193
Departure Headway (Hd)	4.601	4.904
Convergence, Y/N	Yes	Yes
Cap	785	733
Service Time	2.617	2.923
HCM Lane V/C Ratio	0.391	0.194
HCM Control Delay	10.6	9.1
HCM Lane LOS	B	A
HCM 95th-tile Q	1.9	0.7

HCM Analysis – Build

Intersection	
Int Delay, s/veh	6.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	39	15	132	32	15	152
Future Vol, veh/h	39	15	132	32	15	152
Conflicting Peds, #/hr	0	0	0	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	110	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	7	19	4	5	0	4
Mvmt Flow	46	18	157	38	18	181

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	64	0	409	55
Stage 1	-	-	-	-	55	-
Stage 2	-	-	-	-	354	-
Critical Hdwy	-	-	4.14	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.236	-	3.5	3.336
Pot Cap-1 Maneuver	-	-	1526	-	602	1006
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	715	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1526	-	538	1006
Mov Cap-2 Maneuver	-	-	-	-	538	-
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	638	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.1	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	538	1006	-	-	1526	-
HCM Lane V/C Ratio	0.033	0.18	-	-	0.103	-
HCM Control Delay (s)	11.9	9.4	-	-	7.6	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	0.7	-	-	0.3	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	184	1652	15	170	700	63	0	0	0	0	0	172
Future Vol, veh/h	184	1652	15	170	700	63	0	0	0	0	0	172
Conflicting Peds, #/hr	1	0	0	0	0	1	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	Free
Storage Length	520	-	390	380	-	325	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	2	1	5	2	0	7	0	3	0	0	0
Mvmt Flow	224	2015	18	207	854	77	0	0	0	0	0	210

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	855	0	0	2033	0	0	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.1	-	-	4.2	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.25	-	-	-	-	-
Pot Cap-1 Maneuver	793	-	-	264	-	-	0	0	0
Stage 1	-	-	-	-	-	-	0	0	0
Stage 2	-	-	-	-	-	-	0	0	0
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	793	-	-	264	-	-	-	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	10	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	793	-	-	264	-	-	-
HCM Lane V/C Ratio	0.283	-	-	0.785	-	-	-
HCM Control Delay (s)	11.3	-	-	54.9	-	-	0
HCM Lane LOS	B	-	-	F	-	-	A
HCM 95th %tile Q(veh)	1.2	-	-	6	-	-	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	102	156	280	79	54	325
Future Volume (vph)	102	156	280	79	54	325
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3		5.0	5.3	5.0	5.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.92		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1745		1805	1900	1805	1615
Flt Permitted	1.00		0.32	1.00	0.95	1.00
Satd. Flow (perm)	1745		608	1900	1805	1615
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	124	190	341	96	66	396
RTOR Reduction (vph)	65	0	0	0	0	338
Lane Group Flow (vph)	249	0	341	96	66	58
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	3	
Permitted Phases			2			3
Actuated Green, G (s)	12.0		31.3	31.3	7.1	7.1
Effective Green, g (s)	12.0		31.3	31.3	7.1	7.1
Actuated g/C Ratio	0.25		0.64	0.64	0.15	0.15
Clearance Time (s)	5.3		5.0	5.3	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	429		742	1221	263	235
v/s Ratio Prot	c0.14		c0.13	0.05	c0.04	
v/s Ratio Perm			0.16			0.04
v/c Ratio	0.58		0.46	0.08	0.25	0.25
Uniform Delay, d1	16.1		4.7	3.3	18.4	18.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0		0.5	0.0	0.5	0.5
Delay (s)	18.1		5.1	3.3	18.9	19.0
Level of Service	B		A	A	B	B
Approach Delay (s)	18.1			4.7	19.0	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	48.7	Sum of lost time (s)	21.3
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SER
Lane Configurations										
Traffic Vol, veh/h	5	0	5	287	0	0	206	225	0	0
Future Vol, veh/h	5	0	5	287	0	0	206	225	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	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	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	92	92
Heavy Vehicles, %	0	0	0	5	0	0	4	5	2	2
Mvmt Flow	6	0	6	368	0	0	264	288	0	0

Major/Minor	Minor1		Major1			Major2		
Conflicting Flow All	788	368	552	0	-	-	-	0
Stage 1	380	-	-	-	-	-	-	-
Stage 2	408	-	-	-	-	-	-	-
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	363	682	1028	-	0	0	-	-
Stage 1	696	-	-	-	0	0	-	-
Stage 2	676	-	-	-	0	0	-	-
Platoon blocked, %				-			-	-
Mov Cap-1 Maneuver	360	682	1028	-	-	-	-	-
Mov Cap-2 Maneuver	360	-	-	-	-	-	-	-
Stage 1	691	-	-	-	-	-	-	-
Stage 2	676	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1028	-	682	-	-
HCM Lane V/C Ratio	0.006	-	0.173	-	-
HCM Control Delay (s)	8.5	0	11.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Intersection	
Intersection Delay, s/veh	11.7
Intersection LOS	B

