APPENDIX D

VOIGT DRIVE PARKING STRUCTURE TRANSPORTATION ANALYSIS (LLG 2017)

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engineers

Voigt Drive Parking Structure Transportation Analysis

University of California, San Diego
July 12, 2017

LLG Reference: 3-16-2681

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TABLE OF CONTENTS

SECTION PAGE

APPENDICES

APPENDIX

LIST OF FIGURES

SECTION—FIGURE # PAGE

LIST OF TABLES

SECTION—TABLE # PAGE

UNIVERSITY OF CALIFORNIA, SAN DIEGO
VOIGT DRIVE PARKING STRUCTURE TRANSPORTATION ANALYSIS

La Jolla, California
July 11, 2017

1.0 INTRODUCTION

Linscott, Law & Greenspan Engineers (LLG) has prepared this transportation study to evaluate and provide recommendations to accommodate the additional traffic that will be attracted to the proposed parking structure on the University of California, San Diego (UCSD) campus. The proposed structure is located within the central part of the campus, on the southwest corner of Voigt Drive and Engineer Lane.

Included in this traffic study are the following:

- Existing Conditions Discussion
- Trip Attraction/Distribution
- Near-Term Analysis
- Recommendations

Figure 1–1 shows the vicinity map. ***Figure 1–2*** shows a more detailed project area map.

1.1 Purpose of Report

The purpose of this report is to determine the additional traffic that will be attracted to the proposed parking structure, evaluate the effects of the additional traffic on the operations at nearby key intersections and provide recommendations to improve transportation circulation.

1.2 Project Description

The project proposes to replace Parking Lot P503 (50 Parking Stalls) and Parking Lot P502 (355 Parking Stalls) with a multi-level parking structure. The parking structure is expected to be occupied primarily by faculty and staff and proposes to accommodate between 600 and 1,000 vehicles. See ***Figure 1–3*** for the preliminary site plan. The project proposes right-in / right-out access along Voigt Drive and full access along Engineer Lane. Two access alternatives were also analyzed. All three access scenarios are described below:

- Project Access – Right-in / Right-out Access via Voigt Drive & Full Minor Street Access
- Alternative Access Option 1 – Right-in Only Access via Voigt Drive & Full Minor Street Access
- Alternative Access Option 2 – No Access via Voigt Drive & Two Full Minor Street Access

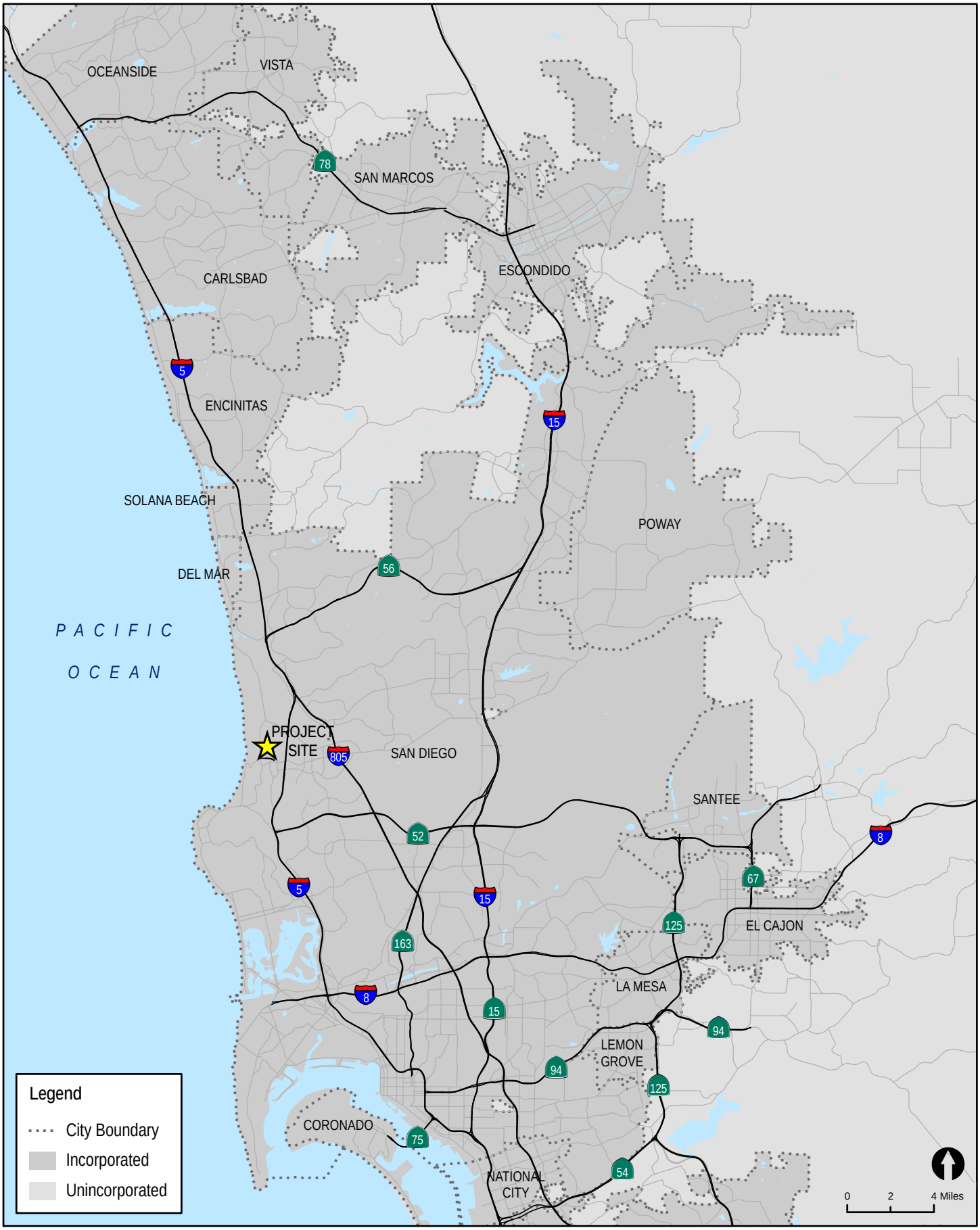

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Figure 1-1

Vicinity Map

Voigt Drive Parking Structure

No Scale

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Figure 1-2

Project Area Map

VOIGT DRIVE PARKING STRUCTURE

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Figure 1–3

Project Site Diagram

VOIGT DRIVE PARKING STRUCTURE

2.0 EXISTING CONDITIONS

2.1 Existing Street Network

The following is a brief description of the existing street network in the study area.

Voigt Drive, between Equality Lane and Hopkins Lane is a two-lane undivided roadway within the UCSD campus. Parallel on-street parking is permitted on the north side of the roadway between Engineer Lane and Hopkins Lane. The posted speed limit is 35 mph.

Engineer Lane is a two-lane undivided roadway located within the UCSD campus. Engineer Lane terminates approximately 500 south of Voigt Drive. P503 can be accessed through an unnamed street (herein referred to as "A" Street).

The following intersections were analyzed in this study:

- Voigt Drive / Hopkins Lane
- Voigt Drive / Engineer Lane
- Voigt Drive / Equality Lane
- Engineer Lane / "A" Street

Figure 2–1 shows an existing conditions diagram, including intersection control and lane configurations.

2.2 Existing Bicycle Network

Currently, there are Class II bicycle facilities along Voigt Drive, between Hopkins Lane and Equality Lane. Due to on-street parking on the north side of Voigt Drive between Engineer Lane and Hopkins Lane, westbound shared lane markings (also known as Sharrows) are provided.

Voigt Drive looking west from Engineer Lane

Voigt Drive looking east from Engineer Lane

Based on a review of the UCSD *Bicycle and Pedestrian Master Planning Study*, recommended improvements in the vicinity include the Library Walk Bicycle Bypass. ***Appendix A*** contains the excerpts of the study.

Figure 2–1 shows the existing bicycle network.

2.3 Existing Pedestrian Network

Sidewalks are provided on both sides of Voigt Drive. Sidewalks are also provided on both sides of Engineer Lane, however, the east side sidewalk on Engineer Lane terminates approximately 330 feet south of Voigt Drive and the west side sidewalk ends about 200 feet south of Voigt Drive. Sidewalks are provided on the south side of "A" Street. While curb ramps are provided at the intersection of Voigt Drive / Engineer Lane and Engineer Lane / "A" Street, detectable warning surfaces (i.e. truncated domes) are not provided.

Voigt Drive, looking east

Engineer Lane, looking south

"A" Street, looking west

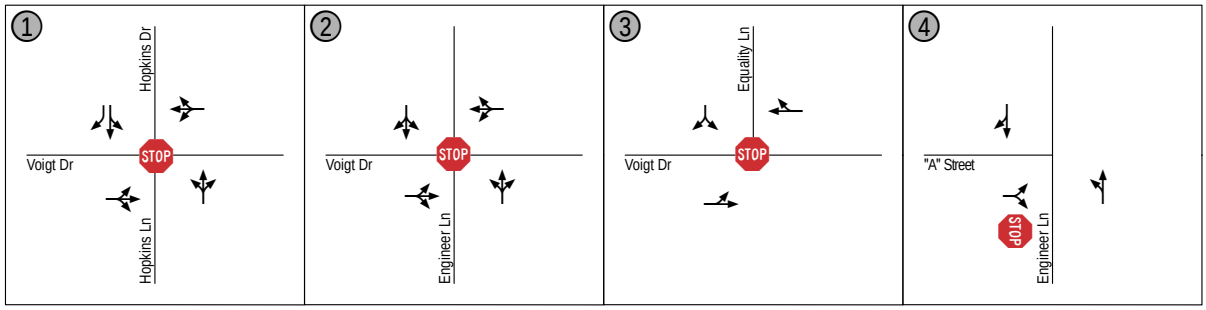
Based on a review of the UCSD *Bicycle and Pedestrian Master Planning Study*, recommended improvements in the vicinity include the Hopkins Lane Walkway and the Warren College Crosswalk. *Appendix A* contains the excerpts of the study.

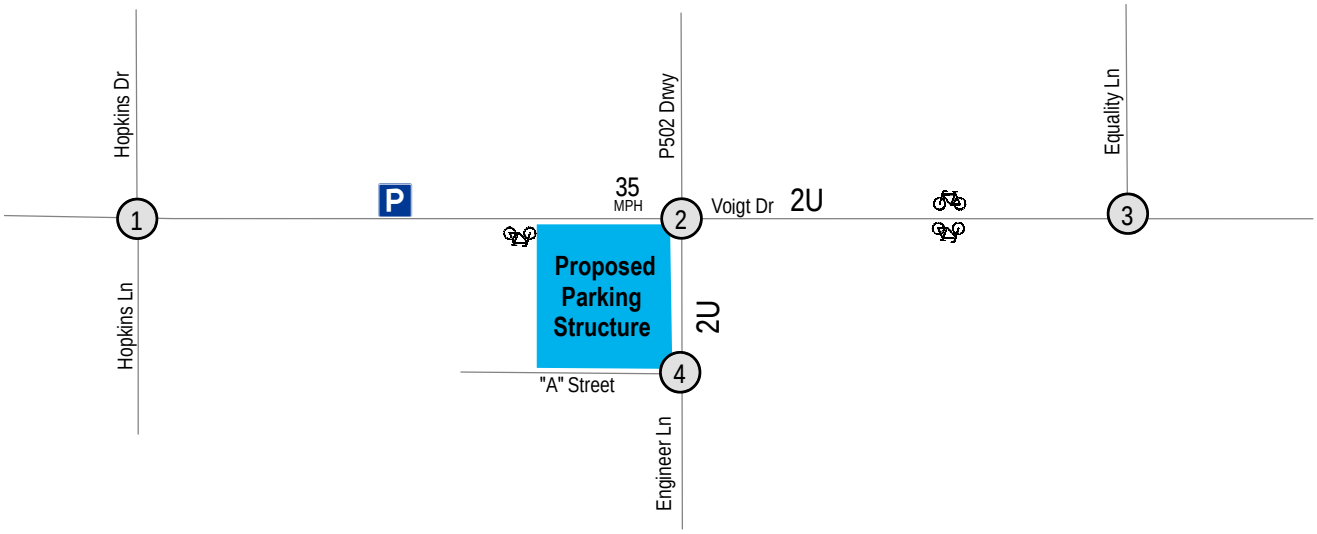
Figure 2–2 shows the existing pedestrian network.

2.4 Existing Traffic Volumes

Turning movement counts at the four (4) study area intersections, including bicycle and pedestrian counts, were conducted in October 2016 between the hours of 7:00-9:00 AM and 4:00-6:00 PM.

Figure 2–3 shows the existing traffic volumes. ***Appendix B*** contains the count sheets.





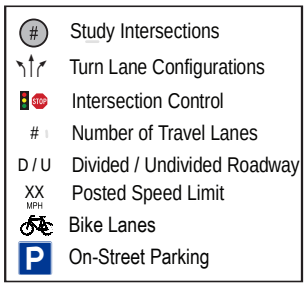


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Figure 2-1

Exising Conditions

Voigt Drive Parking Structure

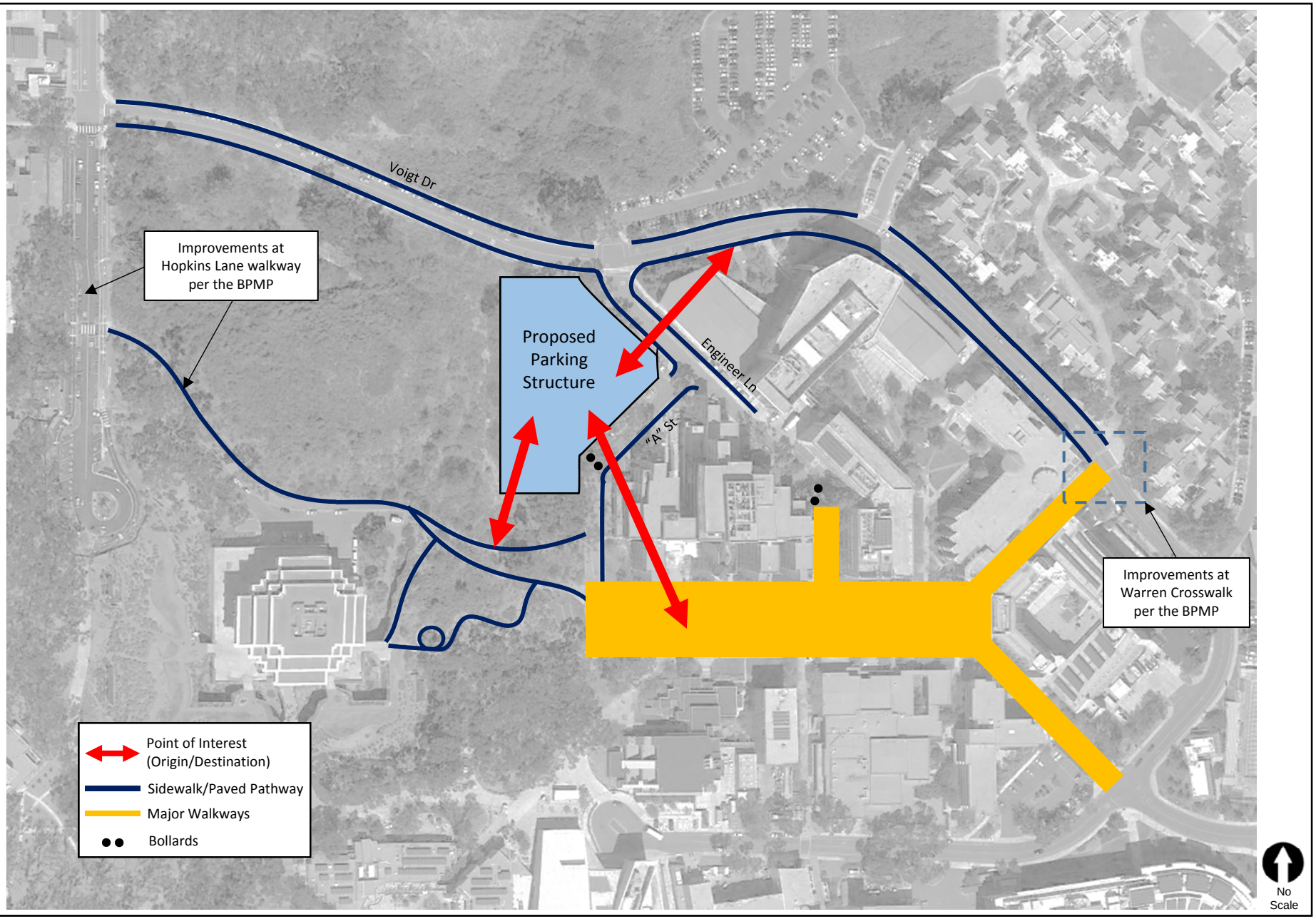

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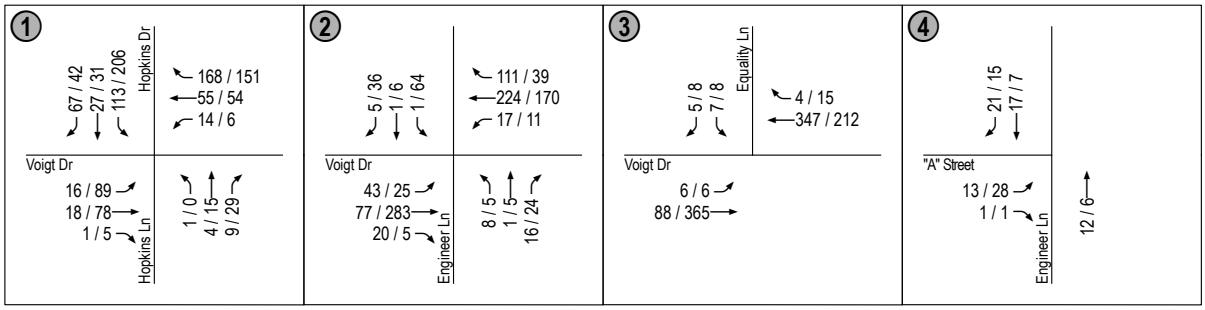
Figure 2–2

Pedestrian Circulation

VOIGT DRIVE PARKING STRUCTURE



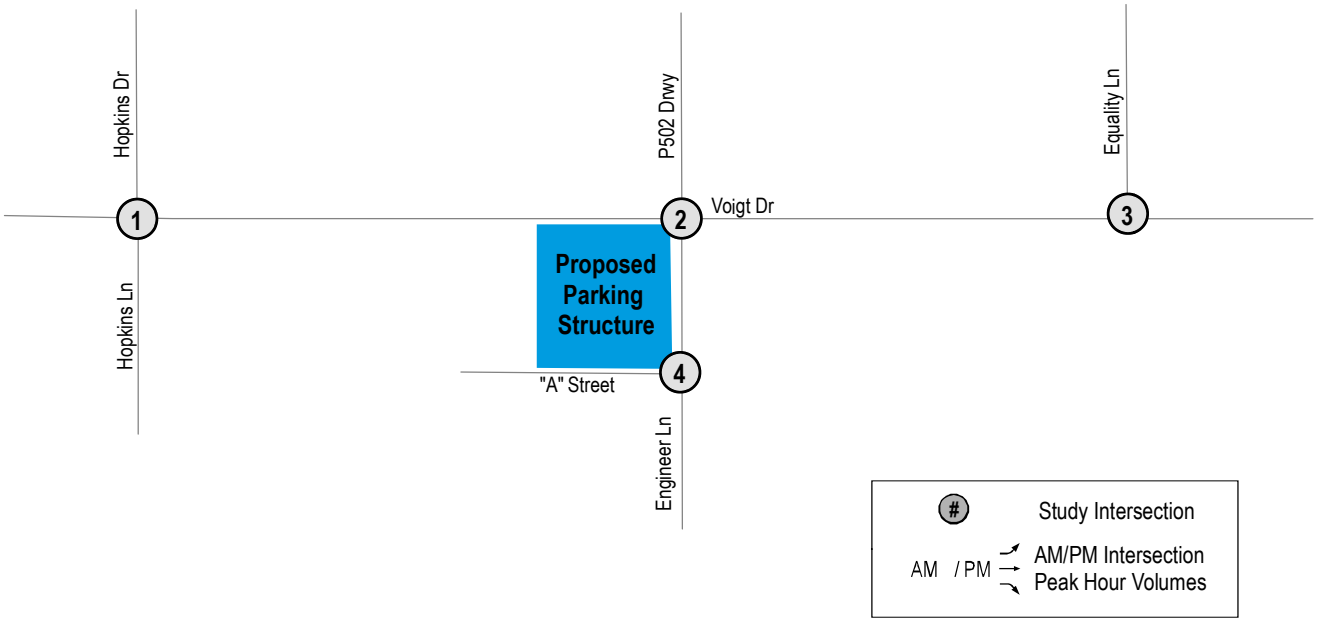


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Figure 2-3

Existing Volumes

Voigt Drive Parking Structure

3.0 TRIP ATTRACTION/DISTRIBUTION/ASSIGNMENT

3.1 Trip Attraction

The trip attraction rate for the proposed parking structure was determined by calculating the trip rate associated with a parking lot or parking structure of similar operating characteristics and forming a trip ratio with the number of current stalls. Traffic counts were conducted at Parking Lot P502 and a site-specific trip rate was calculated. Based on the methodology above, the calculated trip rate for the proposed parking structure is 4.9 ADT/stall.

For the purposes of the analysis, it was assumed that the capacity of the parking structure is 1,000 parking stalls, which represents the worst-case scenario. ***Table 3–1*** tabulates the total project traffic attraction for 1,000 stall scenario. Since the proposed parking structure is replacing Parking Lot P503 parking lot, trip credit is applied and subtracted from the proposed parking structure traffic. It should be noted that the proposed parking structure is also replacing Parking Lot P502. However, no trip credit is applied since the traffic needs to be redistributed based on the assumed network changes due to the proposed project, namely the removal of the north leg of the Voigt Drive / Engineer Lane intersection.

As seen in *Table 3–1*, the parking structure is calculated to yield a net project traffic amount of 4,655 ADT with 376 additional inbound / 20 additional outbound trips during the AM peak hour and 146 additional inbound / 297 additional outbound trips during the PM peak hour.

3.2 Trip Distribution

The project generated traffic was distributed to the street system based the project's proximity to state highways and arterials and existing traffic patterns. ***Figure 3–1*** shows the project traffic distribution.

3.3 Access Options & Trip Assignment

The additional traffic attracted by the project was assigned based on the anticipated traffic patterns for the following access scenarios:

- Project Access – Right-in / Right-out Access via Voigt Drive and Full Minor Street Access
- Alternative Access Option 1 – Right-in Only Access via Voigt Drive and Full Minor Street Access
- Alternative Access Option 2 – No Access via Voigt Drive and Two Full Minor Street Access

Figure 3–2 illustrates the above access scenarios.

It should be noted that the location of the full access driveways for both alternative options is flexible such that the full access driveway in Option 1 may be constructed along Engineer Lane instead of "A" Street and the two full access driveways in Option 2 may be constructed along "A" Street.

For analysis purposes, the following were assumed and project traffic volumes were assigned accordingly:

- Project Access & Both Alternative Options: Voigt Drive / Engineer Lane is converted into a T-intersection.
- Project Access: Right-in / Right-out Access via Voigt Drive and Full Access is along Engineer Lane.
- Alternative Access Option 1: Right-in Only Access via Voigt Drive and Full Access Driveway is along "A" Street
- Alternative Access Option 2: Both Full Access Driveways are along "A" Street.

Figure 3–3 shows the project traffic volumes for each access scenario. ***Figure 3–4*** shows the existing + project traffic volumes for each access scenario.

TABLE 3–1
PROJECT TRIP ATTRACTION

Land Use	Quantity	Daily Trip Ends (ADT)		AM Peak Hour					PM Peak Hour				
		Rate [a]	Volume	% of ADT	In:Out Split	Volume In	Volume Out	Volume Total	% of ADT	In:Out Split	Volume In	Volume Out	Volume Total
Parking Structure	1,000 stalls	4.9 / stall	4,900	8.5%	95 : 5	396	21	417	9.5%	33 : 67	154	312	466
P503 Trip Credit	50 stalls	4.9 / stall	-245	8.5%	95 : 5	-20	-1	-21	9.5%	33 : 67	-8	-15	-23
Total			**4,655**			**376**	**20**	**396**				**146**	**297**

Footnotes:

a. Rate is based on site specific trip rate described in *Section 6.1*.

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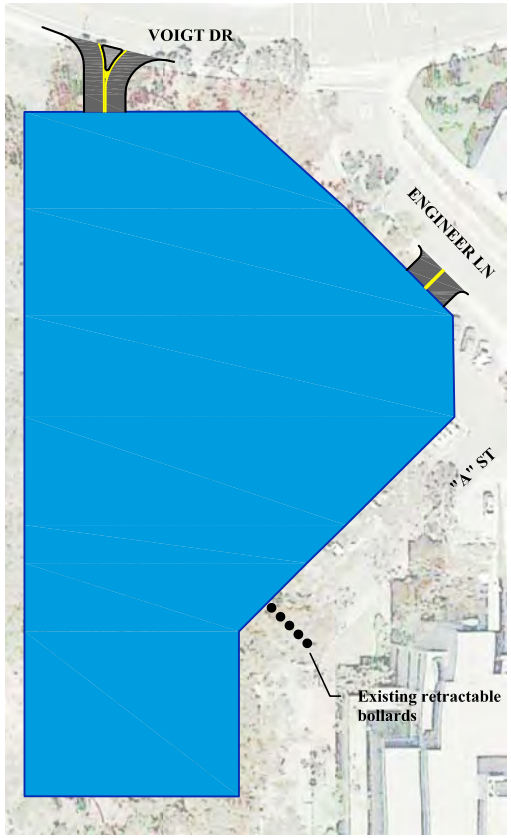
Figure 3-1

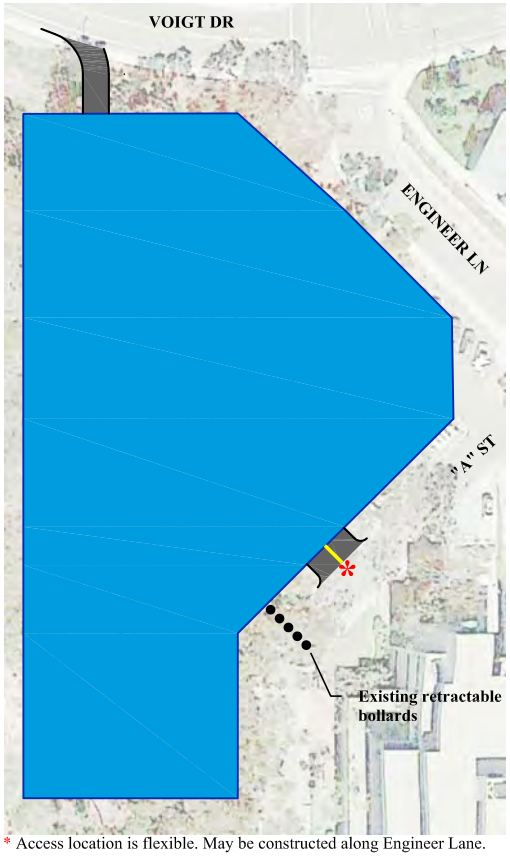
Project Traffic Distribution

Voigt Drive Parking Structure

Project Access
Right-in /Right-out via Voigt Drive and Full Minor Street Access

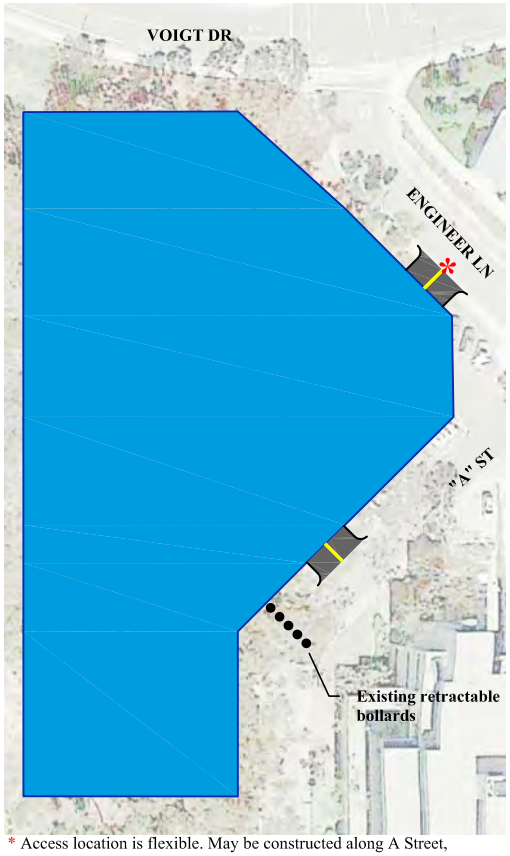


Alternative Access - Option 1
Right-In Only via Voigt Drive and Full Minor Access



* Access location is flexible. May be constructed along Engineer Lane. However, analysis was conducted as shown.

Alternative Access - Option 2
No Access via Voigt Drive and Two Full Minor Street Access



* Access location is flexible. May be constructed along A Street, therefore providing two full access driveways along "A" Street. For analysis purposes, both driveways are assumed along "A" Street.

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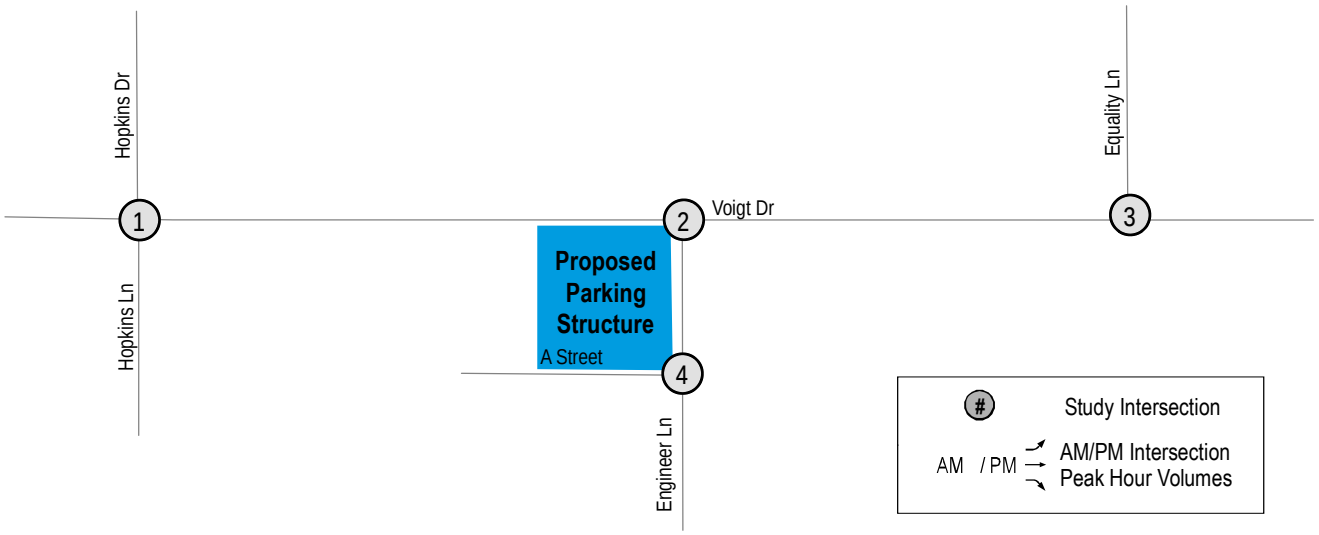
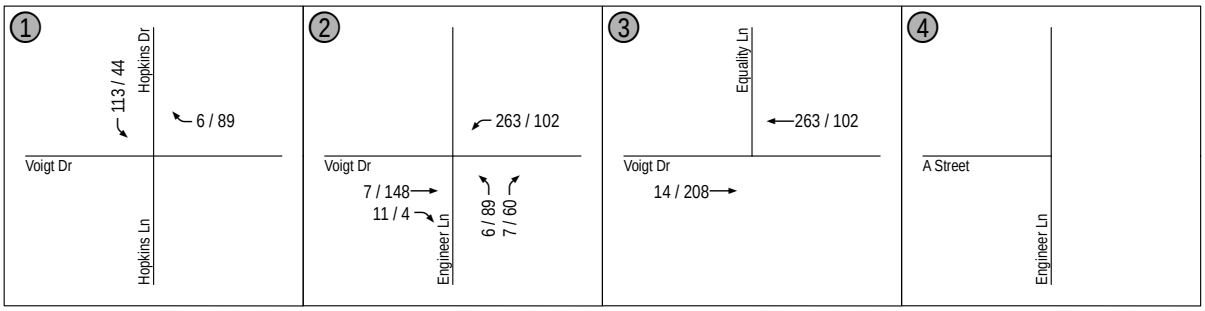
Figure 3-2

Access Options

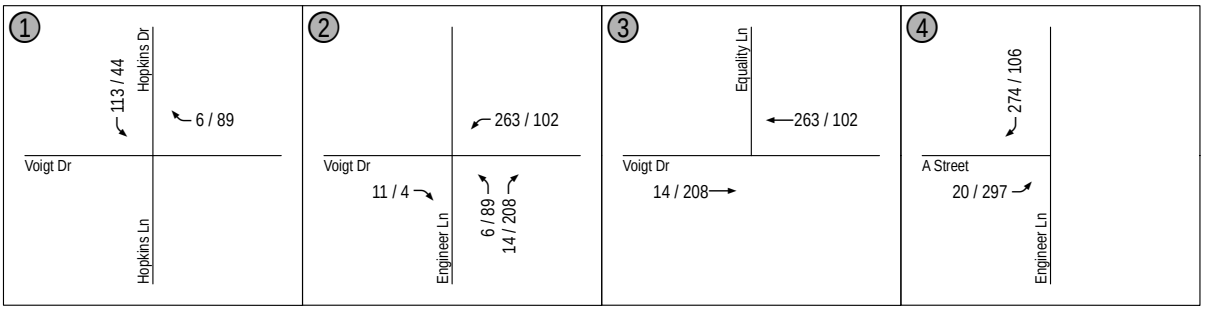
VOIGT DRIVE PARKING STRUCTURE



Project Access



Alternative Access - Option 1



Alternative Access - Option 2

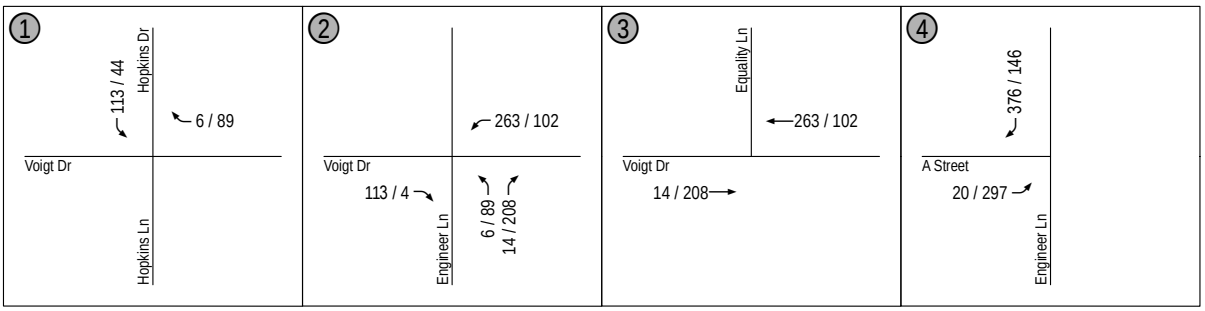


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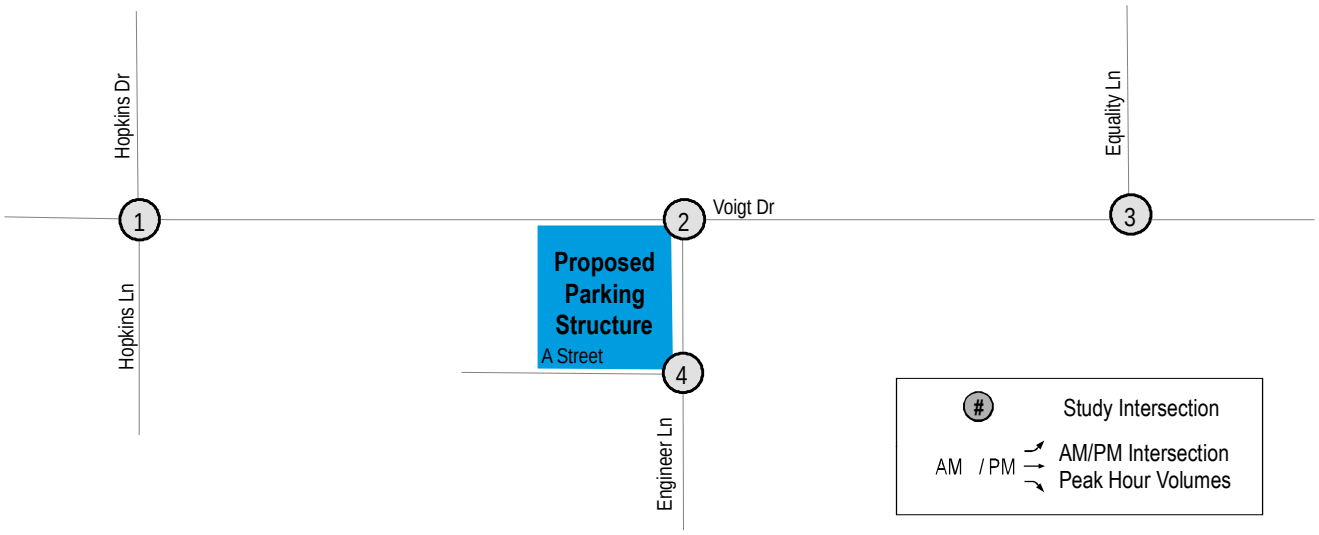
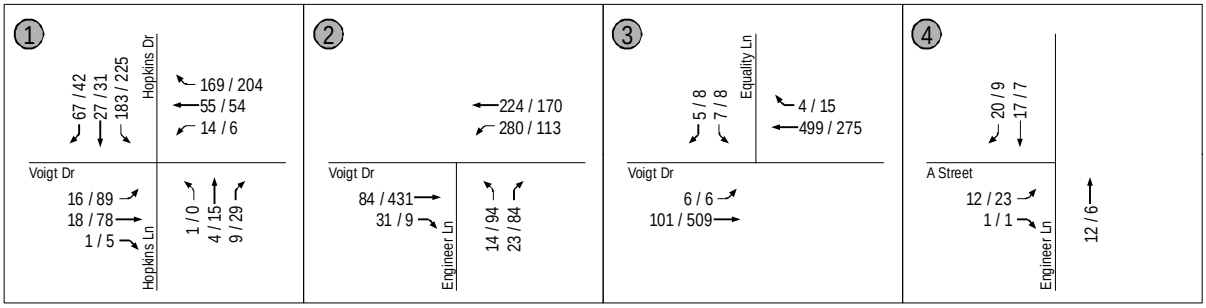
Figure 3-3

Project Traffic Volumes

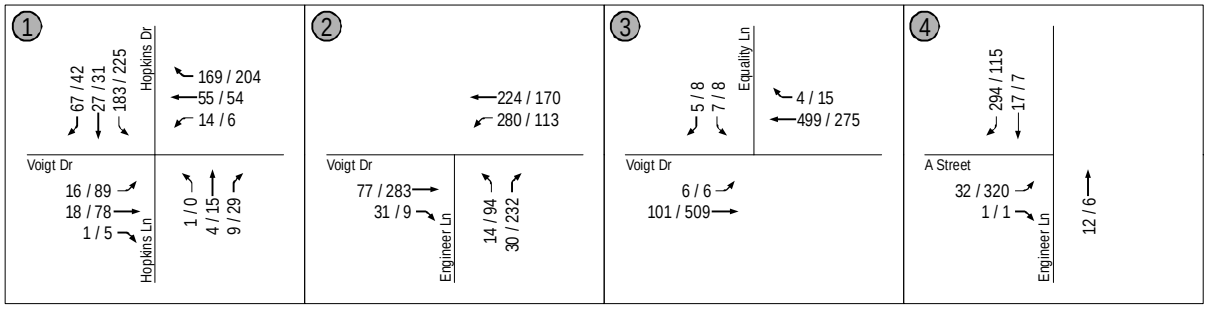
Voigt Drive Parking Structure



Project Access



Alternative Access - Option 1



Alternative Access - Option 2

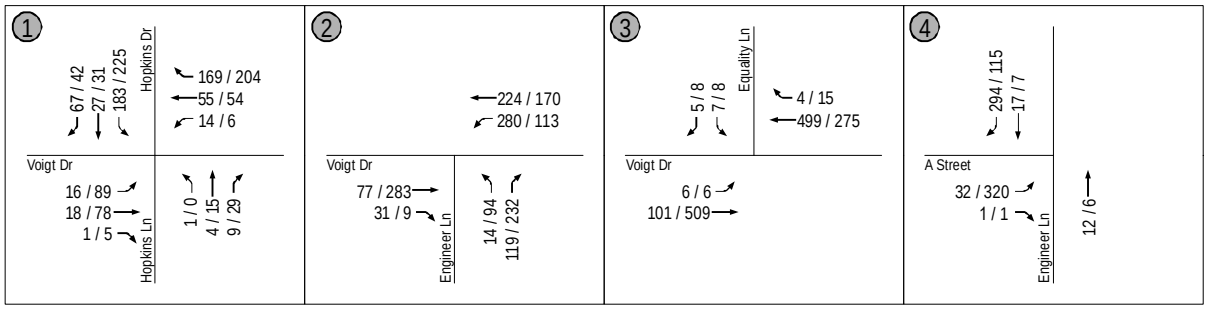


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Figure 3-4

Existing + Project Traffic Volumes

Voigt Drive Parking Structure

4.0 NEAR-TERM ANALYSIS

The following section is a discussion of the near-term analysis, which include existing, existing + project, Year 2020 and Year 2020 + Project traffic scenarios. The intersection analysis approach and methodology is contained in ***Appendix C***.

4.1 Existing

Table 4–1 summarizes the peak hour intersection operations for the existing conditions. As seen in *Table 4–1*, the subject intersections are calculated to currently operate at LOS B or better in both the AM and PM peak hours.

Appendix D contains the existing intersection analysis calculation worksheets.

4.2 Existing + Project

4.2.1 *Project Access*

Table 4–1 summarizes the intersection operations for the Project Access. As seen in *Table 4–1*, with the additional traffic attracted by the proposed parking structure, the study intersections are calculated to operate at LOS C or better during both the AM and PM peak hours.

Appendix E contains Existing + Project (w/ Project Access) intersection analysis calculation worksheets.

4.2.2 *Alternative Access Option 1*

Table 4–1 summarizes the intersection operations for Alternative Access Option 1. As seen in *Table 4–1*, with the additional traffic attracted by the proposed parking structure, the study intersections are calculated to operate at LOS C or better during both the AM and PM peak hours.

Appendix E contains Existing + Project (w/ Alternative Access Option 1) intersection analysis calculation worksheets.

4.2.3 *Alternative Access Option 2*

Table 4–1 summarizes the intersection operations for Alternative Access Option 2. As seen in *Table 4–1*, with the additional traffic attracted by the proposed parking structure, the study intersections are calculated to operate at LOS C or better during both the AM and PM peak hours.

Appendix E contains Existing + Project (w/ Alternertive Acess Option 2) intersection analysis calculation worksheets.

4.3 Year 2020

Table 4–1 summarizes the intersection operations for Year 2020. Year 2020 volumes were obtained by applying appropriate growth to the existing traffic volumes. As seen in *Table 4–1*, the subject intersections are calculated to currently operate at LOS B or better in both the AM and PM peak hours.

Appendix F contains Year 2020 intersection analysis calculation worksheets.

4.4 Year 2020 + Project

4.4.1 *Project Access*

Table 4–1 summarizes the intersection operations for the Project Access. As seen in *Table 4–1*, with the additional traffic attracted by the proposed parking structure, the study intersections are calculated to operate at LOS C or better during both the AM and PM peak hours.

Appendix G contains Year 2020 + Project (w/ Project Access) intersection analysis calculation worksheets.

4.4.2 *Alternative Access Option 1*

Table 4–1 summarizes the intersection operations for Alternative Access Option 1. As seen in *Table 4–1*, with the additional traffic attracted by the proposed parking structure, the study intersections are calculated to operate at LOS C or better during both the AM and PM peak hours.

Appendix G contains 2020 + Project (w/ Alternative Access Option 1) intersection analysis calculation worksheets.

4.4.3 *Alternative Access Option 2*

Table 4–1 summarizes the intersection operations for Alternative Access Option 2. As seen in *Table 4–1*, with the additional traffic attracted by the proposed parking structure, the study intersections are calculated to operate at LOS C or better during both the AM and PM peak hours.

Appendix G contains 2020 + Project (w/ Alternative Access Option 2) intersection analysis calculation worksheet.

TABLE 4–1
NEAR-TERM INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing		Existing + Project (Project Access)		Δ[c]	Existing + Project (Alt. Access Option 1)		Δ	Existing + Project (Alt. Access Option 2)		Δ	2020		2020 + Project (Project Access)		Δ	2020 + Project (Alt. Access Option 1)		Δ	2020 + Project (Alt. Access Option 2)		Δ
			Delay[a]	LOS[b]	Delay	LOS		Delay	LOS		Delay	LOS		Delay	LOS	Delay	LOS		Delay	LOS		Delay	LOS	
1. Voigt Dr / Hopkins Ln	AWSC	AM	9.0	A	10.0	A	1.0	10.0	A	1.0	10.0	A	1.0	9.5	A	10.3	B	0.8	10.3	B	0.8	10.3	B	0.8
		PM	11.7	B	12.8	B	1.1	12.8	B	1.1	12.8	B	1.1	12.9	B	14.1	B	1.2	14.1	B	1.2	14.1	B	1.2
2. Voigt Dr / Engineer Ln	AWSC	AM	9.4	A	13.7	B	4.3	13.8	B	4.4	13.7	B	4.3	10.0	A	14.8	B	4.8	14.7	B	4.7	15.4	C	5.4
		PM	10.9	B	16.5	C	5.6	15.1	C	4.2	16.0	C	5.1	11.8	B	19.0	C	7.2	16.5	C	4.7	17.8	C	6.0
3. Voigt Dr / Equality Ln	AWSC[d]	AM	9.6	A	12.5	B	2.9	12.5	B	2.9	12.5	B	2.9	10.1	A	13.3	B	3.2	13.3	B	3.2	13.3	B	3.2
		PM	11.0	B	16.6	C	5.6	16.6	C	5.6	16.6	C	5.6	12.1	B	19.2	C	7.1	19.2	C	7.1	19.2	C	7.1
4. Engineer Ln / A-Street	OWSC[e]	AM	8.9	A	8.9	A	0.0	10.0	B	1.1	10.5	B	1.6	9.0	A	9.0	A	0.0	10.1	B	1.1	10.6	B	1.6
		PM	9.1	A	9.1	A	0.0	14.1	B	5.0	14.8	B	5.7	9.1	A	9.1	A	0.0	14.3	B	5.2	15.1	C	6.0

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Δ denotes an increase in delay due to project.
d. All-Way Stop Control.
e. OWSC: One-Way Stop Control. Minor street left turn delay is reported.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

5.0 RECOMMENDATIONS

5.1 Transportation Improvements

Based on the evaluation provided in this report, this section is a discussion of transportation improvements for each access option that should be considered for implementation. The recommendations are independent measures that can be combined in various ways to produce different improvement options.

It is important to note that the following recommendations assume that all inbound access to the parking structure is not gated (i.e. patrons are not required to stop at the entrance to obtain a permit via a manned-ticketing booth or automated machine) and the intersection of Voigt Drive / Engineer Lane is converted into a T-intersection.

5.1.1 *Project Access*

Table 5–1 details the transportation recommendations for the Project Access that provides a right-in / right-out access driveway along Voigt Drive and a full access driveway along Engineer Lane. ***Figure 5–1*** illustrates the improvements.

5.1.2 *Alternative Access Option 1*

Table 5–2 details the transportation recommendations for Alternative Access Option 1 that provides right-in only access driveway along Voigt Drive and a full access driveway along the minor street. ***Figure 5–2*** illustrates the improvements.

5.1.3 *Alternative Access Option 2*

Table 5–3 details the transportation recommendations for Alternative Access Option 2 that provides two full access driveway along the minor street. ***Figure 5–3*** illustrates the improvements.

Based on our evaluation, the recommended improvements for all three access scenarios will work even with other major roadway improvements, such as the Voigt Drive Direct Access Ramp, Gilman Drive Bridge Connection, and the Light Rail Transit.

5.2 Parking Management Plan (PMP) Strategies

A Parking Management Plan (PMP) for the parking structure is recommended. The PMP recommendations should focus on implementing sound, cost effective demand management strategies for the proposed parking structure. ***Effective PMP strategies can increase the efficiency of the parking structure by as much as 20% - 40% and therefore should be considered for the project.*** This increased efficiency would result is requiring fewer parking stalls in the parking structure. The PMP should consider optimization of spaces, parking regulation strategies, pricing strategies, employee permit parking programs, Transportation Demand Management (TDM)/alternative transportation, pedestrian and bicycle improvements, transit opportunities, regulatory reforms, park-and-ride shuttle opportunities, peak parking strategies and cost, benefit & risk evaluation as further explained below.

- Optimization of spaces—increase the parking supply, evaluate and provide recommendations concerning parking areas, drive aisle, parking stall dimensions and

parking lot circulation. Recommend improvements to better integrate the parking supply with modes of access. Use cutting edge softwares such as ParkCADD or other similar software's to accurately and efficiently optimize the spaces and minimize footprint.