Movement	WBR	SBL	SBR	SEL
Lane Configurations				
Traffic Vol, veh/h	0	211	0	5
Future Vol, veh/h	0	211	0	5
Peak Hour Factor	0.84	0.84	0.84	0.84
Heavy Vehicles, %	0	3	0	0
Mvmt Flow	0	251	0	6
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	
Opposing Lanes	0
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	SE
Conflicting Lanes Right	1
HCM Control Delay	10.8
HCM LOS	B

Lane	SELn1	SBLn1
Vol Left, %	100%	100%
Vol Thru, %	0%	0%
Vol Right, %	0%	0%
Sign Control	Stop	Stop
Traffic Vol by Lane	292	211
LT Vol	292	211
Through Vol	0	0
RT Vol	0	0
Lane Flow Rate	348	251
Geometry Grp	1	1
Degree of Util (X)	0.472	0.352
Departure Headway (Hd)	4.891	5.041
Convergence, Y/N	Yes	Yes
Cap	737	713
Service Time	2.93	3.081
HCM Lane V/C Ratio	0.472	0.352
HCM Control Delay	12.3	10.8
HCM Lane LOS	B	B
HCM 95th-tile Q	2.5	1.6

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	21	150	90	18	73	49
Future Vol, veh/h	21	150	90	18	73	49
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	25	176	106	21	86	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	132	0	-	0	353	127
Stage 1	-	-	-	-	122	-
Stage 2	-	-	-	-	231	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1435	-	-	-	639	915
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	800	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1428	-	-	-	620	906
Mov Cap-2 Maneuver	-	-	-	-	620	-
Stage 1	-	-	-	-	874	-
Stage 2	-	-	-	-	796	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	11.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1428	-	-	-	710
HCM Lane V/C Ratio	0.017	-	-	-	0.202
HCM Control Delay (s)	7.6	0	-	-	11.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8

Intersection	
Int Delay, s/veh	6.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	133	80	214	83	30	206
Future Vol, veh/h	133	80	214	83	30	206
Conflicting Peds, #/hr	0	0	0	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	Yield
Storage Length	-	-	-	-	110	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	7	19	4	5	0	4
Mvmt Flow	146	88	235	91	33	226

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	234	0	753	190
Stage 1	-	-	-	-	190	-
Stage 2	-	-	-	-	563	-
Critical Hdwy	-	-	4.14	-	6.4	6.24
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.236	-	3.5	3.336
Pot Cap-1 Maneuver	-	-	1322	-	380	847
Stage 1	-	-	-	-	847	-
Stage 2	-	-	-	-	574	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1322	-	308	847
Mov Cap-2 Maneuver	-	-	-	-	308	-
Stage 1	-	-	-	-	847	-
Stage 2	-	-	-	-	466	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6	11.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	308	847	-	-	1322	-
HCM Lane V/C Ratio	0.107	0.267	-	-	0.178	-
HCM Control Delay (s)	18.1	10.8	-	-	8.3	0
HCM Lane LOS	C	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	1.1	-	-	0.6	-

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	299	832	20	230	1535	177	0	0	0	0	0	424
Future Vol, veh/h	299	832	20	230	1535	177	0	0	0	0	0	424
Conflicting Peds, #/hr	1	0	0	0	0	1	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Yield	-	-	None	-	-	Free
Storage Length	520	-	390	380	-	325	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	2	1	5	2	0	7	0	3	0	0	0
Mvmt Flow	336	935	22	258	1725	199	0	0	0	0	0	476

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	1726	0	0	957	0	0	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.1	-	-	4.2	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.2	-	-	2.25	-	-	-	-	-
Pot Cap-1 Maneuver	371	-	-	696	-	-	0	0	0
Stage 1	-	-	-	-	-	-	0	0	0
Stage 2	-	-	-	-	-	-	0	0	0
Platoon blocked, %		-	-		-	-			
Mov Cap-1 Maneuver	371	-	-	696	-	-	-	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	0	-
Stage 1	-	-	-	-	-	-	-	0	-
Stage 2	-	-	-	-	-	-	-	0	-