- Parking/Pedestrian Wayfinding - Analysis of time restrictions, wayfinding programs, and real-time information about parking availability should be considered. Ensuring that motorists are aware of, and can easily access parking facilities, should be an essential parking management goal.
- Parking regulation strategies—including time limits, shared parking provisions, and off-site parking allowances should be considered. Also consider policies, regulations and approaches to manage parking more efficiently. Use the spatial analysis and the parking utilization patterns to recommend shared parking between various users.
- Pricing strategies—including, but not limited to, employee parking pricing, leasing of private spaces, in-lieu fees, and variable rates and hours of operation for spaces should be considered.
- Employee Parking Permit programs—as a means to address spill-over into other areas and the long-term use of parking facilities by employees. Permit programs should be evaluated, and suggested possible changes to these programs should include boundaries of a permit district(s), hours and days of operation, pricing of permits and funding opportunities, permits per employee, and implementation processes.
- Transportation demand management strategies and improvements to alternative transportation—consider the potential for possible improvements to transit, vanpool, carpool, bicycle and pedestrian networks and programs, and carshare programs, in order to ensure that the overall plan directs investment into the most cost-effective mix of parking improvements and improvements to alternative transportation.
- Bicycle and pedestrian improvements—programs and infrastructure to increase walking or biking can significantly reduce the need to provide short-term parking. PMP should also focus on efforts to encourage drivers to make other stops by foot or bike after parking once. Use the proximity and length of stay assessment to provide better pedestrian connections, lighting, crosswalks etc. Evaluate and recommend a Program which includes pedestrian wayfinding signs to direct people to the appropriately designated parking areas.
- Park-and-Ride shuttle opportunities—to transport motorists between peripheral lots and their destinations. This will be especially valuable in preparing for special events when demand is unusually high.
- Peak period parking strategies— Recommend short-, mid-, and long-term strategies to provide parking availability during peak periods, including, but not limited to, permit pricing, enforcement strategies and technologies, and time limits. Evaluate the parking pricing structure for each lot and provide demand-responsive pricing tiers.
- Benefits, Costs and Risks - Evaluate the benefit, cost and risk for each recommendation.

TABLE 5–1
PROJECT ACCESS TRANSPORTATION IMPROVEMENTS

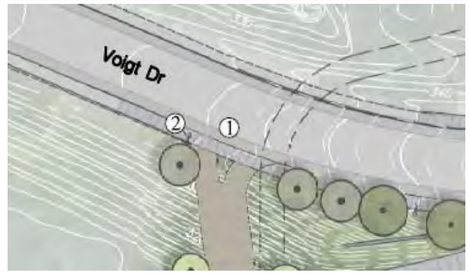
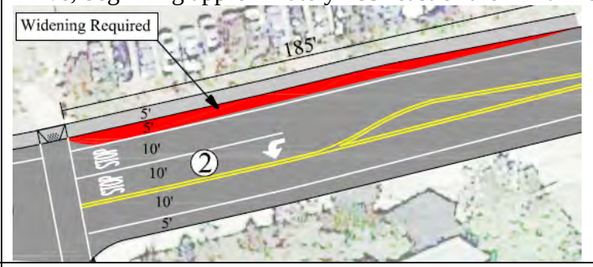
#	RECOMMENDATION	REASON	ADDITIONAL INFORMATION
1	If feasible, construct the driveway as far west from the all-way stop controlled intersection of Voigt Drive / Engineer Lane. Provide sufficient throat within the parking structure.	To provide adequate stacking length for the eastbound through/right turn movement and facilitate continuous inbound traffic into the structure.	
2	If parking structure access is gated or if there is insufficient throat into the structure, provide a dedicated right-turn-only lane prior to the access on Voigt Drive.	To reduce traffic queuing onto Voigt Drive.	
3	Provide ADA accessible curbs ramps and enhancements to the existing curb ramps (i.e. truncated domes)	To provide pedestrian accessibility to ALL pedestrians.	
4	Provide a westbound dedicated left-turn lane by widening approximately 5 feet on the north side of Voigt Drive (shown in red).	To improve intersection operations and provide stacking length for left-turning vehicles.	Approximately 5 feet of widening is required on the north side of Voigt Drive, beginning approximately 185’ east of the limit line. 
5	Provide a sidewalk on the north side of "A" Street.	To provide pedestrian connectivity along “A” Street.	

Table 5–1 (Continued)
Project Access Transportation Improvements

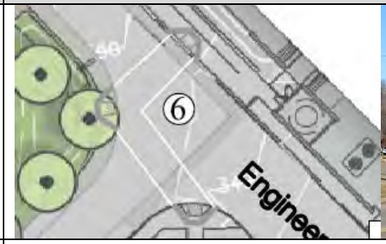
#	RECOMMENDATION	REASON	ADDITIONAL INFORMATION
6	Provide a north leg crosswalk with ADA curb ramps and rectangular rapid flashing beacons at the Engineer Lane / "A" Street intersection.	To provide a controlled crossing for pedestrians crossing Engineer Lane to/from Warren College.	 
7	Provide bicycle and pedestrian wayfinding signs.	To provide direction and information to points of interest for pedestrians and bicyclists.	 

TABLE 5–2
ALTERNATIVE ACCESS OPTION 1 TRANSPORTATION IMPROVEMENTS

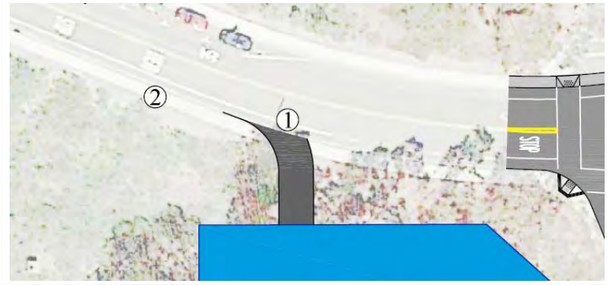
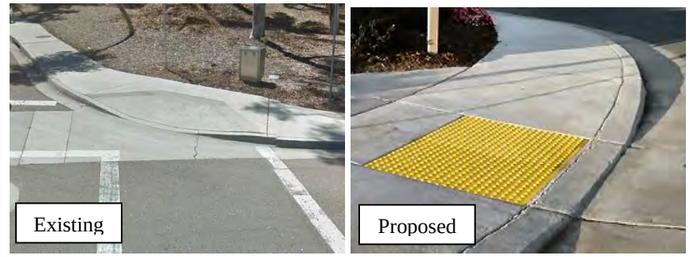
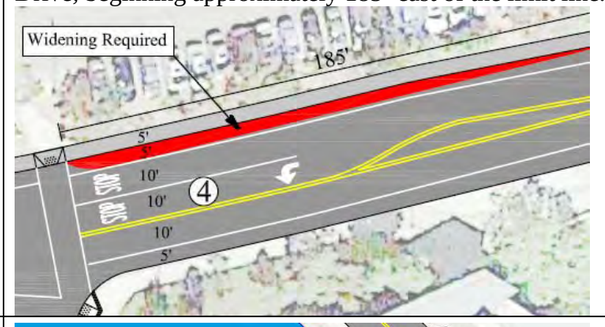
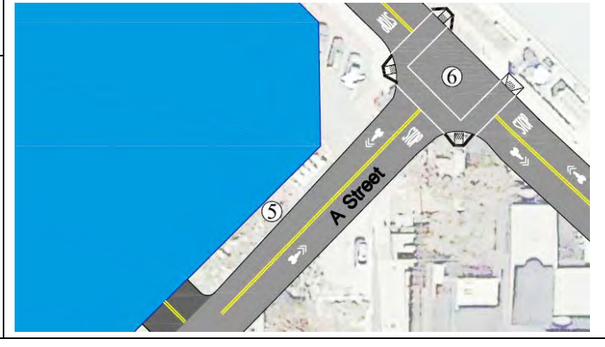
#	RECOMMENDATION	REASON	ADDITIONAL INFORMATION
1	If feasible, construct the driveway as far west from the all-way stop controlled intersection of Voigt Drive / Engineer Lane. Provide sufficient throat within the parking structure.	To provide adequate stacking length for the eastbound through/right turn movement and facilitate continuous inbound traffic into the structure.	
2	If parking structure access is gated or if there is insufficient throat into the structure, provide a dedicated right-turn-only lane prior to the access on Voight Drive.	To reduce traffic queuing onto Voigt Drive.	
3	Provide ADA accessible curb ramps and enhancements to the existing curb ramps (i.e. truncated domes etc.).	To provide pedestrian accessibility to ALL pedestrians.	
4	Provide a westbound dedicated left-turn lane at the Voigt Drive / Engineer Lane intersection.	To improve intersection operations and provide stacking length for left-turning vehicles.	Approximately 5 feet of widening is required on the north side of Voigt Drive, beginning approximately 185’ east of the limit line. 
5	Provide a sidewalk on the north side of “A” Street	To provide pedestrian connectivity along “A” Street between the parking structure and Warren Mall Walkway.	
6	Provide all-way stop control at the Engineer Lane / “A” Street intersection with marked crosswalks and ADA accessible curb ramps.	To provide a controlled crossing pedestrians/bicyclists crossing Engineer Lane to/from Warren College.	

Table 5–2 (Continued)
Alternative Access Option 1 Transportation Improvements

#	RECOMMENDATION	REASON	ADDITIONAL INFORMATION
7	If a bicycle pathway is not provided via the roof of the proposed parking structure, provide shared lane markings (also known as Sharrows) along Engineer Lane and “A” Street.	To provide bicycle connectivity between Voigt Drive (existing bike lanes) and Warren Mall Walkway.	
8	Provide bicycle and pedestrian wayfinding signs.	To provide direction and information to points of interest for pedestrians and bicyclists.	 

TABLE 5–3
ALTERNATIVE ACCESS OPTION 2 TRANSPORTATION IMPROVEMENTS

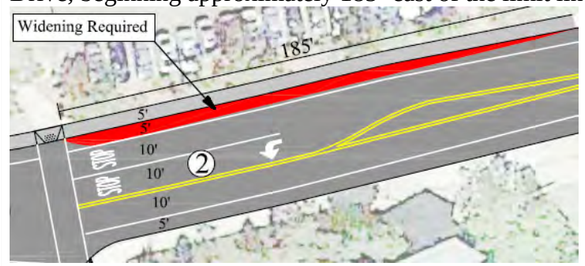
#	RECOMMENDATION	REASON	ADDITIONAL INFORMATION
1	Provide ADA accessible curb ramps and enhancements to the existing curb ramps (i.e. truncated domes).	To provide pedestrian accessibility to ALL pedestrians.	
2	Provide a westbound dedicated left-turn lane at the Voigt Drive / Engineer Lane intersection.	To improve intersection operations and provide stacking length for left-turning vehicles.	Approximately 5 feet of widening is required on the north side of Voigt Drive, beginning approximately 185' east of the limit line. 
3	Provide a sidewalk on the north side of "A" Street	To provide pedestrian connectivity along "A" Street between the parking structure and Warren Mall Walkway.	
4	Provide a north leg crosswalk with ADA curb ramps and rectangular rapid flashing beacons at the Engineer Lane / "A" Street intersection.	To provide a controlled crossing for pedestrians crossing Engineer Lane to/from Warren College.	 

Table 5–3 (Continued)
Alternative Access Option 2 Transportation Improvements

#	RECOMMENDATION	REASON	ADDITIONAL INFORMATION
5	If a bicycle pathway is not provided via the roof of the proposed parking structure, provide shared lane markings (also known as Sharrows) along Engineer Lane and “A” Street.	To provide bicycle connectivity between Voigt Drive (existing bike lanes) and Warren Mall Walkway.	
6	Provide bicycle and pedestrian wayfinding signs.	To provide direction and information to points of interest for pedestrians and bicyclists.	 

Voigt Dr

Engineer Ln

"A" Street

See Inset A

Project Access Features

Ⓐ Right-in / Right-out driveway along Voigt Drive.

Ⓑ Full access driveway along Engineer Lane.

Recommended Improvements

① If feasible, construct the driveway as far west from the all-way stop controlled intersection of Voigt Drive / Engineer Lane. Provide sufficient throat within the parking structure.

② If parking structure access is gated or if there is insufficient throat into the structure, provide a dedicated right-turn-only lane prior to the access on Voigt Drive.

③ Provide ADA acessible curbs ramps and enhancements to the existing curb ramps (i.e. truncated domes)

④ Provide a westbound dedicated left-turn lane by widening approximately 5 feet on the north side of Voigt Drive (shown in red).

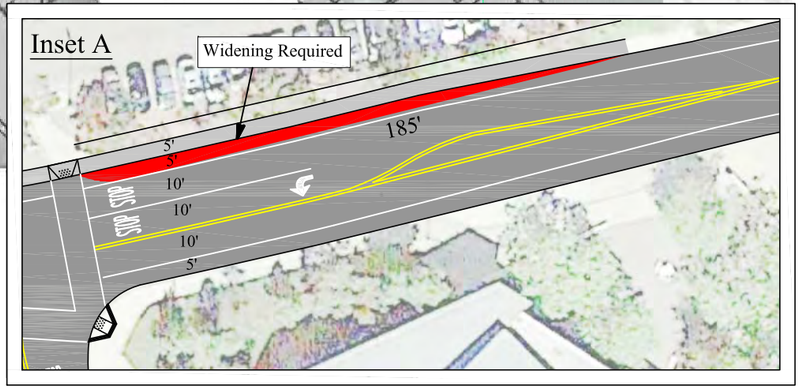
⑤ Provide a sidewalk on the north side of "A" Street.

⑥ Provide a north leg crosswalk with ADA curb ramps and rectangular rapid flashing beacons at the Engineer Lane / "A" Street intersection.

General Recommendations

⑦ Provide bicycle and pedestrian wayfinding signs.

Inset A



NORTH

1" : 50'

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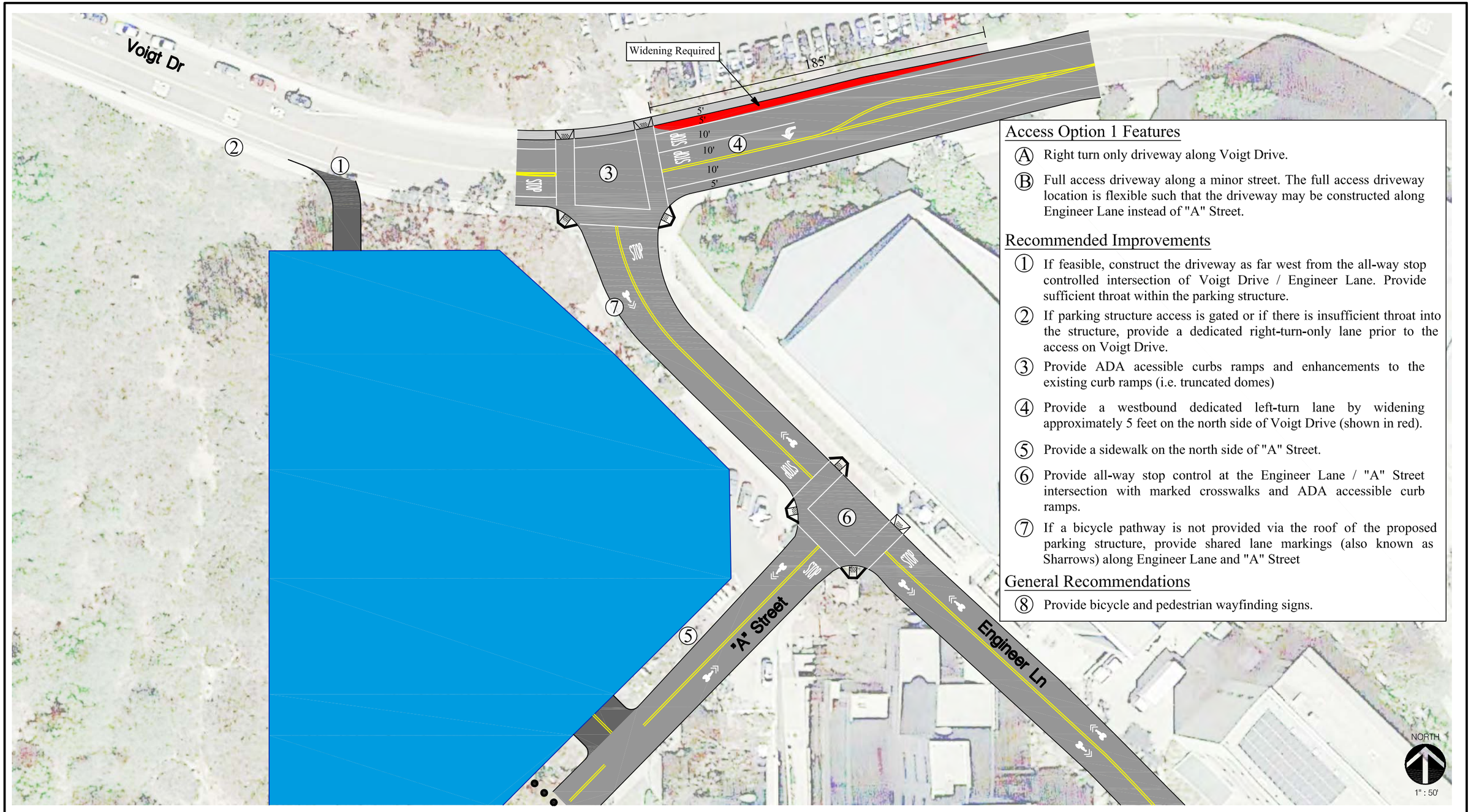
LINSCOTT LAW & GREENSPAN engineers

Figure 5-1

Project Access - Recommended Improvements

VOIGT DRIVE PARKING STRUCTURE



Access Option 1 Features

Ⓐ Right turn only driveway along Voigt Drive.

Ⓑ Full access driveway along a minor street. The full access driveway location is flexible such that the driveway may be constructed along Engineer Lane instead of "A" Street.

Recommended Improvements

① If feasible, construct the driveway as far west from the all-way stop controlled intersection of Voigt Drive / Engineer Lane. Provide sufficient throat within the parking structure.

② If parking structure access is gated or if there is insufficient throat into the structure, provide a dedicated right-turn-only lane prior to the access on Voigt Drive.

③ Provide ADA acessible curbs ramps and enhancements to the existing curb ramps (i.e. truncated domes)

④ Provide a westbound dedicated left-turn lane by widening approximately 5 feet on the north side of Voigt Drive (shown in red).

⑤ Provide a sidewalk on the north side of "A" Street.

⑥ Provide all-way stop control at the Engineer Lane / "A" Street intersection with marked crosswalks and ADA accessible curb ramps.

⑦ If a bicycle pathway is not provided via the roof of the proposed parking structure, provide shared lane markings (also known as Sharrows) along Engineer Lane and "A" Street

General Recommendations

⑧ Provide bicycle and pedestrian wayfinding signs.

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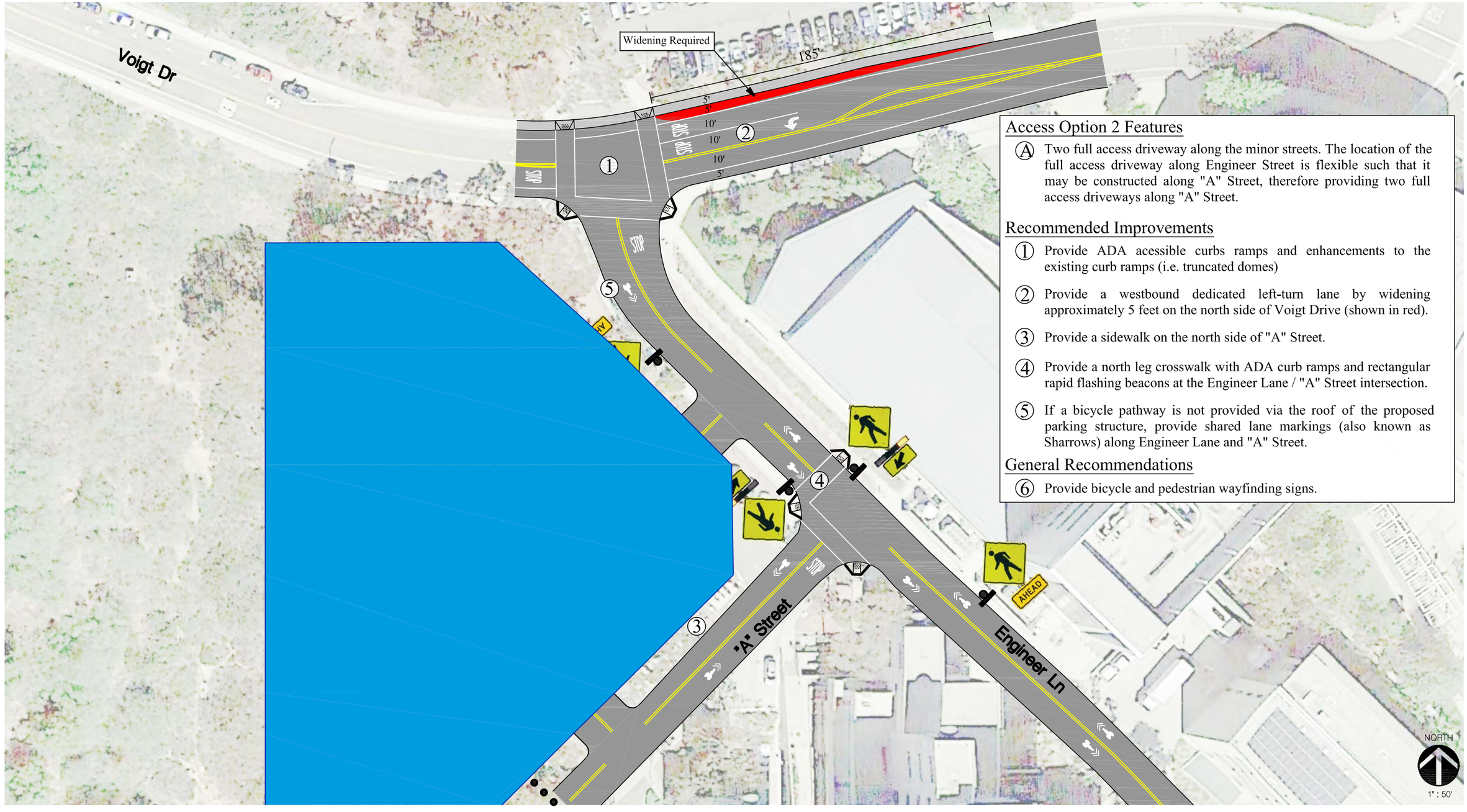
Figure 5-2

Alternative Access Option 1 : Recommended Improvements

VOIGT DRIVE PARKING STRUCTURE



Access Option 2 Features

Ⓐ Two full access driveway along the minor streets. The location of the full access driveway along Engineer Street is flexible such that it may be constructed along "A" Street, therefore providing two full access driveways along "A" Street.

Recommended Improvements

① Provide ADA acessible curbs ramps and enhancements to the existing curb ramps (i.e. truncated domes)

② Provide a westbound dedicated left-turn lane by widening approximately 5 feet on the north side of Voigt Drive (shown in red).

③ Provide a sidewalk on the north side of "A" Street.

④ Provide a north leg crosswalk with ADA curb ramps and rectangular rapid flashing beacons at the Engineer Lane / "A" Street intersection.

⑤ If a bicycle pathway is not provided via the roof of the proposed parking structure, provide shared lane markings (also known as Sharrows) along Engineer Lane and "A" Street.

General Recommendations

⑥ Provide bicycle and pedestrian wayfinding signs.

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REV. 7/12/2017
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Figure 5-3

Alternative Access Option 2 : Recommended Improvements

VOIGT DRIVE PARKING STRUCTURE

LINSCOTT LAW & GREENSPAN engineers

TECHNICAL APPENDICES
VOIGT DRIVE PARKING STRUCTURE
La Jolla, California

LLG Ref. 3-16-2681

Linscott, Law & Greenspan, Engineers
4542 Ruffner Street
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San Diego, CA 92111
858.300.8800 T
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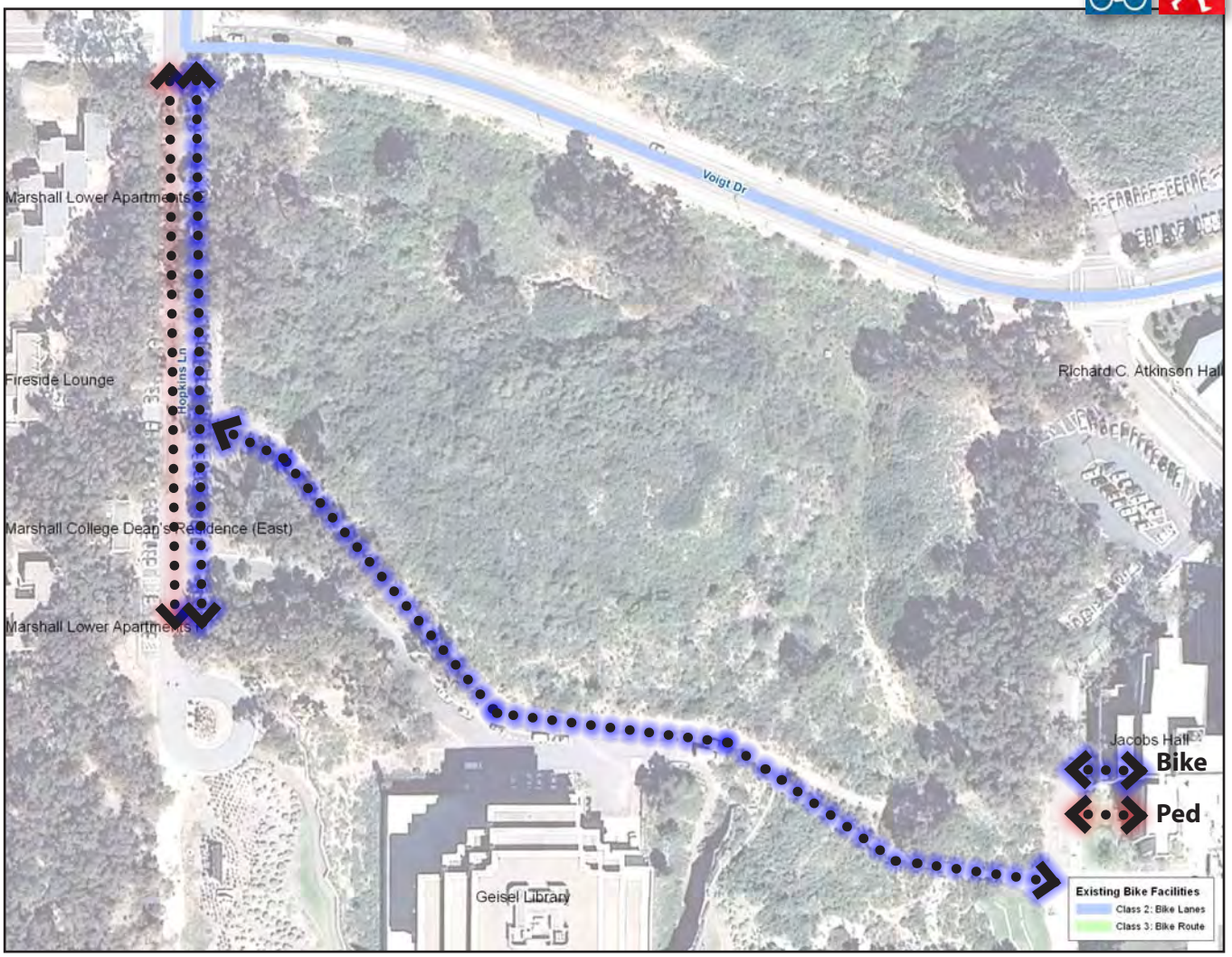
www.llgengineers.com

APPENDIX A

BICYCLE & PEDESTRIAN MASTER PLANNING STUDY EXCERPT

1A. Hopkins Lane Walkway Improvements

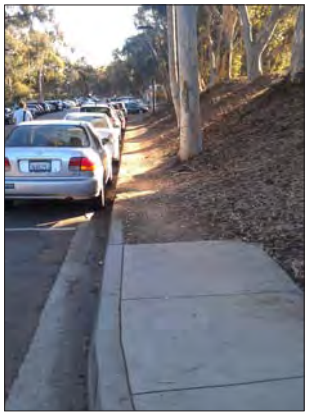


Problem:

- Missing sidewalk on west side of Hopkins Lane.
- West leg stop bars too far into Voigt Drive/Hopkins lane intersection.

Proposed Improvement:

- Change parking configuration to parallel parking and add sidewalks and sharrows and move stop bars back an appropriate distance. *(This route would provide a direct route to the library from Voigt Drive via Hopkins Lane.)*



1B. Library Walk Bicycle Bypass (north of Library)

Problem:

- Need alternate bicycle routes around Library Walk.

Proposed Improvement:

- Investigate connection between Hopkins Lane and Warren College as a formalized multi-modal connection. Would require lighting and paving upgrades. *(May require removal of parking spaces on Hopkins Lane to make entrance more visible.)*

Background

Hopkins Lane and the pathway north of the Geisel Library connect large amounts of student housing in Eleanor Roosevelt College and North Campus to the academic buildings in Warren College. Hopkins Lane is also the primary pathway to the central campus from the Hopkins Parking Structure. Just south of the Geisel Library, Library Walk is a bicycle dismount zone. Both facilities are used by cyclists, pedestrians and electric carts. Hopkins Lane is also used by vehicles. The proposed improvements would improve Hopkins Lane for cyclists and pedestrians, as well as improve the pathway north of the Geisel Library to alleviate congestion on Library Walk.

This project is one of the BPMPS Top 5 priority projects. In BPMPS community workshops and online surveys, the campus community indicated Hopkins Lane and the pathway north of the Geisel Library as an area for improvement, especially to alleviate congestion on Library Walk.

Description of Need

Library Walk is one of the campus' foremost activity centers. It is an open space, a transportation corridor and an event programming space. It is typically packed with students between classes. Because of its high use levels, Library Walk is a bicycle dismount zone to reduce the possibility of cyclist versus pedestrian conflicts.

No suitable and direct facilities for cyclists or pedestrians exist between Eleanor Roosevelt College, North Campus and Warren College. Voigt Drive is a relatively direct connection with bike lanes and sidewalks, but it is not well-used by cyclists or pedestrians because of its somewhat indirect path, higher traffic speeds and steep grades.

In its existing condition, Hopkins Lane has narrow sidewalks on its east side only. It has a combination of student parallel parking and 90 degree parking on both sides. Street lighting is intermittent. There is a book drop-off loop frequently used by drivers to drop-off books or passengers. Pedestrians often walk in the middle of the street. Due the high rate of parking turnover and traffic volumes, the roadway configuration is currently not suitable for cyclist or pedestrian transportation.

The pathway north of the library has a varying width of approximately six to eight feet. Pavement quality is generally poor and adjacent landscaping encroaches on the path. Pathway lighting is intermittent.

Project Description

Improving Hopkins Lane and the pathway north of the Geisel Library would give students traveling by bicycle between Eleanor Roosevelt College, North Campus and Warren College a high-quality facility that bypasses Library Walk. To make path access more visible, two parking spaces should be removed where it intersects with Hopkins Lane and lighting should be increased at the path entrance.

The proposed project would add sidewalks along Hopkins Lane to encourage pedestrians away from walking in the street. It would add sharrows on Hopkins Lane to indicate a shared lane for bicycles and vehicles and to encourage proper cyclist positioning. The proposed project would also improve the pathway north of the Geisel Library by widening it to eight to 10 feet, replacing the worn asphalt and improving the connection to the Snake Path and Warren College. Lighting would be added along Hopkins Lane and the pathway north of the Library, where a two foot decomposed granite sidepath would be added adjacent to the eight feet of asphalt paving. This sidepath would be compacted and polymer-stabilized to prevent loose material from drifting onto the asphalt portion.

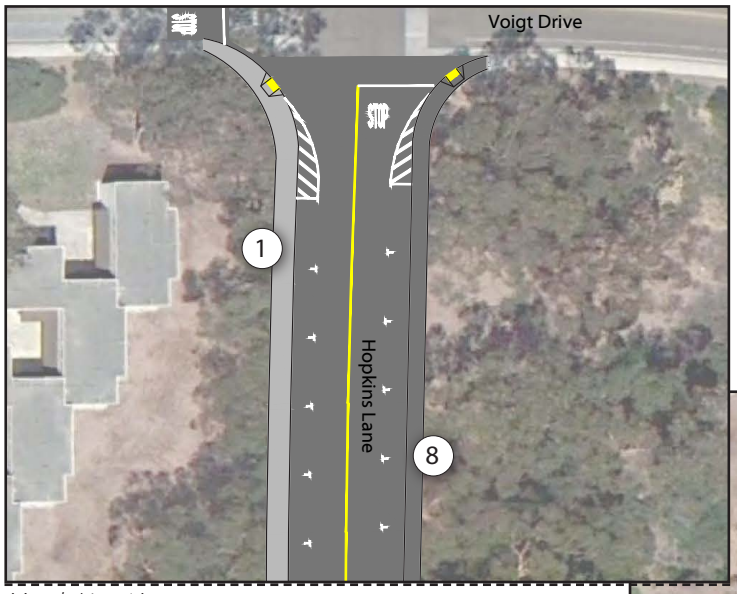
Cost Estimate

$282,350

Candidate Funding Sources

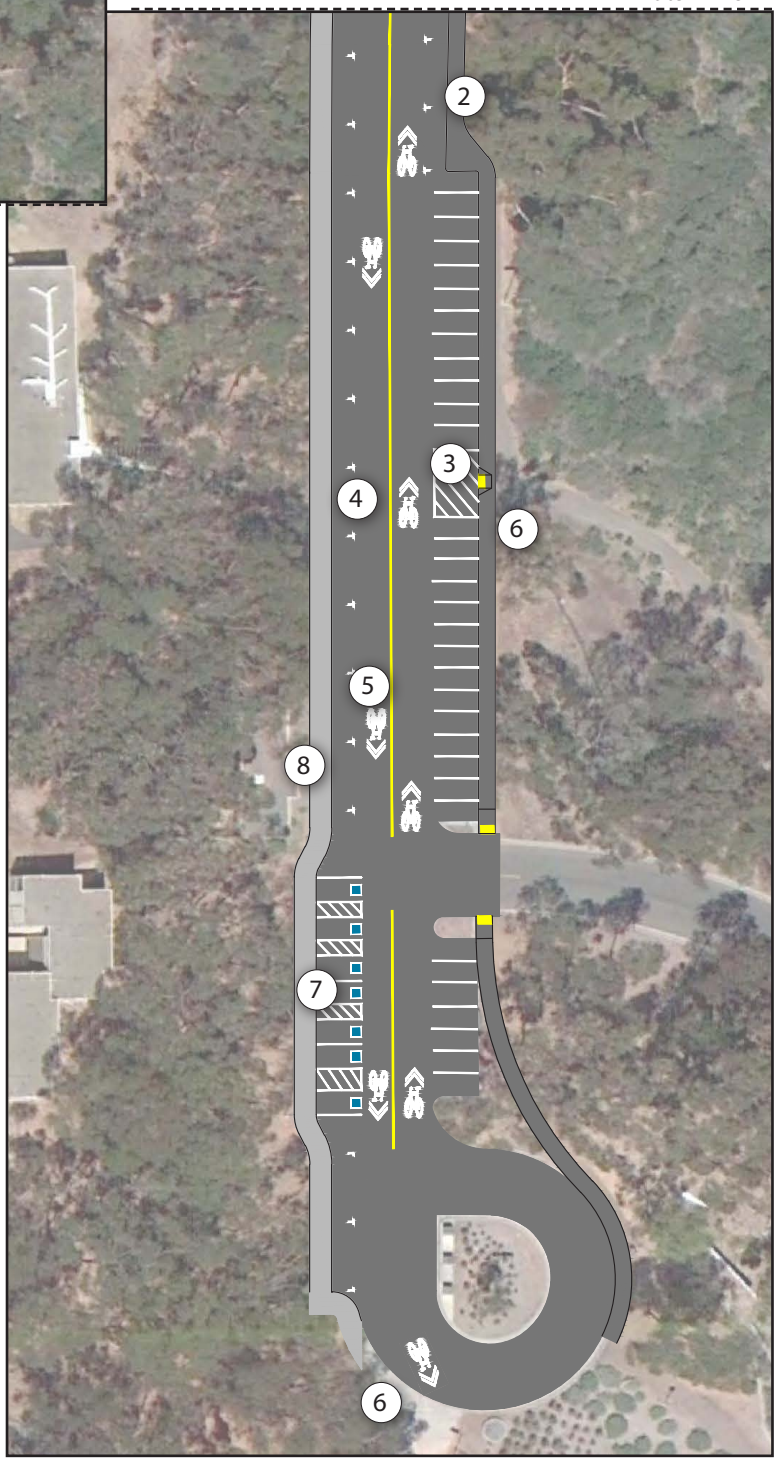
- UC San Diego infrastructure project

1A. Hopkins Lane Walkway Improvements



Match Line 1A

Match Line 1A



Legend

1. *Add eight foot sidewalk and retaining wall.*
2. *Replace existing asphalt sidewalk with new asphalt sidewalk.*
3. *Remove two parking spaces to improve bicycle path visibility.*
4. *Convert existing 90º parking to parallel parking and add sidewalk.*
5. *Add shared lane markings (Sharrows).*
6. *Add wayfinding signage.*
7. *Retain existing disabled parking spaces and book drop.*
8. *Provide lighting to campus standards.*

1B. Library Walk Bicycle Bypass (north of Library)

Match Line 1B

Shared lane markings (Sharrows) indicate a shared lane for cyclists and vehicles and recommended cyclist positioning within the roadway.

Wide walkways allow pedestrians to comfortably walk side-by-side and encourage walking on them instead of in the street.

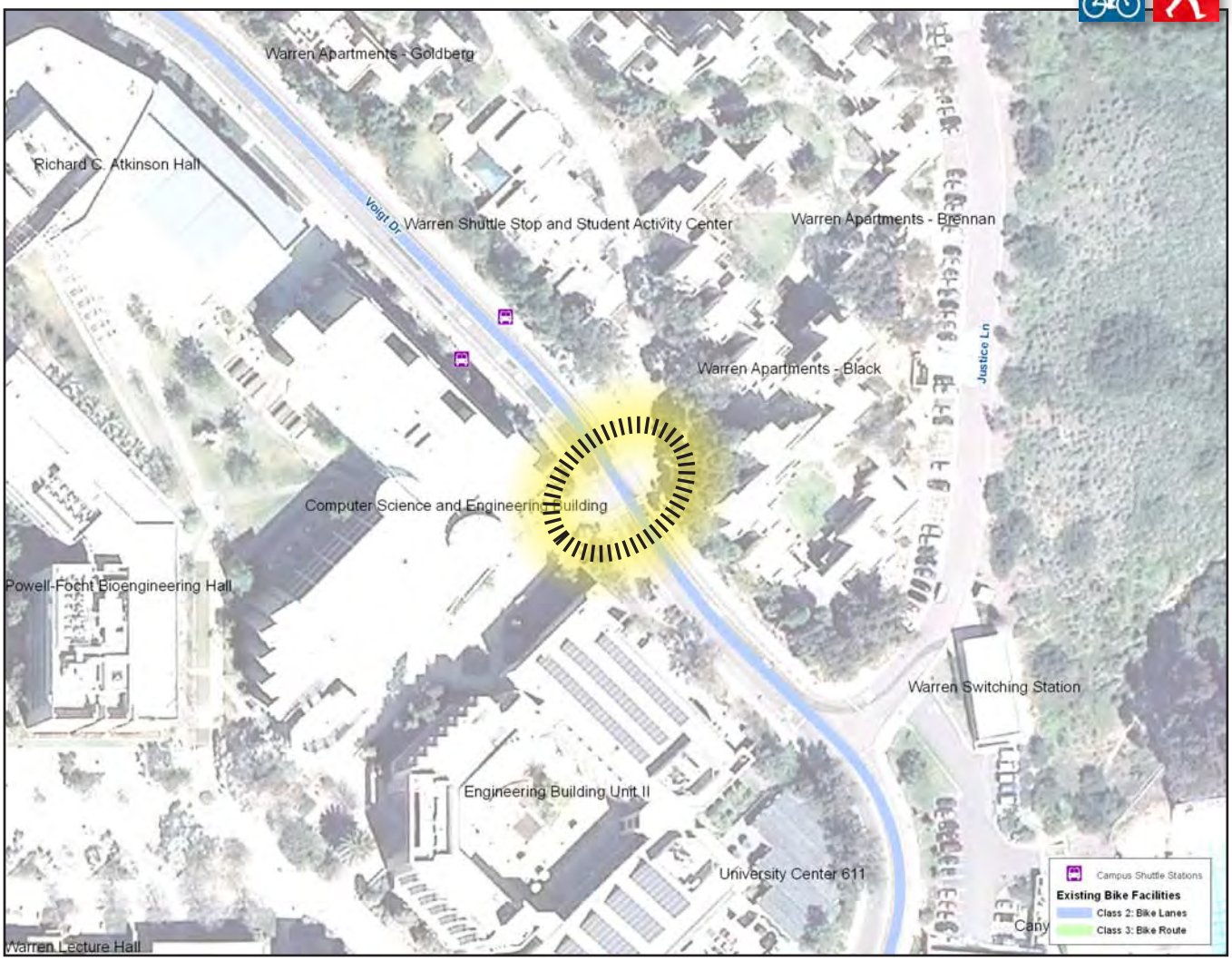
Tuncated domes alert the sight-impaired to roadway crossings. Typically yellow to contrast with concrete walkways, thyey can be other colors as long as they provide sufficient contrast with the surface.

New light fixtures should match the existing black "shoebox" style found throughout the area.

No new pavement will be added adjacent to the Snake Path. Instead, vegetation should be trimmed back and native soil and mulch added along the sides.

The path will be asphalt with polymer-stabilized decomposed granite on one side.

2. Warren College/Voigt Drive Pedestrian and Bicycle Crossing



Problems:

- Crossing conflict. *(May need to "calm" bicycle, skateboard and pedestrian traffic. Some drivers do not yield to crossing cyclists, skateboarders and pedestrians. Likewise, many cyclists, skaters and pedestrians cross without hesitation or regard for right-of-way.)*
- Constant flow of traffic in all directions from all uses.
- Poor crosswalk visibility to approaching eastbound drivers on Voigt Drive due to vertical curvature.

Proposed Improvements:

- Add truncated domes *(resolves one problem only)*.
- Remove existing speed table and replace with California MUTCD-compliant design. *(US Traffic Calming Guide includes suggested best practices for bicycle-compatible speed tables.)*
- Existing signage at crossing not standard nor consistent with California MUTCD and California Vehicle Code. *(California law requires drivers to yield (not stop) for pedestrians within crosswalks.*
- Install functional chicanes where pedestrians and cyclists approach street to induce them to slow before crossing. *(Such diversions need to be highly visible and allow for emergency vehicle access.)*
- Consider stop sign or signal if pedestrian volumes meet California MUTCD warrant.

Background

The Voigt Drive crossing in Warren College is heavily used by students since it connects large quantities of student housing north of Voigt Drive with academic buildings south of Voigt Drive. The purpose of the proposed project is to improve safety for pedestrians, cyclists and other users.

The project is one of the BPMPS Top 5 priority projects. In BPMPS community workshops and on-line surveys, this crossing was noted as a location for improvement. Collisions occurred here during the course of the study.

Description of Need

The Warren College Apartments and the Warren College Residence Halls provide housing for a significant portion of the UC San Diego campus population north of Voigt Drive. South of Voigt Drive, highly-used academic buildings within Warren College include Warren Lecture Hall and the engineering buildings. Anyone who walks between the residential and academic buildings in Warren College must use this crossing.

The existing crossing features a raised crosswalk with signage for both drivers and cyclists/pedestrians, full-time flashing beacons in advance of the crosswalk and several clusters of "Bott's dots." Voigt Drive has two vehicle lanes and carries hundreds of vehicles per hour. The speed limit on Voigt Drive is not well-defined. Westbound, there are signs that clearly indicate the speed limit is 25 miles per hour. However, the nearest eastbound speed limit sign is over 1,000 feet away and indicates that the speed limit is 35 miles per hour. Closer to the crosswalk, there are "25" stencils on the roadway. Because of existing vertical and horizontal curvature, eastbound sight distance is limited to approximately 160 feet. Downhill pathways leading to the crosswalk often result in cyclists, skateboarders and other wheeled users crossing Voigt Drive at unsafe speeds.

UC San Diego staff and participants in the community workshops indicated that the existing speed table is not performing well because of its gentle slope and height. They noted incidences of close calls and at least one recent collision. Pedestrians and cyclists at the crosswalk are often inattentive. Yield compliance by drivers is moderate.

Crosswalk improvements would provide students, faculty and staff with a safe crossing between the residential and academic buildings.

Project Description

Two options are proposed for the crossing across Voigt Drive at Warren College:

Option A would remove the existing raised crosswalk and replace it with high-visibility crosswalk striping and curb ramps. It would add California MUTCD-compliant signage including "State Law: Yield to Pedestrians Within Crosswalk." Within the pathway south of the crosswalk, sections of paving would be replaced with cobbles mortared in place to create a chicane effect to slow downhill cyclists and skateboarders as they approach the crossing.

West of the crosswalk, speed humps would be added to Voigt Drive to slow eastbound vehicles. The proposed speed humps are designed to produce acceptable vehicle speeds for the available eastbound sight distance. As an optional enhancement, Rapid Rectangular Flashing Beacons (RRFBs) with remote detection are recommended.

Option B would remove the existing raised crosswalk and replace it with high-visibility crosswalk striping, curb ramps and a traffic signal with pedestrian-friendly timing. California MUTCD-compliant signage would be provided to alert drivers of the traffic signal. On the pathway south of the crosswalk, sections of paving would be replaced with mortared cobbles to provide a chicane effect to slow downhill cyclists and skateboarders.

Option A could be implemented in the near-term to address existing need. Given the anticipated increase in traffic volume associated with the Voigt Drive Direct Access Ramp (DAR), Option B should be implemented with the Caltrans North Coast Project.

Cost Estimate

Option A: $26,770 ($74,770 with optional RRFB installation)

Option B: $196,480

Candidate Funding Sources

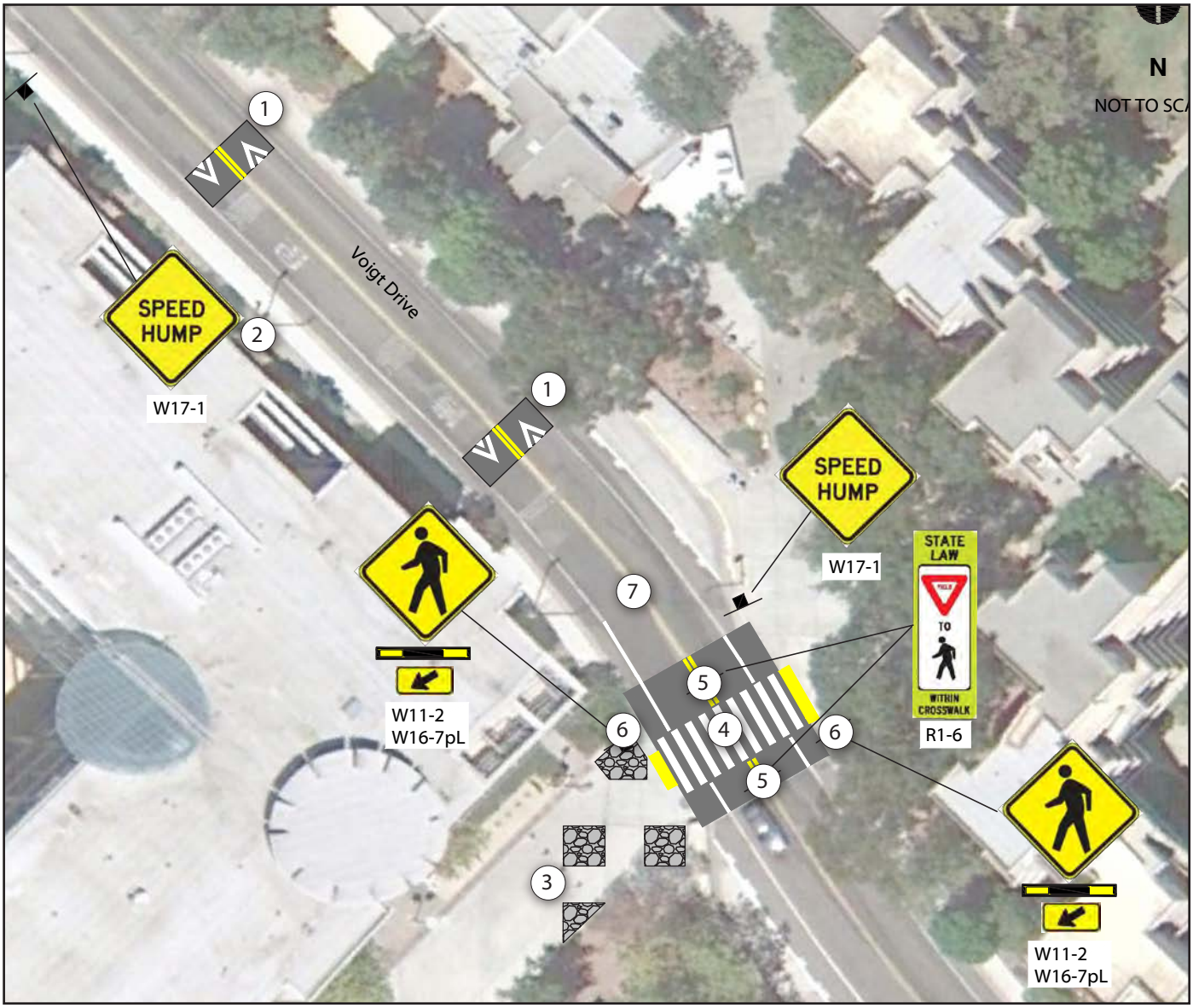
Option A:

- UC San Diego infrastructure project
- Highway Safety Improvement Program (HSIP)

Option B:

- Caltrans North Coast Project

2. Warren College/Voigt Drive Pedestrian and Bicycle Crossing - Option A



Legend 2 - Option A (Yield-controlled Crossing)

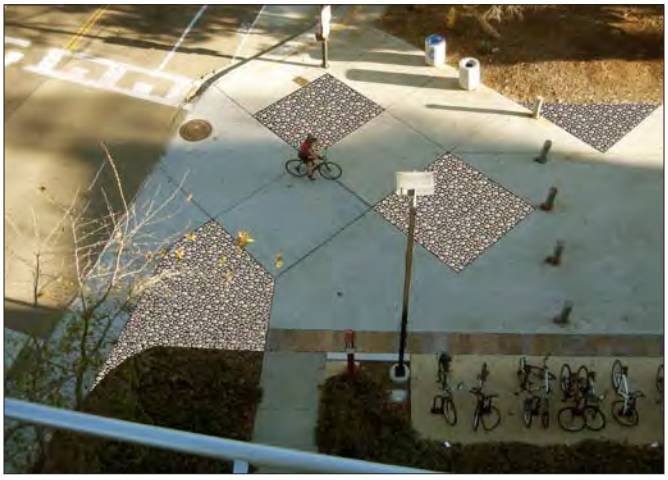
1. *Add 14 foot long, four inch high sinusoidal speed humps.*
2. *Remove existing flashing beacon.*
3. *Add chicanes to reduce approach speeds. Employ fixed-in-place cobble to maintain emergency access.*
4. *Replace existing raised crosswalk with at-grade crosswalk and high-visibility striping.*
5. *Add MUTCD-compliant crosswalk signage.*
6. *Optional: Install Rapid Rectangular Flashing Beacons (RRFBs) with remote detection.*
7. *Provide lighting to campus standards.*

2. Warren College/Voigt Drive Pedestrian and Bicycle Crossing - Option B

Legend 2 - Option B (Signalized Crossing)

1. *Remove existing flashing beacon.*
2. *Add chicanes to reduce approach speeds. Employ fixed-in-place cobble to maintain emergency access.*
3. *Replace existing raised crosswalk with at-grade crosswalk and high-visibility striping.*
4. *Add truncated domes.*
5. *Add traffic signal with pedestrian-friendly phasing/timing*
6. *Provide lighting to campus standards.*

The traffic signal should have vehicle and pedestrian-controlling indicators and should be timed to prioritize pedestrian travel during class change periods.