Approach	EB	WB	SB
HCM Control Delay, s	15.5	1.6	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	371	-	-	696	-	-	-
HCM Lane V/C Ratio	0.906	-	-	0.371	-	-	-
HCM Control Delay (s)	59.8	-	-	13.2	-	-	0
HCM Lane LOS	F	-	-	B	-	-	A
HCM 95th %tile Q(veh)	9.2	-	-	1.7	-	-	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	158	166	355	178	137	265
Future Volume (vph)	158	166	355	178	137	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3		5.0	5.3	5.0	5.0
Lane Util. Factor	1.00		1.00	1.00	1.00	1.00
Frt	0.93		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	1769		1805	1900	1805	1615
Flt Permitted	1.00		0.30	1.00	0.95	1.00
Satd. Flow (perm)	1769		568	1900	1805	1615
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	174	182	390	196	151	291
RTOR Reduction (vph)	46	0	0	0	0	249
Lane Group Flow (vph)	310	0	390	196	151	42
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	6		5	2	3	
Permitted Phases			2			3
Actuated Green, G (s)	13.5		31.5	31.5	7.0	7.0
Effective Green, g (s)	13.5		31.5	31.5	7.0	7.0
Actuated g/C Ratio	0.28		0.65	0.65	0.14	0.14
Clearance Time (s)	5.3		5.0	5.3	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	489		696	1226	258	231
v/s Ratio Prot	0.18		c0.15	0.10	c0.08	
v/s Ratio Perm			c0.21			0.03
v/c Ratio	0.63		0.56	0.16	0.59	0.18
Uniform Delay, d1	15.5		5.1	3.4	19.5	18.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7		1.0	0.1	3.4	0.4
Delay (s)	18.2		6.1	3.5	22.9	18.8
Level of Service	B		A	A	C	B
Approach Delay (s)	18.2			5.2	20.2	
Approach LOS	B			A	C	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	48.8	Sum of lost time (s)	21.3
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SER
Lane Configurations										
Traffic Vol, veh/h	5	0	5	277	0	0	166	350	0	0
Future Vol, veh/h	5	0	5	277	0	0	166	350	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	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	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	92	92
Heavy Vehicles, %	0	0	0	5	0	0	4	5	2	2
Mvmt Flow	6	0	6	315	0	0	189	398	0	0

Major/Minor	Minor1		Major1			Major2		
Conflicting Flow All	715	315	587	0	-	-	-	0
Stage 1	327	-	-	-	-	-	-	-
Stage 2	388	-	-	-	-	-	-	-
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	400	730	998	-	0	0	-	-
Stage 1	735	-	-	-	0	0	-	-
Stage 2	690	-	-	-	0	0	-	-
Platoon blocked, %				-			-	-
Mov Cap-1 Maneuver	397	730	998	-	-	-	-	-
Mov Cap-2 Maneuver	397	-	-	-	-	-	-	-
Stage 1	730	-	-	-	-	-	-	-
Stage 2	690	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	998	-	730	-	-
HCM Lane V/C Ratio	0.006	-	0.21	-	-
HCM Control Delay (s)	8.6	0	11.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

Intersection	
Intersection Delay, s/veh	10.5
Intersection LOS	B

Movement	WBR	SBL	SBR	SEL
Lane Configurations				
Traffic Vol, veh/h	0	166	0	0
Future Vol, veh/h	0	166	0	0
Peak Hour Factor	0.88	0.88	0.88	0.88
Heavy Vehicles, %	0	3	0	8
Mvmt Flow	0	189	0	0
Number of Lanes	0	1	0	1

Approach	SB
Opposing Approach	
Opposing Lanes	0
Conflicting Approach Left	
Conflicting Lanes Left	0
Conflicting Approach Right	SE
Conflicting Lanes Right	1
HCM Control Delay	9.7
HCM LOS	A

Lane	SELn1	SBLn1
Vol Left, %	100%	100%
Vol Thru, %	0%	0%
Vol Right, %	0%	0%
Sign Control	Stop	Stop
Traffic Vol by Lane	277	166
LT Vol	277	166
Through Vol	0	0
RT Vol	0	0
Lane Flow Rate	315	189
Geometry Grp	1	1
Degree of Util (X)	0.413	0.259
Departure Headway (Hd)	4.721	4.937
Convergence, Y/N	Yes	Yes
Cap	762	728
Service Time	2.747	2.965
HCM Lane V/C Ratio	0.413	0.26
HCM Control Delay	11	9.7
HCM Lane LOS	B	A
HCM 95th-tile Q	2	1

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	74	250	240	60	49	32
Future Vol, veh/h	74	250	240	60	49	32
Conflicting Peds, #/hr	5	0	0	5	5	5
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	91	91	91	91	91	91
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	81	275	264	66	54	35

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	335	0	-	0	744	307
Stage 1	-	-	-	-	302	-
Stage 2	-	-	-	-	442	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1208	-	-	-	378	726
Stage 1	-	-	-	-	743	-
Stage 2	-	-	-	-	641	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1202	-	-	-	344	719
Mov Cap-2 Maneuver	-	-	-	-	344	-
Stage 1	-	-	-	-	680	-
Stage 2	-	-	-	-	638	-

Approach	EB	WB	SB
HCM Control Delay, s	1.9	0	15.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1202	-	-	-	433
HCM Lane V/C Ratio	0.068	-	-	-	0.206
HCM Control Delay (s)	8.2	0	-	-	15.5
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.8