The chicane is intended to coordinate with the existing paving scoreline pattern. Specific concrete sections would be replaced with fixed-in-place cobble.

Cobble should be large enough to discourage riding across them by cyclists and skateboarders, but small enough to allow continued access for emergency vehicles.

APPENDIX B

TRAFFIC COUNT SHEETS

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

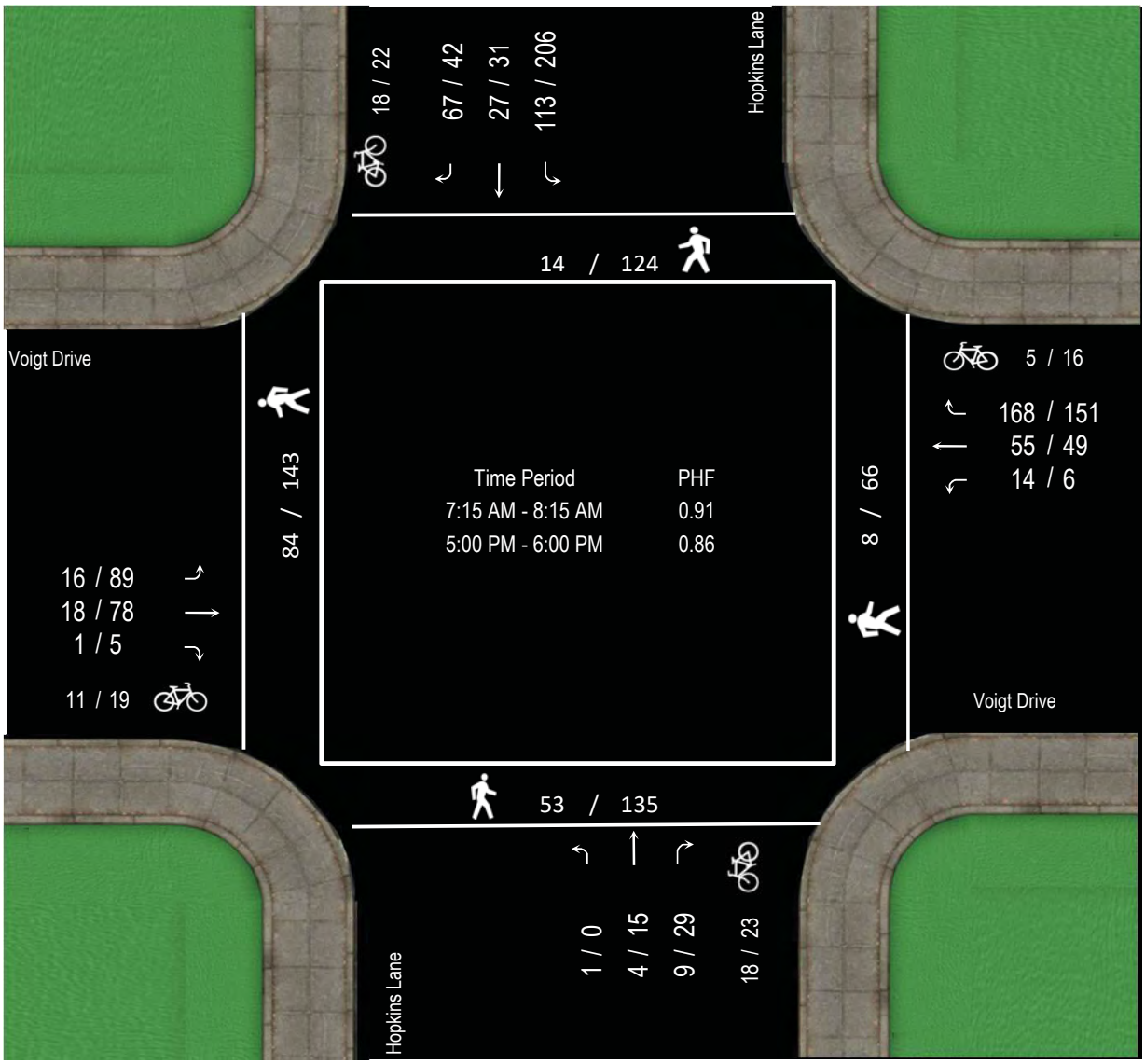
Location: Voigt Drive @ Hopkins Lane

Date of Count: *Thursday, October 27, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0580*



LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

AVC

Location: Voigt Drive @ Hopkins Lane

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	16	1	19	37	5	0	1	0	0	0	2	3	84
7:15 AM	11	5	23	71	13	5	1	0	1	0	1	4	135
7:30 AM	16	8	26	40	11	1	1	0	0	1	4	2	110
7:45 AM	19	6	37	28	15	1	2	0	0	0	10	5	123
8:00 AM	21	8	27	29	16	7	5	4	0	0	3	5	125
8:15 AM	21	5	27	23	16	0	0	6	1	2	2	5	108
8:30 AM	17	5	27	28	17	2	2	3	0	1	4	3	109
8:45 AM	21	7	24	28	25	4	0	4	1	1	2	0	117
Total	142	45	210	284	118	20	12	17	3	5	28	27	911

AM Intersection Peak Hour : **7:15 AM - 8:15 AM** Intersection PHF : **0.91**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	67	27	113	168	55	14	9	4	1	1	18	16	493
PHF	0.80	0.84	0.76	0.59	0.86	0.50	0.45	0.25	0.25	0.25	0.45	0.80	0.91
Movement PHF		0.83			0.67			0.39			0.58		0.91

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	6	5	24	32	6	5	5	6	0	0	18	18	125
4:15 PM	7	2	40	26	10	2	3	6	0	1	22	10	129
4:30 PM	5	5	46	39	12	6	3	7	2	2	16	18	161
4:45 PM	6	7	18	25	13	1	3	5	0	0	20	19	117
5:00 PM	4	9	58	45	16	2	11	5	0	0	24	29	203
5:15 PM	9	10	58	41	11	0	6	3	0	1	19	10	168
5:30 PM	10	11	47	37	10	2	6	5	0	2	23	26	179
5:45 PM	19	1	43	28	12	2	6	2	0	2	12	24	151
Total	66	50	334	273	90	20	43	39	2	8	154	154	1,233

PM Intersection Peak Hour : **5:00 PM - 6:00 PM** Intersection PHF : **0.86**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	42	31	206	151	49	6	29	15	0	5	78	89	701
PHF	0.55	0.705	0.888	0.839	0.766	0.75	0.659	0.75	#####	0.625	0.813	0.767	0.86
Movement PHF		0.91			0.82			0.69			0.81		0.86

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

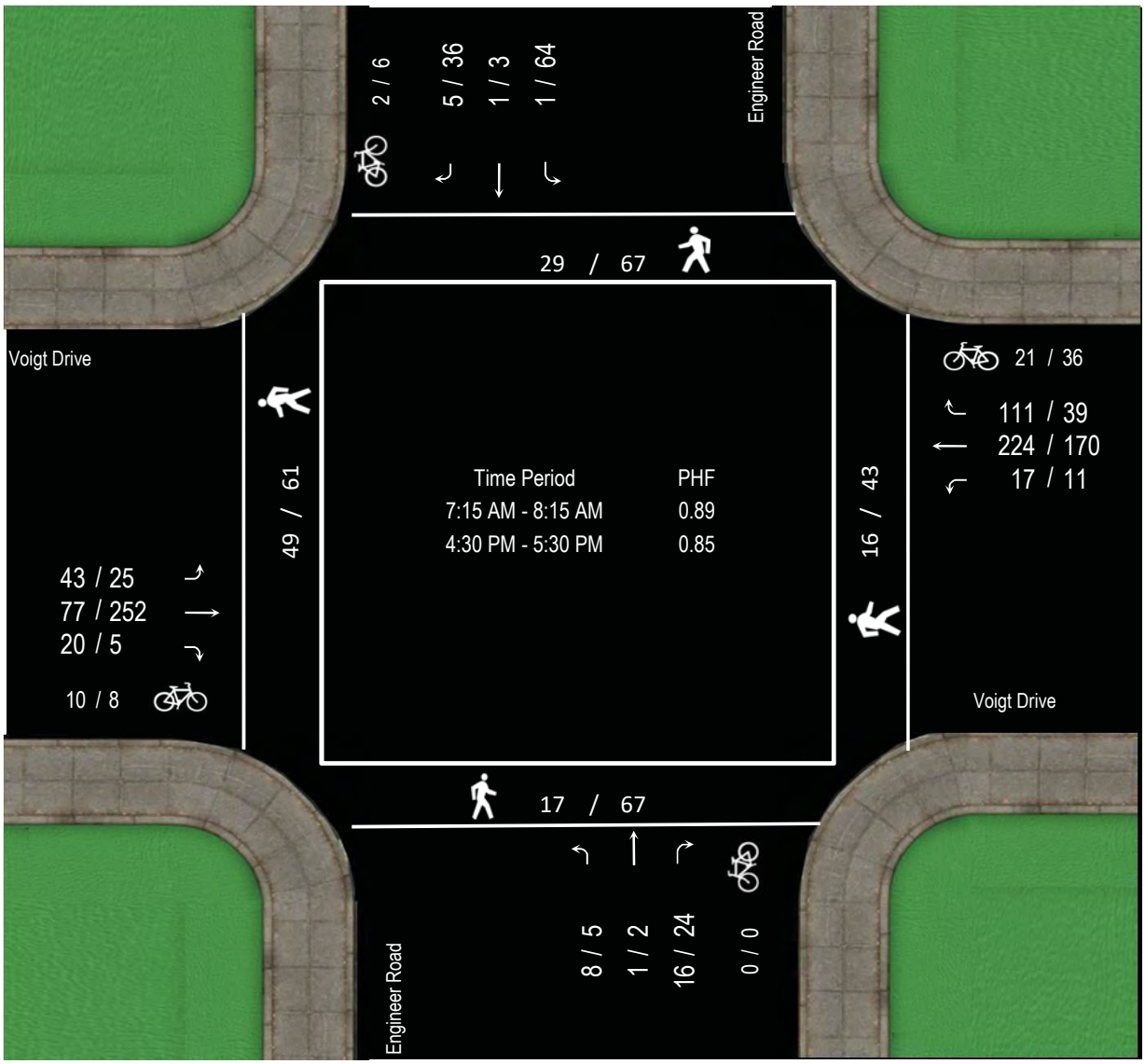
Location: Voigt Drive @ Engineer Road

Date of Count: *Thursday, October 27, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0580*



Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Voigt Drive @ Engineer Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
7:00 AM	0	0	3	9	41	3	0	0	1	2	16	4	79
7:15 AM	0	0	0	12	87	6	4	0	2	7	9	9	136
7:30 AM	2	0	0	28	47	4	3	1	3	4	18	9	119
7:45 AM	2	1	0	50	41	2	2	0	1	6	27	16	148
8:00 AM	1	0	1	21	49	5	7	0	2	3	23	9	121
8:15 AM	0	0	0	23	37	1	2	1	2	2	22	5	95
8:30 AM	6	0	1	24	41	4	2	0	0	3	19	11	111
8:45 AM	7	0	1	13	47	2	2	0	3	4	19	3	101
Total	18	1	6	180	390	27	22	2	14	31	153	66	910

AM Intersection Peak Hour : **7:15 AM - 8:15 AM** Intersection PHF : **0.89**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	5	1	1	111	224	17	16	1	8	20	77	43	524
PHF	0.63	0.25	0.25	0.56	0.64	0.71	0.57	0.25	0.67	0.71	0.71	0.67	0.89
Movement PHF		0.58			0.84			0.69			0.71		0.89

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	TOTAL
4:00 PM	5	1	18	4	37	2	3	0	1	1	42	4	118
4:15 PM	4	0	13	3	31	2	1	1	3	1	63	1	123
4:30 PM	14	0	25	16	41	3	5	0	2	2	56	7	171
4:45 PM	7	3	16	14	32	2	11	2	0	1	39	1	128
5:00 PM	7	0	13	7	55	4	6	0	1	0	85	8	186
5:15 PM	8	0	10	2	42	2	2	0	2	2	72	9	151
5:30 PM	6	0	8	4	39	5	5	1	4	4	67	5	148
5:45 PM	2	1	10	7	38	4	7	0	2	1	54	6	132
Total	53	5	113	57	315	24	40	4	15	12	478	41	1,157

PM Intersection Peak Hour : **4:30 PM - 5:30 PM** Intersection PHF : **0.85**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	36	3	64	39	170	11	24	2	5	5	252	25	636
PHF	0.64	0.25	0.64	0.609	0.773	0.688	0.545	0.25	0.625	0.625	0.741	0.694	0.85
Movement PHF		0.66			0.83			0.60			0.76		0.85

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Voigt Drive @ Equality Lane

Date of Count: *Thursday, October 27, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0580*

LINSCOTT LAW & GREENSPAN engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

AVC

Location: Voigt Drive @ Equality Lane

AM Period (7:00 AM - 9:00 AM)								
	Southbound		Westbound			Eastbound		
	Right	Left	Right	Thru		Thru	Left	TOTAL
7:00 AM	1	1	2	52		18	1	75
7:15 AM	2	2	1	103		11	2	121
7:30 AM	1	1	1	78		20	1	102
7:45 AM	1	2	2	92		27	2	126
8:00 AM	1	2	0	74		30	1	108
8:15 AM	0	1	2	61		22	2	88
8:30 AM	4	2	3	65		20	2	96
8:45 AM	5	1	3	57		20	2	88
Total	15	12	14	582		168	13	804

AM Intersection Peak Hour : **7:15 AM - 8:15 AM** Intersection PHF : **0.91**

	Southbound		Westbound			Eastbound		TOTAL
	Right	Left	Right	Thru		Thru	Left	
Volume	5	7	4	347		88	6	457
PHF	0.63	0.88	0.50	0.84		0.73	0.75	0.91
Movement PHF	0.75			0.84		0.76		0.91

PM Period (4:00 PM - 6:00 PM)								
	Southbound		Westbound			Eastbound		
	Right	Left	Right	Thru		Thru	Left	TOTAL
4:00 PM	1	3	1	42		63	0	110
4:15 PM	1	2	6	35		76	1	121
4:30 PM	3	3	5	57		86	0	154
4:45 PM	3	0	5	45		64	2	119
5:00 PM	1	3	4	65		101	3	177
5:15 PM	1	2	1	45		83	1	133
5:30 PM	2	1	2	46		77	3	131
5:45 PM	4	3	5	45		68	3	128
Total	16	17	29	380		618	13	1,073

PM Intersection Peak Hour : **4:30 PM - 5:30 PM** Intersection PHF : **0.82**

	Southbound		Westbound			Eastbound		TOTAL
	Right	Left	Right	Thru		Thru	Left	
Volume	8	8	15	212		334	6	583
PHF	0.67	0.667	0.75	0.815		0.827	0.5	0.82
Movement PHF	0.67			0.82		0.82		0.82

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Unknown Road Adjacent to Lot P[illegible] @ Engineer Lane

Date of Count: *Thursday, October 27, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0580*

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: known Road Adjacent to Lot P503 @ Engineer Lane

AM Period (7:00 AM - 9:00 AM)								
	Southbound			Northbound		Eastbound		
	Right	Thru		Thru	Left	Right	Left	TOTAL
7:00 AM	2	3		1	0	0	0	6
7:15 AM	8	5		3	0	0	3	19
7:30 AM	5	3		2	0	0	5	15
7:45 AM	4	5		1	0	1	2	13
8:00 AM	4	4		6	0	0	3	17
8:15 AM	2	0		2	0	0	3	7
8:30 AM	7	0		0	0	0	2	9
8:45 AM	3	3		2	1	0	3	12
Total	35	23		17	1	1	21	98

AM Intersection Peak Hour : **7:15 AM - 8:15 AM** Intersection PHF : **0.84**

	Southbound			Northbound		Eastbound		TOTAL
	Right	Thru		Thru	Left	Right	Left	
Volume	21	17		12	0	1	13	64
PHF	0.66	0.85		0.50	#####	0.25	0.65	0.84
Movement PHF		0.73		0.50		0.70		0.84

PM Period (4:00 PM - 6:00 PM)								
	Southbound			Northbound		Eastbound		
	Right	Thru		Thru	Left	Right	Left	TOTAL
4:00 PM	3	1		1	0	0	3	8
4:15 PM	1	2		1	1	0	4	9
4:30 PM	4	1		1	0	0	6	12
4:45 PM	4	2		3	0	1	10	20
5:00 PM	3	1		0	0	0	7	11
5:15 PM	3	1		1	0	0	3	8
5:30 PM	5	3		2	0	0	8	18
5:45 PM	2	4		4	0	0	5	15
Total	25	15		13	1	1	46	101

PM Intersection Peak Hour : **4:45 PM - 5:45 PM** Intersection PHF : **0.71**

	Southbound			Northbound		Eastbound		TOTAL
	Right	Thru		Thru	Left	Right	Left	
Volume	15	7		6	0	1	28	57
PHF	0.75	0.583		0.5	#####	0.25	0.7	0.71
Movement PHF		0.69		0.50		0.66		0.71

24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: A. Engineer Lane, just south of Voigt Drive

Orientation: *North-South*

Date of Count: *Thursday, October 27, 2016*

Analysts: *DASH*

Weather: *Sunny*

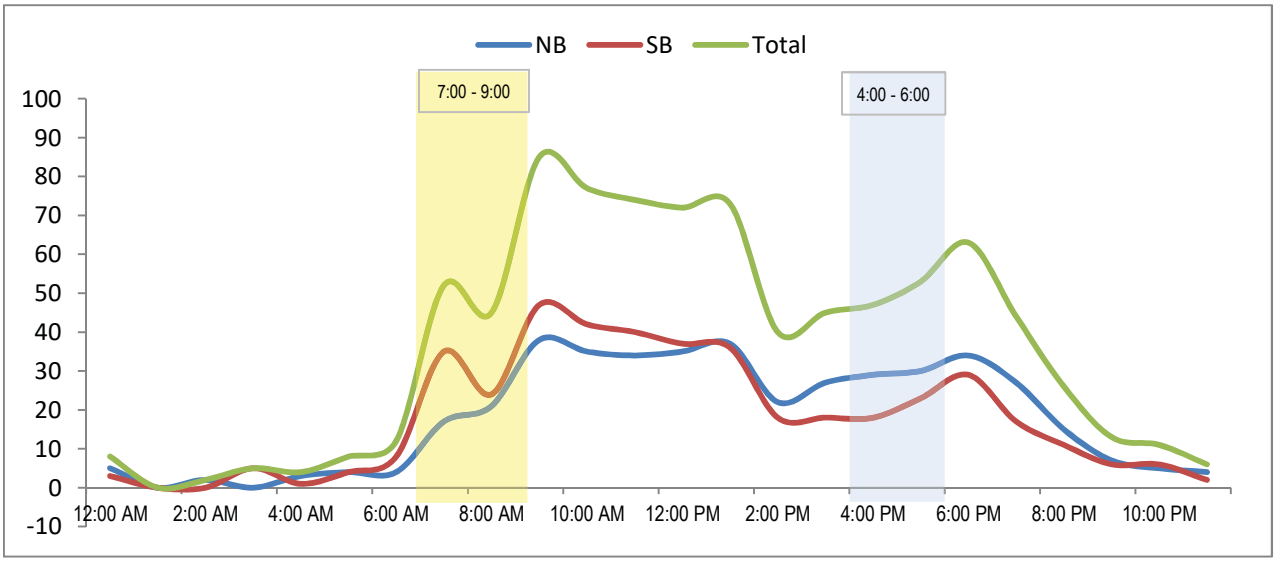
AVC Proj. No: *16-0580*

24 Hour Segment Volume			865

Time	Hourly Volume		
	NB	SB	Total
12:00 AM - 1:00 AM	5	3	8
1:00 AM - 2:00 AM	0	0	0
2:00 AM - 3:00 AM	2	0	2
3:00 AM - 4:00 AM	0	5	5
4:00 AM - 5:00 AM	3	1	4
5:00 AM - 6:00 AM	4	4	8
6:00 AM - 7:00 AM	4	8	12
7:00 AM - 8:00 AM	17	35	52
8:00 AM - 9:00 AM	21	24	45
9:00 AM - 10:00 AM	38	47	85
10:00 AM - 11:00 AM	35	42	77
11:00 AM - 12:00 PM	34	40	74
Total	**163**	**209**	**372**

Time	Hourly Volume		
	NB	SB	Total
12:00 PM - 1:00 PM	35	37	72
1:00 PM - 2:00 PM	37	36	73
2:00 PM - 3:00 PM	22	18	40
3:00 PM - 4:00 PM	27	18	45
4:00 PM - 5:00 PM	29	18	47
5:00 PM - 6:00 PM	30	23	53
6:00 PM - 7:00 PM	34	29	63
7:00 PM - 8:00 PM	27	17	44
8:00 PM - 9:00 PM	15	11	26
9:00 PM - 10:00 PM	7	6	13
10:00 PM - 11:00 PM	5	6	11
11:00 PM - 12:00 AM	4	2	6
Total	**272**	**221**	**493**

24-Hour NB Volume	435	24-Hour SB Volume	430



24 Hour Segment Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: B. Parking Lot P502, just north of Voigt Drive

Orientation: *North-South*

Date of Count: *Thursday, October 27, 2016*

Analysts: *DASH*

Weather: *Sunny*

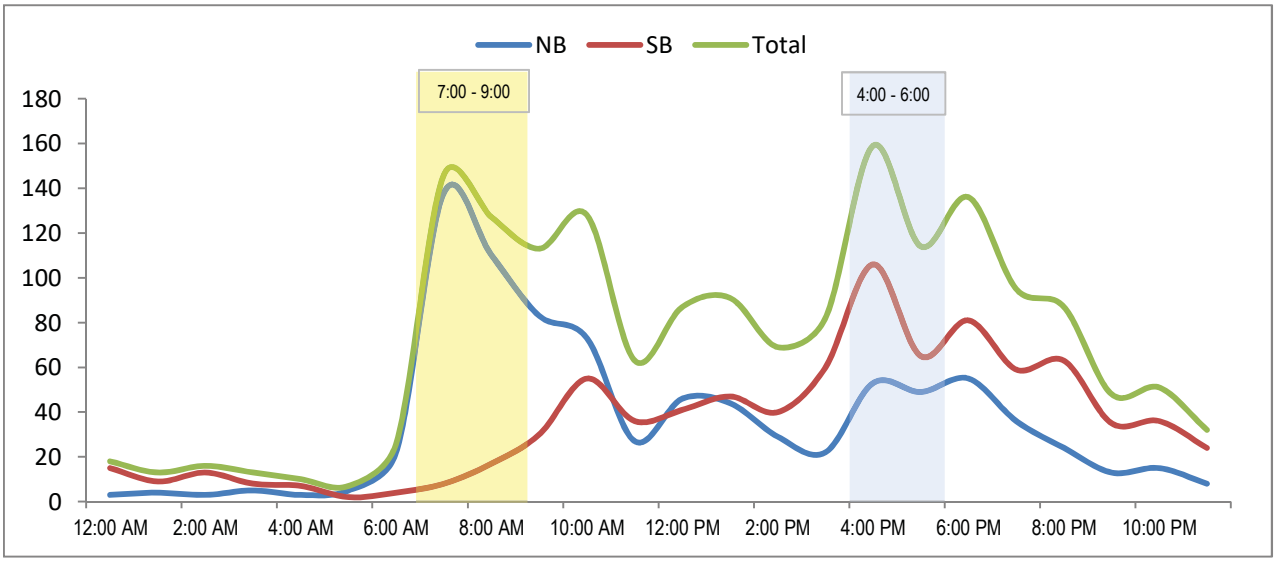
AVC Proj. No: *16-0580*

24 Hour Segment Volume			1,731

Time	Hourly Volume		
	NB	SB	Total
12:00 AM - 1:00 AM	3	15	18
1:00 AM - 2:00 AM	4	9	13
2:00 AM - 3:00 AM	3	13	16
3:00 AM - 4:00 AM	5	8	13
4:00 AM - 5:00 AM	3	7	10
5:00 AM - 6:00 AM	5	2	7
6:00 AM - 7:00 AM	22	4	26
7:00 AM - 8:00 AM	138	8	146
8:00 AM - 9:00 AM	110	17	127
9:00 AM - 10:00 AM	83	30	113
10:00 AM - 11:00 AM	73	55	128
11:00 AM - 12:00 PM	27	36	63
Total	**476**	**204**	**680**

Time	Hourly Volume		
	NB	SB	Total
12:00 PM - 1:00 PM	46	41	87
1:00 PM - 2:00 PM	44	47	91
2:00 PM - 3:00 PM	29	40	69
3:00 PM - 4:00 PM	22	60	82
4:00 PM - 5:00 PM	53	106	159
5:00 PM - 6:00 PM	49	65	114
6:00 PM - 7:00 PM	55	81	136
7:00 PM - 8:00 PM	36	59	95
8:00 PM - 9:00 PM	24	63	87
9:00 PM - 10:00 PM	13	35	48
10:00 PM - 11:00 PM	15	36	51
11:00 PM - 12:00 AM	8	24	32
Total	**394**	**657**	**1,051**

24-Hour NB Volume	870	24-Hour SB Volume	861



APPENDIX C

ANALYSIS METHODOLOGY

ANALYSIS APPROACH AND METHODOLOGY

Level of service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments.

Intersections

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and Levels of Service (LOS) was determined based upon the procedures found in Chapter 19 and Chapter 20 of the *2010 Highway Capacity Manual (HCM)*, with the assistance of the *Synchro 9* computer software. For unsignalized intersections, LOS is determined by the computed or measured control delay and is defined for each minor movement. For all-way stop controlled intersections, LOS is computed for the overall intersection. For one or two-way stop controlled intersections, LOS is computed for the critical movement, and is not defined for the intersection as a whole. A more detailed explanation of the methodology is provided on the following page.

2010 HIGHWAY CAPACITY MANUAL LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

In the 2010 Highway Capacity Manual (HCM), Level of Service for unsignalized intersections is determined by the computed or measured control delay and is defined for each minor movement. Level of Service is not defined for the intersection as a whole. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. The criteria are given in the following the table, and are based on the average control delay for any particular minor movement.

LEVEL OF SERVICE	AVERAGE CONTROL DELAY SEC/VEH			EXPECTED DELAY TO MINOR STREET TRAFFIC
A	0.0	≤	10.0	Little or no delay
B	10.1	to	15.0	Short traffic delays
C	15.1	to	25.0	Average traffic delays
D	25.1	to	35.0	Long traffic delays
E	35.1	to	50.0	Very long traffic delays
F		>	50.0	Severe congestion

Level of Service F exists when there are insufficient gaps of suitable size to allow a side street demand to safely cross through a major street traffic stream. This Level of Service is generally evident from extremely long control delays experienced by side-street traffic and by queuing on the minor-street approaches. The method, however, is based on a constant critical gap size; that is, the critical gap remains constant no matter how long the side-street motorist waits. LOS F may also appear in the form on side-street vehicles selecting smaller-than-usual gaps. In such cases, safety may be a problem, and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior, which are more difficult to observe in the field than queuing.

In most cases at Two-Way Stop Controlled (TWSC) intersections, the critical movement is the minor-street left-turn movement. As such, the minor-street left-turn movement can generally be considered the primary factor affecting overall intersection performance. The lower threshold for LOS F is set at 50 seconds of delay per vehicle. There are many instances, particularly in urban areas, in which the delay equations will predict delays of 50 seconds (LOS F) or more for minor-street movements under very low volume conditions on the minor street (less than 25 vehicle/hour). Since the first term of the equation is a function only of the capacity, the LOS F threshold of 50 sec/vehicle is reached with a movement capacity of approximately 85 vehicle/hour or less.

This procedure assumes random arrivals on the major street. For a typical four-lane arterial with average daily traffic volumes in the range of 15,000 to 20,000 vehicles per day (peak hour, 1,500 to 2,000 vehicle/hour), the delay equation used in the TWSC capacity analysis procedure will predict 50 seconds of delay or more (LOS F) for many urban TWSC intersections that allow minor-street left-turn movements. **The LOS F threshold will be reached regardless of the volume of minor-street left-turn traffic.** Not-withstanding this fact, most low-volume minor-street approaches would not meet any of the volume or delay warrants for signalization of the *Manual on Uniform Traffic Control Devices* (MUTCD) since the warrants define an asymptote at 100 vehicle/hour on the minor approach. As a result, many public agencies that use the HCM Level of Service thresholds to determine the design adequacy of TWSC intersections may be forced to eliminate the minor-street left-turn movement, even when the movement may not present any operational problem, such as the formation of long queues on the minor street or driveway approach.

APPENDIX D

EXISTING ANALYSIS CALCULATION WORKSHEETS

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	16	18	1	0	14	55	168	0	1	4	9
Future Vol, veh/h	0	16	18	1	0	14	55	168	0	1	4	9
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	18	20	1	0	15	60	185	0	1	4	10
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	1
HCM Control Delay	8.2	9	7.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	7%	46%	6%	81%	0%
Vol Thru, %	29%	51%	23%	19%	0%
Vol Right, %	64%	3%	71%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	14	35	237	140	67
LT Vol	1	16	14	113	0
Through Vol	4	18	55	27	0
RT Vol	9	1	168	0	67
Lane Flow Rate	15	38	260	154	74
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.02	0.052	0.303	0.24	0.092
Departure Headway (Hd)	4.609	4.909	4.185	5.605	4.495
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	773	729	859	640	795
Service Time	2.658	2.943	2.205	3.345	2.234
HCM Lane V/C Ratio	0.019	0.052	0.303	0.241	0.093
HCM Control Delay	7.8	8.2	9	10.1	7.7
HCM Lane LOS	A	A	A	B	A
HCM 95th-tile Q	0.1	0.2	1.3	0.9	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	113	27	67
Future Vol, veh/h	0	113	27	67
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	124	30	74
Number of Lanes	0	0	1	1

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

Lane

Intersection	
Intersection Delay, s/veh	9.4
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	43	77	20	0	17	224	111	0	8	1	16	0	1	1	5
Future Vol, veh/h	0	43	77	20	0	17	224	111	0	8	1	16	0	1	1	5
Peak Hour Factor	0.92	0.89	0.89	0.89	0.92	0.89	0.89	0.89	0.92	0.89	0.89	0.89	0.92	0.89	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	48	87	22	0	19	252	125	0	9	1	18	0	1	1	6
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.4	10	8	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	32%	31%	5%	14%
Vol Thru, %	4%	55%	64%	14%
Vol Right, %	64%	14%	32%	71%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	25	140	352	7
LT Vol	8	43	17	1
Through Vol	1	77	224	1
RT Vol	16	20	111	5
Lane Flow Rate	28	157	396	8
Geometry Grp	1	1	1	1
Degree of Util (X)	0.037	0.187	0.432	0.01
Departure Headway (Hd)	4.78	4.27	3.935	4.73
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	754	826	906	761
Service Time	2.78	2.37	2.006	2.731
HCM Lane V/C Ratio	0.037	0.19	0.437	0.011
HCM Control Delay	8	8.4	10	7.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.7	2.2	0

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Traffic Vol, veh/h	0	6	88	0	347	4	0	7	5
Future Vol, veh/h	0	6	88	0	347	4	0	7	5
Peak Hour Factor	0.92	0.91	0.91	0.92	0.91	0.91	0.92	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	7	97	0	381	4	0	8	5
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.9	10.1	7.9
HCM LOS	A	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	0%	58%
Vol Thru, %	94%	99%	0%
Vol Right, %	0%	1%	42%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	94	351	12
LT Vol	6	0	7
Through Vol	88	347	0
RT Vol	0	4	5
Lane Flow Rate	103	386	13
Geometry Grp	1	1	1
Degree of Util (X)	0.122	0.432	0.018
Departure Headway (Hd)	4.258	4.028	4.846
Convergence, Y/N	Yes	Yes	Yes
Cap	831	891	743
Service Time	2.345	2.065	2.846
HCM Lane V/C Ratio	0.124	0.433	0.017
HCM Control Delay	7.9	10.1	7.9
HCM Lane LOS	A	B	A
HCM 95th-tile Q	0.4	2.2	0.1

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	13	1	0	12	17	21
Future Vol, veh/h	13	1	0	12	17	21
Conflicting Peds, #/hr	10	10	20	0	0	20
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	1	0	14	20	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	57	63	55	0	-	0
Stage 1	43	-	-	-	-	-
Stage 2	14	-	-	-	-	-
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	950	1002	1550	-	-	-
Stage 1	979	-	-	-	-	-
Stage 2	1009	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	932	974	1520	-	-	-
Mov Cap-2 Maneuver	932	-	-	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	999	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1520	-	935	-	-
HCM Lane V/C Ratio	-	-	0.018	-	-
HCM Control Delay (s)	0	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Intersection Delay, s/veh	11.7
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	89	78	5	0	6	54	151	0	0	15	29
Future Vol, veh/h	0	89	78	5	0	6	54	151	0	0	15	29
Peak Hour Factor	0.92	0.86	0.86	0.86	0.92	0.86	0.86	0.86	0.92	0.86	0.86	0.86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	103	91	6	0	7	63	176	0	0	17	34
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	1
HCM Control Delay	10.9	10.4	8.9
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	0%	52%	3%	87%	0%
Vol Thru, %	34%	45%	26%	13%	0%
Vol Right, %	66%	3%	72%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	44	172	211	237	42
LT Vol	0	89	6	206	0
Through Vol	15	78	54	31	0
RT Vol	29	5	151	0	42
Lane Flow Rate	51	200	245	276	49
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.077	0.305	0.33	0.476	0.069
Departure Headway (Hd)	5.407	5.485	4.968	6.22	5.073
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	664	656	729	581	709
Service Time	3.432	3.512	2.968	3.934	2.786
HCM Lane V/C Ratio	0.077	0.305	0.336	0.475	0.069
HCM Control Delay	8.9	10.9	10.4	14.5	8.2
HCM Lane LOS	A	B	B	B	A
HCM 95th-tile Q	0.2	1.3	1.4	2.6	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	206	31	42
Future Vol, veh/h	0	206	31	42
Peak Hour Factor	0.92	0.86	0.86	0.86
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	240	36	49
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	13.6
HCM LOS	B

Lane

Intersection	
Intersection Delay, s/veh	10.9
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	25	283	5	0	11	170	39	0	5	5	24	0	64	6	36
Future Vol, veh/h	0	25	283	5	0	11	170	39	0	5	5	24	0	64	6	36
Peak Hour Factor	0.92	0.85	0.85	0.85	0.92	0.85	0.85	0.85	0.92	0.85	0.85	0.85	0.92	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	29	333	6	0	13	200	46	0	6	6	28	0	75	7	42
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12	10.2	8.6	9.6
HCM LOS	B	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	8%	5%	60%
Vol Thru, %	15%	90%	77%	6%
Vol Right, %	71%	2%	18%	34%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	34	313	220	106
LT Vol	5	25	11	64
Through Vol	5	283	170	6
RT Vol	24	5	39	36
Lane Flow Rate	40	368	259	125
Geometry Grp	1	1	1	1
Degree of Util (X)	0.057	0.478	0.337	0.185
Departure Headway (Hd)	5.17	4.67	4.693	5.33
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	684	766	761	667
Service Time	3.269	2.727	2.757	3.413
HCM Lane V/C Ratio	0.058	0.48	0.34	0.187
HCM Control Delay	8.6	12	10.2	9.6
HCM Lane LOS	A	B	B	A
HCM 95th-tile Q	0.2	2.6	1.5	0.7

Intersection	
Intersection Delay, s/veh	11
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Traffic Vol, veh/h	0	6	365	0	212	15	0	8	8
Future Vol, veh/h	0	6	365	0	212	15	0	8	8
Peak Hour Factor	0.92	0.82	0.82	0.92	0.82	0.82	0.92	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	7	445	0	259	18	0	10	10
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	11.9	9.6	8.5
HCM LOS	B	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	0%	50%
Vol Thru, %	98%	93%	0%
Vol Right, %	0%	7%	50%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	371	227	16
LT Vol	6	0	8
Through Vol	365	212	0
RT Vol	0	15	8
Lane Flow Rate	452	277	20
Geometry Grp	1	1	1
Degree of Util (X)	0.525	0.338	0.029
Departure Headway (Hd)	4.28	4.391	5.28
Convergence, Y/N	Yes	Yes	Yes
Cap	846	822	680
Service Time	2.28	2.395	3.296
HCM Lane V/C Ratio	0.534	0.337	0.029
HCM Control Delay	11.9	9.6	8.5
HCM Lane LOS	B	A	A
HCM 95th-tile Q	3.1	1.5	0.1

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	28	1	0	6	7	15
Future Vol, veh/h	28	1	0	6	7	15
Conflicting Peds, #/hr	20	20	33	0	0	33
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	1	0	8	10	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	48	73	51	0	-	0
Stage 1	40	-	-	-	-	-
Stage 2	8	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	962	989	1555	-	-	-
Stage 1	982	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	926	940	1506	-	-	-
Mov Cap-2 Maneuver	926	-	-	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	996	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1506	-	926	-	-
HCM Lane V/C Ratio	-	-	0.044	-	-
HCM Control Delay (s)	0	-	9.1	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

APPENDIX E

EXISTING + PROJECT INTERSECTION ANALYSIS CALCULATION WORKSHEETS

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	16	18	1	0	14	55	169	0	1	4	9
Future Vol, veh/h	0	16	18	1	0	14	55	169	0	1	4	9
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	18	20	1	0	15	60	186	0	1	4	10
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	1
HCM Control Delay	8.5	9.5	7.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	7%	46%	6%	87%	0%
Vol Thru, %	29%	51%	23%	13%	0%
Vol Right, %	64%	3%	71%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	14	35	238	210	67
LT Vol	1	16	14	183	0
Through Vol	4	18	55	27	0
RT Vol	9	1	169	0	67
Lane Flow Rate	15	38	262	231	74
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.02	0.055	0.319	0.363	0.092
Departure Headway (Hd)	4.741	5.142	4.396	5.661	4.518
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	749	694	819	635	789
Service Time	2.809	3.191	2.424	3.414	2.271
HCM Lane V/C Ratio	0.02	0.055	0.32	0.364	0.094
HCM Control Delay	7.9	8.5	9.5	11.6	7.7
HCM Lane LOS	A	A	A	B	A
HCM 95th-tile Q	0.1	0.2	1.4	1.7	0.3

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	183	27	67
Future Vol, veh/h	0	183	27	67
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	201	30	74
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	10.7
HCM LOS	B

Lane

Intersection	
Intersection Delay, s/veh	13.7
Intersection LOS	B

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	84	31	0	280	224	0	14	23
Future Vol, veh/h	0	84	31	0	280	224	0	14	23
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.92	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	94	35	0	315	252	0	16	26
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.3	15.3	8.5
HCM LOS	A	C	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	38%	0%	56%
Vol Thru, %	0%	73%	44%
Vol Right, %	62%	27%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	37	115	504
LT Vol	14	0	280
Through Vol	0	84	224
RT Vol	23	31	0
Lane Flow Rate	42	129	566
Geometry Grp	1	1	1
Degree of Util (X)	0.06	0.16	0.663
Departure Headway (Hd)	5.158	4.447	4.216
Convergence, Y/N	Yes	Yes	Yes
Cap	697	809	844
Service Time	3.168	2.458	2.301
HCM Lane V/C Ratio	0.06	0.159	0.671
HCM Control Delay	8.5	8.3	15.3
HCM Lane LOS	A	A	C
HCM 95th-tile Q	0.2	0.6	5.1

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Traffic Vol, veh/h	0	6	101	0	499	4	0	7	5
Future Vol, veh/h	0	6	101	0	499	4	0	7	5
Peak Hour Factor	0.92	0.91	0.91	0.92	0.91	0.91	0.92	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	7	111	0	548	4	0	8	5
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8.3	13.5	8.3
HCM LOS	A	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	0%	58%
Vol Thru, %	94%	99%	0%
Vol Right, %	0%	1%	42%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	107	503	12
LT Vol	6	0	7
Through Vol	101	499	0
RT Vol	0	4	5
Lane Flow Rate	118	553	13
Geometry Grp	1	1	1
Degree of Util (X)	0.147	0.62	0.019
Departure Headway (Hd)	4.502	4.041	5.229
Convergence, Y/N	Yes	Yes	Yes
Cap	801	890	688
Service Time	2.504	2.09	3.235
HCM Lane V/C Ratio	0.147	0.621	0.019
HCM Control Delay	8.3	13.5	8.3
HCM Lane LOS	A	B	A
HCM 95th-tile Q	0.5	4.4	0.1

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	12	1	0	12	17	20
Future Vol, veh/h	12	1	0	12	17	20
Conflicting Peds, #/hr	10	10	20	0	0	20
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	1	0	14	20	24

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	56	62	54	0	-	0
Stage 1	42	-	-	-	-	-
Stage 2	14	-	-	-	-	-
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	952	1003	1551	-	-	-
Stage 1	980	-	-	-	-	-
Stage 2	1009	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	934	975	1521	-	-	-
Mov Cap-2 Maneuver	934	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	999	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1521	-	937	-	-
HCM Lane V/C Ratio	-	-	0.017	-	-
HCM Control Delay (s)	0	-	8.9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Intersection Delay, s/veh	12.8
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	89	78	5	0	6	54	204	0	0	15	29
Future Vol, veh/h	0	89	78	5	0	6	54	204	0	0	15	29
Peak Hour Factor	0.92	0.86	0.86	0.86	0.92	0.86	0.86	0.86	0.92	0.86	0.86	0.86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	103	91	6	0	7	63	237	0	0	17	34
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	1
HCM Control Delay	11.4	11.8	9.2
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	0%	52%	2%	88%	0%
Vol Thru, %	34%	45%	20%	12%	0%
Vol Right, %	66%	3%	77%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	44	172	264	256	42
LT Vol	0	89	6	225	0
Through Vol	15	78	54	31	0
RT Vol	29	5	204	0	42
Lane Flow Rate	51	200	307	298	49
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.081	0.316	0.427	0.53	0.071
Departure Headway (Hd)	5.672	5.692	5.013	6.404	5.25
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	629	630	715	563	682
Service Time	3.728	3.739	3.057	4.14	2.985
HCM Lane V/C Ratio	0.081	0.317	0.429	0.529	0.072
HCM Control Delay	9.2	11.4	11.8	16.2	8.4
HCM Lane LOS	A	B	B	C	A
HCM 95th-tile Q	0.3	1.4	2.1	3.1	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	225	31	42
Future Vol, veh/h	0	225	31	42
Peak Hour Factor	0.92	0.86	0.86	0.86
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	262	36	49
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	15.1
HCM LOS	C

Lane

Intersection	
Intersection Delay, s/veh	16.5
Intersection LOS	C

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	431	9	0	113	170	0	94	84
Future Vol, veh/h	0	431	9	0	113	170	0	94	84
Peak Hour Factor	0.92	0.85	0.85	0.92	0.85	0.85	0.92	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	507	11	0	133	200	0	111	99
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	20.3	13.6	11.9
HCM LOS	C	B	B

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	53%	0%	40%
Vol Thru, %	0%	98%	60%
Vol Right, %	47%	2%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	178	440	283
LT Vol	94	0	113
Through Vol	0	431	170
RT Vol	84	9	0
Lane Flow Rate	209	518	333
Geometry Grp	1	1	1
Degree of Util (X)	0.34	0.726	0.496
Departure Headway (Hd)	5.851	5.048	5.362
Convergence, Y/N	Yes	Yes	Yes
Cap	614	714	673
Service Time	3.894	3.077	3.396
HCM Lane V/C Ratio	0.34	0.725	0.495
HCM Control Delay	11.9	20.3	13.6
HCM Lane LOS	B	C	B
HCM 95th-tile Q	1.5	6.3	2.8

Intersection	
Intersection Delay, s/veh	16.6
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Traffic Vol, veh/h	0	6	509	0	275	15	0	8	8
Future Vol, veh/h	0	6	509	0	275	15	0	8	8
Peak Hour Factor	0.92	0.82	0.82	0.92	0.82	0.82	0.92	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	7	621	0	335	18	0	10	10
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	19.8	11.3	9
HCM LOS	C	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	0%	50%
Vol Thru, %	99%	95%	0%
Vol Right, %	0%	5%	50%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	515	290	16
LT Vol	6	0	8
Through Vol	509	275	0
RT Vol	0	15	8
Lane Flow Rate	628	354	20
Geometry Grp	1	1	1
Degree of Util (X)	0.76	0.45	0.031
Departure Headway (Hd)	4.359	4.584	5.801
Convergence, Y/N	Yes	Yes	Yes
Cap	829	785	615
Service Time	2.378	2.607	3.86
HCM Lane V/C Ratio	0.758	0.451	0.033
HCM Control Delay	19.8	11.3	9
HCM Lane LOS	C	B	A
HCM 95th-tile Q	7.3	2.4	0.1

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	23	1	0	6	7	9
Future Vol, veh/h	23	1	0	6	7	9
Conflicting Peds, #/hr	25	25	35	0	0	33
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	1	0	8	10	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	49	76	48	0	-	0
Stage 1	41	-	-	-	-	-
Stage 2	8	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	960	985	1559	-	-	-
Stage 1	981	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	915	929	1507	-	-	-
Mov Cap-2 Maneuver	915	-	-	-	-	-
Stage 1	958	-	-	-	-	-
Stage 2	991	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1507	-	916	-	-
HCM Lane V/C Ratio	-	-	0.037	-	-
HCM Control Delay (s)	0	-	9.1	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	16	18	1	0	14	55	169	0	1	4	9
Future Vol, veh/h	0	16	18	1	0	14	55	169	0	1	4	9
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	18	20	1	0	15	60	186	0	1	4	10
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	1
HCM Control Delay	8.5	9.5	7.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	7%	46%	6%	87%	0%
Vol Thru, %	29%	51%	23%	13%	0%
Vol Right, %	64%	3%	71%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	14	35	238	210	67
LT Vol	1	16	14	183	0
Through Vol	4	18	55	27	0
RT Vol	9	1	169	0	67
Lane Flow Rate	15	38	262	231	74
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.02	0.055	0.319	0.363	0.092
Departure Headway (Hd)	4.741	5.142	4.396	5.661	4.518
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	749	694	819	635	789
Service Time	2.809	3.191	2.424	3.414	2.271
HCM Lane V/C Ratio	0.02	0.055	0.32	0.364	0.094
HCM Control Delay	7.9	8.5	9.5	11.6	7.7
HCM Lane LOS	A	A	A	B	A
HCM 95th-tile Q	0.1	0.2	1.4	1.7	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	183	27	67
Future Vol, veh/h	0	183	27	67
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	201	30	74
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	10.7
HCM LOS	B

Lane

Intersection	
Intersection Delay, s/veh	13.8
Intersection LOS	B

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	77	31	0	280	224	0	14	30
Future Vol, veh/h	0	77	31	0	280	224	0	14	30
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.92	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	87	35	0	315	252	0	16	34
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.3	15.4	8.5
HCM LOS	A	C	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	32%	0%	56%
Vol Thru, %	0%	71%	44%
Vol Right, %	68%	29%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	44	108	504
LT Vol	14	0	280
Through Vol	0	77	224
RT Vol	30	31	0
Lane Flow Rate	49	121	566
Geometry Grp	1	1	1
Degree of Util (X)	0.07	0.15	0.664
Departure Headway (Hd)	5.097	4.46	4.224
Convergence, Y/N	Yes	Yes	Yes
Cap	706	807	844
Service Time	3.106	2.471	2.313
HCM Lane V/C Ratio	0.069	0.15	0.671
HCM Control Delay	8.5	8.3	15.4
HCM Lane LOS	A	A	C
HCM 95th-tile Q	0.2	0.5	5.2

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Traffic Vol, veh/h	0	6	101	0	499	4	0	7	5
Future Vol, veh/h	0	6	101	0	499	4	0	7	5
Peak Hour Factor	0.92	0.91	0.91	0.92	0.91	0.91	0.92	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	7	111	0	548	4	0	8	5
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8.3	13.5	8.3
HCM LOS	A	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	0%	58%
Vol Thru, %	94%	99%	0%
Vol Right, %	0%	1%	42%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	107	503	12
LT Vol	6	0	7
Through Vol	101	499	0
RT Vol	0	4	5
Lane Flow Rate	118	553	13
Geometry Grp	1	1	1
Degree of Util (X)	0.147	0.62	0.019
Departure Headway (Hd)	4.502	4.041	5.229
Convergence, Y/N	Yes	Yes	Yes
Cap	801	890	688
Service Time	2.504	2.09	3.235
HCM Lane V/C Ratio	0.147	0.621	0.019
HCM Control Delay	8.3	13.5	8.3
HCM Lane LOS	A	B	A
HCM 95th-tile Q	0.5	4.4	0.1

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	32	1	0	12	17	294
Future Vol, veh/h	32	1	0	12	17	294
Conflicting Peds, #/hr	10	10	20	0	0	20
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	1	0	14	20	350

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	219	225	380	0	-	0
Stage 1	205	-	-	-	-	-
Stage 2	14	-	-	-	-	-
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	769	814	1178	-	-	-
Stage 1	829	-	-	-	-	-
Stage 2	1009	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	754	791	1156	-	-	-
Mov Cap-2 Maneuver	754	-	-	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	999	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1156	-	755	-	-
HCM Lane V/C Ratio	-	-	0.052	-	-
HCM Control Delay (s)	0	-	10	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Intersection Delay, s/veh	12.8
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	89	78	5	0	6	54	204	0	0	15	29
Future Vol, veh/h	0	89	78	5	0	6	54	204	0	0	15	29
Peak Hour Factor	0.92	0.86	0.86	0.86	0.92	0.86	0.86	0.86	0.92	0.86	0.86	0.86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	103	91	6	0	7	63	237	0	0	17	34
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	1
HCM Control Delay	11.4	11.8	9.2
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	0%	52%	2%	88%	0%
Vol Thru, %	34%	45%	20%	12%	0%
Vol Right, %	66%	3%	77%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	44	172	264	256	42
LT Vol	0	89	6	225	0
Through Vol	15	78	54	31	0
RT Vol	29	5	204	0	42
Lane Flow Rate	51	200	307	298	49
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.081	0.316	0.427	0.53	0.071
Departure Headway (Hd)	5.672	5.692	5.013	6.404	5.25
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	629	630	715	563	682
Service Time	3.728	3.739	3.057	4.14	2.985
HCM Lane V/C Ratio	0.081	0.317	0.429	0.529	0.072
HCM Control Delay	9.2	11.4	11.8	16.2	8.4
HCM Lane LOS	A	B	B	C	A
HCM 95th-tile Q	0.3	1.4	2.1	3.1	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	225	31	42
Future Vol, veh/h	0	225	31	42
Peak Hour Factor	0.92	0.86	0.86	0.86
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	262	36	49
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	15.1
HCM LOS	C

Lane

Intersection	
Intersection Delay, s/veh	15.1
Intersection LOS	C

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	283	9	0	113	170	0	94	232
Future Vol, veh/h	0	283	9	0	113	170	0	94	232
Peak Hour Factor	0.92	0.85	0.85	0.92	0.85	0.85	0.92	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	333	11	0	133	200	0	111	273
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	14.8	14.8	15.5
HCM LOS	B	B	C

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	29%	0%	40%
Vol Thru, %	0%	97%	60%
Vol Right, %	71%	3%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	326	292	283
LT Vol	94	0	113
Through Vol	0	283	170
RT Vol	232	9	0
Lane Flow Rate	384	344	333
Geometry Grp	1	1	1
Degree of Util (X)	0.573	0.53	0.524
Departure Headway (Hd)	5.374	5.555	5.661
Convergence, Y/N	Yes	Yes	Yes
Cap	667	646	636
Service Time	3.428	3.61	3.717
HCM Lane V/C Ratio	0.576	0.533	0.524
HCM Control Delay	15.5	14.8	14.8
HCM Lane LOS	C	B	B
HCM 95th-tile Q	3.6	3.1	3.1

Intersection	
Intersection Delay, s/veh	16.6
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Traffic Vol, veh/h	0	6	509	0	275	15	0	8	8
Future Vol, veh/h	0	6	509	0	275	15	0	8	8
Peak Hour Factor	0.92	0.82	0.82	0.92	0.82	0.82	0.92	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	7	621	0	335	18	0	10	10
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	19.8	11.3	9
HCM LOS	C	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	0%	50%
Vol Thru, %	99%	95%	0%
Vol Right, %	0%	5%	50%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	515	290	16
LT Vol	6	0	8
Through Vol	509	275	0
RT Vol	0	15	8
Lane Flow Rate	628	354	20
Geometry Grp	1	1	1
Degree of Util (X)	0.76	0.45	0.031
Departure Headway (Hd)	4.359	4.584	5.801
Convergence, Y/N	Yes	Yes	Yes
Cap	829	785	615
Service Time	2.378	2.607	3.86
HCM Lane V/C Ratio	0.758	0.451	0.033
HCM Control Delay	19.8	11.3	9
HCM Lane LOS	C	B	A
HCM 95th-tile Q	7.3	2.4	0.1

Intersection	
Int Delay, s/veh	10.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	320	1	0	6	7	115
Future Vol, veh/h	320	1	0	6	7	115
Conflicting Peds, #/hr	20	20	33	0	0	33
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	451	1	0	8	10	162

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	119	144	192	0	-	0
Stage 1	111	-	-	-	-	-
Stage 2	8	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	877	903	1381	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	844	858	1338	-	-	-
Mov Cap-2 Maneuver	844	-	-	-	-	-
Stage 1	897	-	-	-	-	-
Stage 2	996	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1338	-	844	-	-
HCM Lane V/C Ratio	-	-	0.536	-	-
HCM Control Delay (s)	0	-	14.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	3.2	-	-

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	16	18	1	0	14	55	169	0	1	4	9
Future Vol, veh/h	0	16	18	1	0	14	55	169	0	1	4	9
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	18	20	1	0	15	60	186	0	1	4	10
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	1
HCM Control Delay	8.5	9.5	7.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	7%	46%	6%	87%	0%
Vol Thru, %	29%	51%	23%	13%	0%
Vol Right, %	64%	3%	71%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	14	35	238	210	67
LT Vol	1	16	14	183	0
Through Vol	4	18	55	27	0
RT Vol	9	1	169	0	67
Lane Flow Rate	15	38	262	231	74
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.02	0.055	0.319	0.363	0.092
Departure Headway (Hd)	4.741	5.142	4.396	5.661	4.518
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	749	694	819	635	789
Service Time	2.809	3.191	2.424	3.414	2.271
HCM Lane V/C Ratio	0.02	0.055	0.32	0.364	0.094
HCM Control Delay	7.9	8.5	9.5	11.6	7.7
HCM Lane LOS	A	A	A	B	A
HCM 95th-tile Q	0.1	0.2	1.4	1.7	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	183	27	67
Future Vol, veh/h	0	183	27	67
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	201	30	74
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	10.7
HCM LOS	B

Lane

Intersection	
Intersection Delay, s/veh	13.7
Intersection LOS	B

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	77	133	0	280	224	0	14	30
Future Vol, veh/h	0	77	133	0	280	224	0	14	30
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.92	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	87	149	0	315	252	0	16	34
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.9	16.2	8.7
HCM LOS	A	C	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	32%	0%	56%
Vol Thru, %	0%	37%	44%
Vol Right, %	68%	63%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	44	210	504
LT Vol	14	0	280
Through Vol	0	77	224
RT Vol	30	133	0
Lane Flow Rate	49	236	566
Geometry Grp	1	1	1
Degree of Util (X)	0.073	0.28	0.678
Departure Headway (Hd)	5.306	4.267	4.431
Convergence, Y/N	Yes	Yes	Yes
Cap	677	845	821
Service Time	3.325	2.281	2.431
HCM Lane V/C Ratio	0.072	0.279	0.689
HCM Control Delay	8.7	8.9	16.2
HCM Lane LOS	A	A	C
HCM 95th-tile Q	0.2	1.1	5.4

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Traffic Vol, veh/h	0	6	101	0	499	4	0	7	5
Future Vol, veh/h	0	6	101	0	499	4	0	7	5
Peak Hour Factor	0.92	0.91	0.91	0.92	0.91	0.91	0.92	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	7	111	0	548	4	0	8	5
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8.3	13.5	8.3
HCM LOS	A	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	0%	58%
Vol Thru, %	94%	99%	0%
Vol Right, %	0%	1%	42%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	107	503	12
LT Vol	6	0	7
Through Vol	101	499	0
RT Vol	0	4	5
Lane Flow Rate	118	553	13
Geometry Grp	1	1	1
Degree of Util (X)	0.147	0.62	0.019
Departure Headway (Hd)	4.502	4.041	5.229
Convergence, Y/N	Yes	Yes	Yes
Cap	801	890	688
Service Time	2.504	2.09	3.235
HCM Lane V/C Ratio	0.147	0.621	0.019
HCM Control Delay	8.3	13.5	8.3
HCM Lane LOS	A	B	A
HCM 95th-tile Q	0.5	4.4	0.1

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	32	1	0	12	17	396
Future Vol, veh/h	32	1	0	12	17	396
Conflicting Peds, #/hr	10	10	20	0	0	20
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	1	0	14	20	471

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	280	286	502	0	-	0
Stage 1	266	-	-	-	-	-
Stage 2	14	-	-	-	-	-
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	710	753	1062	-	-	-
Stage 1	779	-	-	-	-	-
Stage 2	1009	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	697	732	1042	-	-	-
Mov Cap-2 Maneuver	697	-	-	-	-	-
Stage 1	772	-	-	-	-	-
Stage 2	999	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1042	-	698	-	-
HCM Lane V/C Ratio	-	-	0.056	-	-
HCM Control Delay (s)	0	-	10.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Intersection Delay, s/veh	12.8
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	89	78	5	0	6	54	204	0	0	15	29
Future Vol, veh/h	0	89	78	5	0	6	54	204	0	0	15	29
Peak Hour Factor	0.92	0.86	0.86	0.86	0.92	0.86	0.86	0.86	0.92	0.86	0.86	0.86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	103	91	6	0	7	63	237	0	0	17	34
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	1
HCM Control Delay	11.4	11.8	9.2
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	0%	52%	2%	88%	0%
Vol Thru, %	34%	45%	20%	12%	0%
Vol Right, %	66%	3%	77%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	44	172	264	256	42
LT Vol	0	89	6	225	0
Through Vol	15	78	54	31	0
RT Vol	29	5	204	0	42
Lane Flow Rate	51	200	307	298	49
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.081	0.316	0.427	0.53	0.071
Departure Headway (Hd)	5.672	5.692	5.013	6.404	5.25
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	629	630	715	563	682
Service Time	3.728	3.739	3.057	4.14	2.985
HCM Lane V/C Ratio	0.081	0.317	0.429	0.529	0.072
HCM Control Delay	9.2	11.4	11.8	16.2	8.4
HCM Lane LOS	A	B	B	C	A
HCM 95th-tile Q	0.3	1.4	2.1	3.1	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	225	31	42
Future Vol, veh/h	0	225	31	42
Peak Hour Factor	0.92	0.86	0.86	0.86
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	262	36	49
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	15.1
HCM LOS	C

Lane

Intersection	
Intersection Delay, s/veh	16
Intersection LOS	C

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	283	49	0	113	170	0	94	232
Future Vol, veh/h	0	283	49	0	113	170	0	94	232
Peak Hour Factor	0.92	0.85	0.85	0.92	0.85	0.85	0.92	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	333	58	0	133	200	0	111	273
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	16.5	15.2	16.1
HCM LOS	C	C	C

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	29%	0%	40%
Vol Thru, %	0%	85%	60%
Vol Right, %	71%	15%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	326	332	283
LT Vol	94	0	113
Through Vol	0	283	170
RT Vol	232	49	0
Lane Flow Rate	384	391	333
Geometry Grp	1	1	1
Degree of Util (X)	0.585	0.598	0.532
Departure Headway (Hd)	5.489	5.515	5.755
Convergence, Y/N	Yes	Yes	Yes
Cap	656	652	623
Service Time	3.548	3.574	3.817
HCM Lane V/C Ratio	0.585	0.6	0.535
HCM Control Delay	16.1	16.5	15.2
HCM Lane LOS	C	C	C
HCM 95th-tile Q	3.8	4	3.1

Intersection	
Intersection Delay, s/veh	16.6
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Traffic Vol, veh/h	0	6	509	0	275	15	0	8	8
Future Vol, veh/h	0	6	509	0	275	15	0	8	8
Peak Hour Factor	0.92	0.82	0.82	0.92	0.82	0.82	0.92	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	7	621	0	335	18	0	10	10
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	19.8	11.3	9
HCM LOS	C	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	0%	50%
Vol Thru, %	99%	95%	0%
Vol Right, %	0%	5%	50%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	515	290	16
LT Vol	6	0	8
Through Vol	509	275	0
RT Vol	0	15	8
Lane Flow Rate	628	354	20
Geometry Grp	1	1	1
Degree of Util (X)	0.76	0.45	0.031
Departure Headway (Hd)	4.359	4.584	5.801
Convergence, Y/N	Yes	Yes	Yes
Cap	829	785	615
Service Time	2.378	2.607	3.86
HCM Lane V/C Ratio	0.758	0.451	0.033
HCM Control Delay	19.8	11.3	9
HCM Lane LOS	C	B	A
HCM 95th-tile Q	7.3	2.4	0.1

Intersection	
Int Delay, s/veh	9.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	320	1	0	6	7	155
Future Vol, veh/h	320	1	0	6	7	155
Conflicting Peds, #/hr	20	20	33	0	0	33
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	451	1	0	8	10	218

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	147	172	248	0	-	0
Stage 1	139	-	-	-	-	-
Stage 2	8	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	845	872	1318	-	-	-
Stage 1	888	-	-	-	-	-
Stage 2	1015	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	813	829	1277	-	-	-
Mov Cap-2 Maneuver	813	-	-	-	-	-
Stage 1	871	-	-	-	-	-
Stage 2	996	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1277	-	813	-	-
HCM Lane V/C Ratio	-	-	0.556	-	-
HCM Control Delay (s)	0	-	14.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	3.5	-	-

APPENDIX F

YEAR 2020 INTERSECTION ANALYSIS CALCULATION WORKSHEETS

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	18	20	1	0	15	62	185	0	1	4	10
Future Vol, veh/h	0	18	20	1	0	15	62	185	0	1	4	10
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	20	22	1	0	16	68	203	0	1	4	11
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	1
HCM Control Delay	8.4	9.5	7.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	7%	46%	6%	81%	0%
Vol Thru, %	27%	51%	24%	19%	0%
Vol Right, %	67%	3%	71%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	39	262	154	74
LT Vol	1	18	15	124	0
Through Vol	4	20	62	30	0
RT Vol	10	1	185	0	74
Lane Flow Rate	16	43	288	169	81
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.022	0.06	0.34	0.267	0.103
Departure Headway (Hd)	4.708	5.012	4.257	5.682	4.572
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	755	713	846	631	780
Service Time	2.769	3.055	2.281	3.432	2.322
HCM Lane V/C Ratio	0.021	0.06	0.34	0.268	0.104
HCM Control Delay	7.9	8.4	9.5	10.5	7.9
HCM Lane LOS	A	A	A	B	A
HCM 95th-tile Q	0.1	0.2	1.5	1.1	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	124	30	74
Future Vol, veh/h	0	124	30	74
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	136	33	81
Number of Lanes	0	0	1	1

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

Lane

Intersection	
Intersection Delay, s/veh	10
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	47	85	22	0	19	247	122	0	9	1	18	0	1	1	6
Future Vol, veh/h	0	47	85	22	0	19	247	122	0	9	1	18	0	1	1	6
Peak Hour Factor	0.92	0.89	0.89	0.89	0.92	0.89	0.89	0.89	0.92	0.89	0.89	0.89	0.92	0.89	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	53	96	25	0	21	278	137	0	10	1	20	0	1	1	7
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.6	10.7	8.1	7.9
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	32%	31%	5%	12%
Vol Thru, %	4%	55%	64%	12%
Vol Right, %	64%	14%	31%	75%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	28	154	388	8
LT Vol	9	47	19	1
Through Vol	1	85	247	1
RT Vol	18	22	122	6
Lane Flow Rate	31	173	436	9
Geometry Grp	1	1	1	1
Degree of Util (X)	0.043	0.212	0.479	0.012
Departure Headway (Hd)	4.899	4.421	3.956	4.831
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	734	815	898	744
Service Time	2.908	2.427	2.044	2.841
HCM Lane V/C Ratio	0.042	0.212	0.486	0.012
HCM Control Delay	8.1	8.6	10.7	7.9
HCM Lane LOS	A	A	B	A
HCM 95th-tile Q	0.1	0.8	2.6	0

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Traffic Vol, veh/h	0	7	97	0	382	4	0	8	6
Future Vol, veh/h	0	7	97	0	382	4	0	8	6
Peak Hour Factor	0.92	0.91	0.91	0.92	0.91	0.91	0.92	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	8	107	0	420	4	0	9	7
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8.1	10.7	8
HCM LOS	A	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	0%	57%
Vol Thru, %	93%	99%	0%
Vol Right, %	0%	1%	43%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	104	386	14
LT Vol	7	0	8
Through Vol	97	382	0
RT Vol	0	4	6
Lane Flow Rate	114	424	15
Geometry Grp	1	1	1
Degree of Util (X)	0.136	0.476	0.021
Departure Headway (Hd)	4.291	4.041	4.941
Convergence, Y/N	Yes	Yes	Yes
Cap	822	887	729
Service Time	2.39	2.084	2.941
HCM Lane V/C Ratio	0.139	0.478	0.021
HCM Control Delay	8.1	10.7	8
HCM Lane LOS	A	B	A
HCM 95th-tile Q	0.5	2.6	0.1

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	14	1	0	14	19	23
Future Vol, veh/h	14	1	0	14	19	23
Conflicting Peds, #/hr	10	10	20	0	0	20
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	1	0	17	23	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	63	66	60	0	-	0
Stage 1	46	-	-	-	-	-
Stage 2	17	-	-	-	-	-
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	943	998	1544	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	1006	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	925	970	1515	-	-	-
Mov Cap-2 Maneuver	925	-	-	-	-	-
Stage 1	967	-	-	-	-	-
Stage 2	996	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1515	-	928	-	-
HCM Lane V/C Ratio	-	-	0.019	-	-
HCM Control Delay (s)	0	-	9	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Intersection Delay, s/veh	12.9
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	98	88	6	0	7	60	166	0	0	17	32
Future Vol, veh/h	0	98	88	6	0	7	60	166	0	0	17	32
Peak Hour Factor	0.92	0.86	0.86	0.86	0.92	0.86	0.86	0.86	0.92	0.86	0.86	0.86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	114	102	7	0	8	70	193	0	0	20	37
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	1
HCM Control Delay	11.8	11.4	9.3
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	0%	51%	3%	87%	0%
Vol Thru, %	35%	46%	26%	13%	0%
Vol Right, %	65%	3%	71%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	49	192	233	261	46
LT Vol	0	98	7	227	0
Through Vol	17	88	60	34	0
RT Vol	32	6	166	0	46
Lane Flow Rate	57	223	271	303	53
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.09	0.353	0.386	0.54	0.078
Departure Headway (Hd)	5.682	5.685	5.134	6.4	5.25
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	628	632	699	564	682
Service Time	3.739	3.732	3.181	4.136	2.986
HCM Lane V/C Ratio	0.091	0.353	0.388	0.537	0.078
HCM Control Delay	9.3	11.8	11.4	16.4	8.4
HCM Lane LOS	A	B	B	C	A
HCM 95th-tile Q	0.3	1.6	1.8	3.2	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	227	34	46
Future Vol, veh/h	0	227	34	46
Peak Hour Factor	0.92	0.86	0.86	0.86
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	264	40	53
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	15.2
HCM LOS	C

Lane

Intersection	
Intersection Delay, s/veh	11.8
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	28	313	6	0	12	187	43	0	6	6	26	0	70	7	40
Future Vol, veh/h	0	28	313	6	0	12	187	43	0	6	6	26	0	70	7	40
Peak Hour Factor	0.92	0.85	0.85	0.85	0.92	0.85	0.85	0.85	0.92	0.85	0.85	0.85	0.92	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	33	368	7	0	14	220	51	0	7	7	31	0	82	8	47
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	13.4	10.9	8.9	10.1
HCM LOS	B	B	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	16%	8%	5%	60%
Vol Thru, %	16%	90%	77%	6%
Vol Right, %	68%	2%	18%	34%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	38	347	242	117
LT Vol	6	28	12	70
Through Vol	6	313	187	7
RT Vol	26	6	43	40
Lane Flow Rate	45	408	285	138
Geometry Grp	1	1	1	1
Degree of Util (X)	0.068	0.54	0.38	0.214
Departure Headway (Hd)	5.511	4.766	4.809	5.605
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	653	747	737	644
Service Time	3.516	2.851	2.903	3.607
HCM Lane V/C Ratio	0.069	0.546	0.387	0.214
HCM Control Delay	8.9	13.4	10.9	10.1
HCM Lane LOS	A	B	B	B
HCM 95th-tile Q	0.2	3.3	1.8	0.8

Intersection	
Intersection Delay, s/veh	12.1
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Traffic Vol, veh/h	0	7	402	0	233	17	0	9	9
Future Vol, veh/h	0	7	402	0	233	17	0	9	9
Peak Hour Factor	0.92	0.82	0.82	0.92	0.82	0.82	0.92	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	9	490	0	284	21	0	11	11
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	13.5	10.1	8.7
HCM LOS	B	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	2%	0%	50%
Vol Thru, %	98%	93%	0%
Vol Right, %	0%	7%	50%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	409	250	18
LT Vol	7	0	9
Through Vol	402	233	0
RT Vol	0	17	9
Lane Flow Rate	499	305	22
Geometry Grp	1	1	1
Degree of Util (X)	0.597	0.377	0.033
Departure Headway (Hd)	4.307	4.447	5.438
Convergence, Y/N	Yes	Yes	Yes
Cap	838	811	657
Service Time	2.322	2.464	3.48
HCM Lane V/C Ratio	0.595	0.376	0.033
HCM Control Delay	13.5	10.1	8.7
HCM Lane LOS	B	B	A
HCM 95th-tile Q	4.1	1.8	0.1

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	31	1	0	7	8	17
Future Vol, veh/h	31	1	0	7	8	17
Conflicting Peds, #/hr	20	20	33	0	0	33
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	44	1	0	10	11	24

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	53	76	55	0	-	0
Stage 1	43	-	-	-	-	-
Stage 2	10	-	-	-	-	-
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	955	985	1550	-	-	-
Stage 1	979	-	-	-	-	-
Stage 2	1013	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	919	936	1501	-	-	-
Mov Cap-2 Maneuver	919	-	-	-	-	-
Stage 1	960	-	-	-	-	-
Stage 2	994	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1501	-	920	-	-
HCM Lane V/C Ratio	-	-	0.049	-	-
HCM Control Delay (s)	0	-	9.1	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

APPENDIX G

YEAR 2020 + PROJECT INTERSECTION ANALYSIS CALCULATION WORKSHEETS

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	18	20	1	0	15	62	185	0	1	4	10
Future Vol, veh/h	0	18	20	1	0	15	62	185	0	1	4	10
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	20	22	1	0	16	68	203	0	1	4	11
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	1
HCM Control Delay	8.6	10	8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	7%	46%	6%	86%	0%
Vol Thru, %	27%	51%	24%	14%	0%
Vol Right, %	67%	3%	71%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	39	262	220	74
LT Vol	1	18	15	190	0
Through Vol	4	20	62	30	0
RT Vol	10	1	185	0	74
Lane Flow Rate	16	43	288	242	81
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.022	0.062	0.356	0.385	0.104
Departure Headway (Hd)	4.834	5.236	4.457	5.734	4.594
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	733	681	806	624	774
Service Time	2.916	3.294	2.49	3.496	2.356
HCM Lane V/C Ratio	0.022	0.063	0.357	0.388	0.105
HCM Control Delay	8	8.6	10	12.1	7.9
HCM Lane LOS	A	A	A	B	A
HCM 95th-tile Q	0.1	0.2	1.6	1.8	0.3

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	190	30	74
Future Vol, veh/h	0	190	30	74
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	209	33	81
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	11
HCM LOS	B

Lane

Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	92	33	0	282	247	0	15	25
Future Vol, veh/h	0	92	33	0	282	247	0	15	25
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.92	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	103	37	0	317	278	0	17	28
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.5	16.7	8.6
HCM LOS	A	C	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	38%	0%	53%
Vol Thru, %	0%	74%	47%
Vol Right, %	62%	26%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	40	125	529
LT Vol	15	0	282
Through Vol	0	92	247
RT Vol	25	33	0
Lane Flow Rate	45	140	594
Geometry Grp	1	1	1
Degree of Util (X)	0.065	0.175	0.698
Departure Headway (Hd)	5.242	4.494	4.226
Convergence, Y/N	Yes	Yes	Yes
Cap	686	802	844
Service Time	3.252	2.503	2.32
HCM Lane V/C Ratio	0.066	0.175	0.704
HCM Control Delay	8.6	8.5	16.7
HCM Lane LOS	A	A	C
HCM 95th-tile Q	0.2	0.6	5.8

Intersection	
Intersection Delay, s/veh	13.3
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Traffic Vol, veh/h	0	7	110	0	523	4	0	8	6
Future Vol, veh/h	0	7	110	0	523	4	0	8	6
Peak Hour Factor	0.92	0.91	0.91	0.92	0.91	0.91	0.92	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	8	121	0	575	4	0	9	7
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8.4	14.5	8.4
HCM LOS	A	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	0%	57%
Vol Thru, %	94%	99%	0%
Vol Right, %	0%	1%	43%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	117	527	14
LT Vol	7	0	8
Through Vol	110	523	0
RT Vol	0	4	6
Lane Flow Rate	129	579	15
Geometry Grp	1	1	1
Degree of Util (X)	0.162	0.652	0.023
Departure Headway (Hd)	4.536	4.053	5.3
Convergence, Y/N	Yes	Yes	Yes
Cap	795	886	679
Service Time	2.541	2.111	3.307
HCM Lane V/C Ratio	0.162	0.653	0.022
HCM Control Delay	8.4	14.5	8.4
HCM Lane LOS	A	B	A
HCM 95th-tile Q	0.6	5	0.1

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	13	1	1	14	19	22
Future Vol, veh/h	13	1	1	14	19	22
Conflicting Peds, #/hr	10	10	20	0	0	20
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	1	1	17	23	26

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	65	66	59	0	-	0
Stage 1	46	-	-	-	-	-
Stage 2	19	-	-	-	-	-
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	941	998	1545	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	1004	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	922	970	1516	-	-	-
Mov Cap-2 Maneuver	922	-	-	-	-	-
Stage 1	967	-	-	-	-	-
Stage 2	993	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1516	-	925	-	-
HCM Lane V/C Ratio	0.001	-	0.018	-	-
HCM Control Delay (s)	7.4	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Intersection Delay, s/veh	14.1
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	98	88	6	0	7	60	215	0	1	17	32
Future Vol, veh/h	0	98	88	6	0	7	60	215	0	1	17	32
Peak Hour Factor	0.92	0.86	0.86	0.86	0.92	0.86	0.86	0.86	0.92	0.86	0.86	0.86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	114	102	7	0	8	70	250	0	1	20	37
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	1
HCM Control Delay	12.3	12.9	9.7
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	2%	51%	2%	88%	0%
Vol Thru, %	34%	46%	21%	12%	0%
Vol Right, %	64%	3%	76%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	50	192	282	277	46
LT Vol	1	98	7	243	0
Through Vol	17	88	60	34	0
RT Vol	32	6	215	0	46
Lane Flow Rate	58	223	328	322	53
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.096	0.365	0.475	0.589	0.081
Departure Headway (Hd)	5.955	5.886	5.213	6.58	5.424
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	598	609	689	548	658
Service Time	4.034	3.949	3.271	4.329	3.172
HCM Lane V/C Ratio	0.097	0.366	0.476	0.588	0.081
HCM Control Delay	9.7	12.3	12.9	18.4	8.7
HCM Lane LOS	A	B	B	C	A
HCM 95th-tile Q	0.3	1.7	2.6	3.8	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	243	34	46
Future Vol, veh/h	0	243	34	46
Peak Hour Factor	0.92	0.86	0.86	0.86
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	283	40	53
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	17
HCM LOS	C

Lane

Intersection	
Intersection Delay, s/veh	19
Intersection LOS	C

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	461	10	0	114	187	0	95	86
Future Vol, veh/h	0	461	10	0	114	187	0	95	86
Peak Hour Factor	0.92	0.85	0.85	0.92	0.85	0.85	0.92	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	542	12	0	134	220	0	112	101
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	24.4	14.6	12.3
HCM LOS	C	B	B

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	52%	0%	38%
Vol Thru, %	0%	98%	62%
Vol Right, %	48%	2%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	181	471	301
LT Vol	95	0	114
Through Vol	0	461	187
RT Vol	86	10	0
Lane Flow Rate	213	554	354
Geometry Grp	1	1	1
Degree of Util (X)	0.355	0.787	0.536
Departure Headway (Hd)	5.995	5.112	5.444
Convergence, Y/N	Yes	Yes	Yes
Cap	598	709	662
Service Time	4.046	3.149	3.486
HCM Lane V/C Ratio	0.356	0.781	0.535
HCM Control Delay	12.3	24.4	14.6
HCM Lane LOS	B	C	B
HCM 95th-tile Q	1.6	7.8	3.2

Intersection	
Intersection Delay, s/veh	19.2
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Traffic Vol, veh/h	0	7	540	0	292	17	0	9	9
Future Vol, veh/h	0	7	540	0	292	17	0	9	9
Peak Hour Factor	0.92	0.82	0.82	0.92	0.82	0.82	0.92	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	9	659	0	356	21	0	11	11
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	23.6	12	9.2
HCM LOS	C	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	0%	50%
Vol Thru, %	99%	94%	0%
Vol Right, %	0%	6%	50%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	547	309	18
LT Vol	7	0	9
Through Vol	540	292	0
RT Vol	0	17	9
Lane Flow Rate	667	377	22
Geometry Grp	1	1	1
Degree of Util (X)	0.814	0.485	0.036
Departure Headway (Hd)	4.395	4.634	5.929
Convergence, Y/N	Yes	Yes	Yes
Cap	827	776	601
Service Time	2.419	2.662	3.998
HCM Lane V/C Ratio	0.807	0.486	0.037
HCM Control Delay	23.6	12	9.2
HCM Lane LOS	C	B	A
HCM 95th-tile Q	8.9	2.7	0.1

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	25	1	1	7	8	10
Future Vol, veh/h	25	1	1	7	8	10
Conflicting Peds, #/hr	20	20	33	0	0	33
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	1	1	10	11	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	51	71	45	0	-	0
Stage 1	38	-	-	-	-	-
Stage 2	13	-	-	-	-	-
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	958	991	1563	-	-	-
Stage 1	984	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	921	942	1514	-	-	-
Mov Cap-2 Maneuver	921	-	-	-	-	-
Stage 1	965	-	-	-	-	-
Stage 2	990	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1514	-	922	-	-
HCM Lane V/C Ratio	0.001	-	0.04	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	18	20	1	0	15	62	185	0	1	4	10
Future Vol, veh/h	0	18	20	1	0	15	62	185	0	1	4	10
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	20	22	1	0	16	68	203	0	1	4	11
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	1
HCM Control Delay	8.6	10	8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	7%	46%	6%	86%	0%
Vol Thru, %	27%	51%	24%	14%	0%
Vol Right, %	67%	3%	71%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	39	262	220	74
LT Vol	1	18	15	190	0
Through Vol	4	20	62	30	0
RT Vol	10	1	185	0	74
Lane Flow Rate	16	43	288	242	81
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.022	0.062	0.356	0.385	0.104
Departure Headway (Hd)	4.834	5.236	4.457	5.734	4.594
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	733	681	806	624	774
Service Time	2.916	3.294	2.49	3.496	2.356
HCM Lane V/C Ratio	0.022	0.063	0.357	0.388	0.105
HCM Control Delay	8	8.6	10	12.1	7.9
HCM Lane LOS	A	A	A	B	A
HCM 95th-tile Q	0.1	0.2	1.6	1.8	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	190	30	74
Future Vol, veh/h	0	190	30	74
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	209	33	81
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	11
HCM LOS	B

Lane

Intersection	
Intersection Delay, s/veh	14.7
Intersection LOS	B

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	85	33	0	282	247	0	15	32
Future Vol, veh/h	0	85	33	0	282	247	0	15	32
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.92	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	96	37	0	317	278	0	17	36
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.4	16.7	8.6
HCM LOS	A	C	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	32%	0%	53%
Vol Thru, %	0%	72%	47%
Vol Right, %	68%	28%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	47	118	529
LT Vol	15	0	282
Through Vol	0	85	247
RT Vol	32	33	0
Lane Flow Rate	53	133	594
Geometry Grp	1	1	1
Degree of Util (X)	0.076	0.166	0.699
Departure Headway (Hd)	5.185	4.506	4.334
Convergence, Y/N	Yes	Yes	Yes
Cap	694	798	838
Service Time	3.195	2.52	2.334
HCM Lane V/C Ratio	0.076	0.167	0.709
HCM Control Delay	8.6	8.4	16.7
HCM Lane LOS	A	A	C
HCM 95th-tile Q	0.2	0.6	5.9

Intersection	
Intersection Delay, s/veh	13.3
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Traffic Vol, veh/h	0	7	110	0	523	4	0	8	6
Future Vol, veh/h	0	7	110	0	523	4	0	8	6
Peak Hour Factor	0.92	0.91	0.91	0.92	0.91	0.91	0.92	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	8	121	0	575	4	0	9	7
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8.4	14.5	8.4
HCM LOS	A	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	0%	57%
Vol Thru, %	94%	99%	0%
Vol Right, %	0%	1%	43%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	117	527	14
LT Vol	7	0	8
Through Vol	110	523	0
RT Vol	0	4	6
Lane Flow Rate	129	579	15
Geometry Grp	1	1	1
Degree of Util (X)	0.162	0.652	0.023
Departure Headway (Hd)	4.536	4.053	5.3
Convergence, Y/N	Yes	Yes	Yes
Cap	795	886	679
Service Time	2.541	2.111	3.307
HCM Lane V/C Ratio	0.162	0.653	0.022
HCM Control Delay	8.4	14.5	8.4
HCM Lane LOS	A	B	A
HCM 95th-tile Q	0.6	5	0.1

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	33	1	1	14	19	296
Future Vol, veh/h	33	1	1	14	19	296
Conflicting Peds, #/hr	10	10	20	0	0	20
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	1	1	17	23	352

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	228	229	385	0	-	0
Stage 1	209	-	-	-	-	-
Stage 2	19	-	-	-	-	-
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	760	810	1173	-	-	-
Stage 1	826	-	-	-	-	-
Stage 2	1004	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	745	787	1151	-	-	-
Mov Cap-2 Maneuver	745	-	-	-	-	-
Stage 1	818	-	-	-	-	-
Stage 2	993	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1151	-	746	-	-
HCM Lane V/C Ratio	0.001	-	0.054	-	-
HCM Control Delay (s)	8.1	0	10.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Intersection Delay, s/veh	14.1
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	98	88	6	0	7	60	215	0	1	17	32
Future Vol, veh/h	0	98	88	6	0	7	60	215	0	1	17	32
Peak Hour Factor	0.92	0.86	0.86	0.86	0.92	0.86	0.86	0.86	0.92	0.86	0.86	0.86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	114	102	7	0	8	70	250	0	1	20	37
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	1
HCM Control Delay	12.3	12.9	9.7
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	2%	51%	2%	88%	0%
Vol Thru, %	34%	46%	21%	12%	0%
Vol Right, %	64%	3%	76%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	50	192	282	277	46
LT Vol	1	98	7	243	0
Through Vol	17	88	60	34	0
RT Vol	32	6	215	0	46
Lane Flow Rate	58	223	328	322	53
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.096	0.365	0.475	0.589	0.081
Departure Headway (Hd)	5.955	5.886	5.213	6.58	5.424
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	598	609	689	548	658
Service Time	4.034	3.949	3.271	4.329	3.172
HCM Lane V/C Ratio	0.097	0.366	0.476	0.588	0.081
HCM Control Delay	9.7	12.3	12.9	18.4	8.7
HCM Lane LOS	A	B	B	C	A
HCM 95th-tile Q	0.3	1.7	2.6	3.8	0.3

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	243	34	46
Future Vol, veh/h	0	243	34	46
Peak Hour Factor	0.92	0.86	0.86	0.86
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	283	40	53
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	17
HCM LOS	C

Lane

Intersection	
Intersection Delay, s/veh	16.5
Intersection LOS	C

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	313	10	0	114	187	0	95	234
Future Vol, veh/h	0	313	10	0	114	187	0	95	234
Peak Hour Factor	0.92	0.85	0.85	0.92	0.85	0.85	0.92	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	368	12	0	134	220	0	112	275
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	16.8	16.2	16.5
HCM LOS	C	C	C

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	29%	0%	38%
Vol Thru, %	0%	97%	62%
Vol Right, %	71%	3%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	329	323	301
LT Vol	95	0	114
Through Vol	0	313	187
RT Vol	234	10	0
Lane Flow Rate	387	380	354
Geometry Grp	1	1	1
Degree of Util (X)	0.595	0.596	0.567
Departure Headway (Hd)	5.535	5.642	5.768
Convergence, Y/N	Yes	Yes	Yes
Cap	650	638	623
Service Time	3.599	3.705	3.833
HCM Lane V/C Ratio	0.595	0.596	0.568
HCM Control Delay	16.5	16.8	16.2
HCM Lane LOS	C	C	C
HCM 95th-tile Q	3.9	3.9	3.6

Intersection	
Intersection Delay, s/veh	19.2
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Traffic Vol, veh/h	0	7	540	0	292	17	0	9	9
Future Vol, veh/h	0	7	540	0	292	17	0	9	9
Peak Hour Factor	0.92	0.82	0.82	0.92	0.82	0.82	0.92	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	9	659	0	356	21	0	11	11
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	23.6	12	9.2
HCM LOS	C	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	0%	50%
Vol Thru, %	99%	94%	0%
Vol Right, %	0%	6%	50%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	547	309	18
LT Vol	7	0	9
Through Vol	540	292	0
RT Vol	0	17	9
Lane Flow Rate	667	377	22
Geometry Grp	1	1	1
Degree of Util (X)	0.814	0.485	0.036
Departure Headway (Hd)	4.395	4.634	5.929
Convergence, Y/N	Yes	Yes	Yes
Cap	827	776	601
Service Time	2.419	2.662	3.998
HCM Lane V/C Ratio	0.807	0.486	0.037
HCM Control Delay	23.6	12	9.2
HCM Lane LOS	C	B	A
HCM 95th-tile Q	8.9	2.7	0.1

Intersection	
Int Delay, s/veh	10.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	322	1	1	7	8	116
Future Vol, veh/h	322	1	1	7	8	116
Conflicting Peds, #/hr	20	20	33	0	0	33
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	454	1	1	10	11	163

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	126	146	195	0	-	0
Stage 1	113	-	-	-	-	-
Stage 2	13	-	-	-	-	-
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	869	901	1378	-	-	-
Stage 1	912	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	835	856	1335	-	-	-
Mov Cap-2 Maneuver	835	-	-	-	-	-
Stage 1	895	-	-	-	-	-
Stage 2	990	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.3	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1335	-	835	-	-
HCM Lane V/C Ratio	0.001	-	0.545	-	-
HCM Control Delay (s)	7.7	0	14.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	3.4	-	-

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	18	20	1	0	15	62	185	0	1	4	10
Future Vol, veh/h	0	18	20	1	0	15	62	185	0	1	4	10
Peak Hour Factor	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	20	22	1	0	16	68	203	0	1	4	11
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	1
HCM Control Delay	8.6	10	8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	7%	46%	6%	86%	0%
Vol Thru, %	27%	51%	24%	14%	0%
Vol Right, %	67%	3%	71%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	39	262	220	74
LT Vol	1	18	15	190	0
Through Vol	4	20	62	30	0
RT Vol	10	1	185	0	74
Lane Flow Rate	16	43	288	242	81
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.022	0.062	0.356	0.385	0.104
Departure Headway (Hd)	4.834	5.236	4.457	5.734	4.594
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	733	681	806	624	774
Service Time	2.916	3.294	2.49	3.496	2.356
HCM Lane V/C Ratio	0.022	0.063	0.357	0.388	0.105
HCM Control Delay	8	8.6	10	12.1	7.9
HCM Lane LOS	A	A	A	B	A
HCM 95th-tile Q	0.1	0.2	1.6	1.8	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	190	30	74
Future Vol, veh/h	0	190	30	74
Peak Hour Factor	0.92	0.91	0.91	0.91
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	209	33	81
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	11
HCM LOS	B

Lane

Intersection	
Intersection Delay, s/veh	15.4
Intersection LOS	C

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	85	135	0	282	247	0	15	32
Future Vol, veh/h	0	85	135	0	282	247	0	15	32
Peak Hour Factor	0.92	0.89	0.89	0.92	0.89	0.89	0.92	0.89	0.89
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	96	152	0	317	278	0	17	36
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.2	18.5	8.9
HCM LOS	A	C	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	32%	0%	53%
Vol Thru, %	0%	39%	47%
Vol Right, %	68%	61%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	47	220	529
LT Vol	15	0	282
Through Vol	0	85	247
RT Vol	32	135	0
Lane Flow Rate	53	247	594
Geometry Grp	1	1	1
Degree of Util (X)	0.079	0.297	0.731
Departure Headway (Hd)	5.39	4.323	4.429
Convergence, Y/N	Yes	Yes	Yes
Cap	662	831	814
Service Time	3.444	2.352	2.454
HCM Lane V/C Ratio	0.08	0.297	0.73
HCM Control Delay	8.9	9.2	18.5
HCM Lane LOS	A	A	C
HCM 95th-tile Q	0.3	1.2	6.6

Intersection	
Intersection Delay, s/veh	13.3
Intersection LOS	B

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Traffic Vol, veh/h	0	7	110	0	523	4	0	8	6
Future Vol, veh/h	0	7	110	0	523	4	0	8	6
Peak Hour Factor	0.92	0.91	0.91	0.92	0.91	0.91	0.92	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	8	121	0	575	4	0	9	7
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8.4	14.5	8.4
HCM LOS	A	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	6%	0%	57%
Vol Thru, %	94%	99%	0%
Vol Right, %	0%	1%	43%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	117	527	14
LT Vol	7	0	8
Through Vol	110	523	0
RT Vol	0	4	6
Lane Flow Rate	129	579	15
Geometry Grp	1	1	1
Degree of Util (X)	0.162	0.652	0.023
Departure Headway (Hd)	4.536	4.053	5.3
Convergence, Y/N	Yes	Yes	Yes
Cap	795	886	679
Service Time	2.541	2.111	3.307
HCM Lane V/C Ratio	0.162	0.653	0.022
HCM Control Delay	8.4	14.5	8.4
HCM Lane LOS	A	B	A
HCM 95th-tile Q	0.6	5	0.1

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	33	1	1	14	19	398
Future Vol, veh/h	33	1	1	14	19	398
Conflicting Peds, #/hr	10	10	20	0	0	20
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	1	1	17	23	474

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	289	290	506	0	-	0
Stage 1	270	-	-	-	-	-
Stage 2	19	-	-	-	-	-
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	702	749	1059	-	-	-
Stage 1	775	-	-	-	-	-
Stage 2	1004	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	688	728	1039	-	-	-
Mov Cap-2 Maneuver	688	-	-	-	-	-
Stage 1	768	-	-	-	-	-
Stage 2	993	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.6	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1039	-	689	-	-
HCM Lane V/C Ratio	0.001	-	0.059	-	-
HCM Control Delay (s)	8.5	0	10.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Intersection Delay, s/veh	14.1
Intersection LOS	B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	98	88	6	0	7	60	215	0	1	17	32
Future Vol, veh/h	0	98	88	6	0	7	60	215	0	1	17	32
Peak Hour Factor	0.92	0.86	0.86	0.86	0.92	0.86	0.86	0.86	0.92	0.86	0.86	0.86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	114	102	7	0	8	70	250	0	1	20	37
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	2
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	2	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	2	1
HCM Control Delay	12.3	12.9	9.7
HCM LOS	B	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	2%	51%	2%	88%	0%
Vol Thru, %	34%	46%	21%	12%	0%
Vol Right, %	64%	3%	76%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	50	192	282	277	46
LT Vol	1	98	7	243	0
Through Vol	17	88	60	34	0
RT Vol	32	6	215	0	46
Lane Flow Rate	58	223	328	322	53
Geometry Grp	5	2	2	7	7
Degree of Util (X)	0.096	0.365	0.475	0.589	0.081
Departure Headway (Hd)	5.955	5.886	5.213	6.58	5.424
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	598	609	689	548	658
Service Time	4.034	3.949	3.271	4.329	3.172
HCM Lane V/C Ratio	0.097	0.366	0.476	0.588	0.081
HCM Control Delay	9.7	12.3	12.9	18.4	8.7
HCM Lane LOS	A	B	B	C	A
HCM 95th-tile Q	0.3	1.7	2.6	3.8	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	243	34	46
Future Vol, veh/h	0	243	34	46
Peak Hour Factor	0.92	0.86	0.86	0.86
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	283	40	53
Number of Lanes	0	0	1	1

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	17
HCM LOS	C

Lane

Intersection	
Intersection Delay, s/veh	17.8
Intersection LOS	C

Movement	EBU	EBT	EBR	WBU	WBL	WBT	NBU	NBL	NBR
Traffic Vol, veh/h	0	313	50	0	114	187	0	95	234
Future Vol, veh/h	0	313	50	0	114	187	0	95	234
Peak Hour Factor	0.92	0.85	0.85	0.92	0.85	0.85	0.92	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	368	59	0	134	220	0	112	275
Number of Lanes	0	1	0	0	0	1	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	19.2	16.7	17.2
HCM LOS	C	C	C

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	29%	0%	38%
Vol Thru, %	0%	86%	62%
Vol Right, %	71%	14%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	329	363	301
LT Vol	95	0	114
Through Vol	0	313	187
RT Vol	234	50	0
Lane Flow Rate	387	427	354
Geometry Grp	1	1	1
Degree of Util (X)	0.608	0.665	0.577
Departure Headway (Hd)	5.651	5.609	5.864
Convergence, Y/N	Yes	Yes	Yes
Cap	635	641	613
Service Time	3.722	3.68	3.937
HCM Lane V/C Ratio	0.609	0.666	0.577
HCM Control Delay	17.2	19.2	16.7
HCM Lane LOS	C	C	C
HCM 95th-tile Q	4.1	5	3.7

Intersection	
Intersection Delay, s/veh	19.2
Intersection LOS	C

Movement	EBU	EBL	EBT	WBU	WBT	WBR	SBU	SBL	SBR
Traffic Vol, veh/h	0	7	540	0	292	17	0	9	9
Future Vol, veh/h	0	7	540	0	292	17	0	9	9
Peak Hour Factor	0.92	0.82	0.82	0.92	0.82	0.82	0.92	0.82	0.82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	9	659	0	356	21	0	11	11
Number of Lanes	0	0	1	0	1	0	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	23.6	12	9.2
HCM LOS	C	B	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	1%	0%	50%
Vol Thru, %	99%	94%	0%
Vol Right, %	0%	6%	50%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	547	309	18
LT Vol	7	0	9
Through Vol	540	292	0
RT Vol	0	17	9
Lane Flow Rate	667	377	22
Geometry Grp	1	1	1
Degree of Util (X)	0.814	0.485	0.036
Departure Headway (Hd)	4.395	4.634	5.929
Convergence, Y/N	Yes	Yes	Yes
Cap	827	776	601
Service Time	2.419	2.662	3.998
HCM Lane V/C Ratio	0.807	0.486	0.037
HCM Control Delay	23.6	12	9.2
HCM Lane LOS	C	B	A
HCM 95th-tile Q	8.9	2.7	0.1

Intersection	
Int Delay, s/veh	9.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Traffic Vol, veh/h	322	1	1	7	8	156
Future Vol, veh/h	322	1	1	7	8	156
Conflicting Peds, #/hr	20	20	33	0	0	33
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	454	1	1	10	11	220

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	154	174	251	0	-	0
Stage 1	141	-	-	-	-	-
Stage 2	13	-	-	-	-	-
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	838	869	1314	-	-	-
Stage 1	886	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	806	826	1273	-	-	-
Mov Cap-2 Maneuver	806	-	-	-	-	-
Stage 1	869	-	-	-	-	-
Stage 2	990	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.1	1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1273	-	806	-	-
HCM Lane V/C Ratio	0.001	-	0.564	-	-
HCM Control Delay (s)	7.8	0	15.1	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	3.6	-	-