

# **APPENDIX E**

## **TRANSPORTATION IMPACT ANALYSIS**



HEXAGON TRANSPORTATION CONSULTANTS, INC.

# 1700 Cavallo Road Antioch Rocketship School

## Transportation Impact Analysis

Prepared for:

**Rocketship Education**

August 1, 2017



**Hexagon Transportation Consultants, Inc.**

Hexagon Office: 4 North Second Street, Suite 400

San Jose, CA 95113

Hexagon Job Number: 16MH26

Phone: 408.971.6100

Client Name: Rocketship Education

**San Jose · Gilroy · Pleasanton · Phoenix**

[www.hextrans.com](http://www.hextrans.com)

Areawide Circulation Plans Corridor Studies Pavement Delineation Plans Traffic Handling Plans Impact Fees Interchange Analysis Parking  
Transportation Planning Traffic Calming Traffic Control Plans Traffic Simulation Traffic Impact Analysis Traffic Signal Design Travel Demand Forecasting

## Table of Contents

---

Executive Summary .....	i
1. Introduction .....	1
2. Existing Conditions.....	9
3. Existing Plus Project Conditions.....	19
4. Cumulative Conditions.....	26
5. Other Transportation Issues .....	30
6. Conclusions.....	39

## Appendices

- Appendix A Traffic Counts
- Appendix B Volume Summary
- Appendix C Level of Service Calculations

## List of Tables

Table ES-1 Intersection Level of Service Summary .....	iv
Table 1 Signalized Intersection Level of Service Definitions Based on Control Delay.....	6
Table 2 Unsignalized Intersection Level of Service Definitions Based on Delay.....	7
Table 3 Existing Transit Services .....	12
Table 4 Existing Intersection Levels of Service .....	18
Table 5 Trip Generation Rate Comparison.....	20
Table 6 Project Trip Generation Estimates.....	20
Table 7 Existing Plus Project Intersection Levels of Service.....	25
Table 8 Cumulative Level of Service Summary .....	29
Table 9 Queuing Analysis Summary .....	36

## List of Figures

Figure 1 Site Location and Study Intersections.....	2
Figure 2 Project Site Plan.....	3
Figure 3 Existing Bicycle Facilities.....	11
Figure 4 Existing Transit Services .....	13
Figure 5 Existing Lane Configurations.....	15
Figure 6 Existing Traffic Volumes.....	16
Figure 7 Project Trip Distribution .....	22
Figure 8 Project Trip Assignment .....	23
Figure 9 Existing Plus Project Traffic Volumes .....	24
Figure 10 Cumulative Traffic Volumes.....	27
Figure 11 Cumulative with Project Traffic Volumes.....	28
Figure 12 Project Student Drop-off/Pick-up Circulation.....	32
Figure 13 Recommended Restriping on East 18 <sup>th</sup> Street at Cavallo Road .....	37

## Executive Summary

---

This report presents the results of the traffic impact analysis conducted for the proposed Rocketship School at 1700 Cavallo Road in Antioch, California. The proposed project would replace the existing building with a new 24,357-square foot K-5 charter elementary school with an enrollment of 600 students and 32 full-time staff. Access to the project site would be provided via three on-site driveways, one with full-access and two with partial-access (entry-only and exit-only), as well as a one-way access easement through the adjacent County parcel.

This study was conducted for the purpose of identifying the potential traffic impacts related to the proposed development. The potential impacts of the project were evaluated in accordance with the standards set forth by the City of Antioch and the Contra Costa Transportation Authority (CCTA), which serves as the Congestion Management Agency (CMA) for Contra Costa County. A County Congestion Management Program (CMP) analysis was not required because none of the study intersections are part of the CMP network. However, many of the study area roadways are considered routes of regional significance. The suburban arterial routes within the study area were evaluated in accordance with the East County Action Plan (ECAP). The traffic study includes an analysis of AM and PM peak hour traffic conditions for nine signalized intersections and two unsignalized intersection in the vicinity of the project site.

### Project Trip Generation

The trip generation rates for the proposed school are based on counts Hexagon Transportation Consultants, Inc. conducted at existing Rocketship Schools in San Jose between 2012 and 2014. The trip generation rates at Rocketship Schools in San Jose are significantly higher than the elementary school trip rates published in the Institute of Transportation Engineers' *Trip Generation Manual, 9th Edition*. The magnitude of traffic generated by the proposed school was estimated by multiplying the observed Rocketship School trip generation rates by the proposed enrollment (600 students). Given that the existing building on the site is currently vacant, no credits or reductions were assumed for the trips generated from the previous use.

Based on the surveyed trip generation rates and an enrollment of 600 students, the project would generate 1,650 daily trips, 578 trips (314 inbound and 264 outbound) during the AM peak hour, and 314 trips (128 inbound and 186 outbound) during the PM peak hour.

### Project Impacts

The results of the intersection level of service analysis are shown in Table ES-1. The analysis determined that under all scenarios with and without the project, when measured against the City of

Antioch and ECAP level of service standards, all of the signalized study intersections are expected to operate at acceptable levels (high-level LOS D or better). In addition, under all scenarios with and without the project, the worst stop-controlled approaches at the unsignalized study intersections would operate at LOS C or better during one or both peak hours, which complies with the City's mid-level LOS D standard for intersections not on a Route of Regional Significance. Therefore, the project would not result in a significant impact on intersection levels of service.

### **Other Transportation Issues**

According to the 2013 Contra Costa County CMP *Technical Procedures*, the proposed project would not have an adverse effect on the existing transit, pedestrian, or bicycle facilities in the study area.

Based on a review of the project site plan, Hexagon has provided the following recommendations to improve site access, and on-site circulation.

### **Recommendations**

- The northern parking lot should be reserved for staff parking only, given that there is not sufficient space at the end of the aisle for vehicles to turn around if the lot is full.
- The four 90-degree tandem spaces within the northern parking lot should be converted to standard 90-degree spaces with two spaces accessed via the adjacent county parcel and two spaces accessed via the project driveway.
- During student unloading/loading periods, school staff or volunteers should direct traffic and place cones in the drive aisles while students unload/load. After all students have cleared the loading zone, staff should remove the cones and allow traffic to move again so that the next 10 vehicles can enter the loading zone. Staff members or parent volunteers should be stationed along the length of the student loading zone to assist students in and out of vehicles and ensure they safely walk to the school. Staff or volunteers should also ensure that parents do not leave their vehicles unattended in the loading zone while they visit the school and direct parents to unload/load students in a timely manner and then exit the loading zone. Parents that need additional time, for example to complete a phone call or to communicate with students before leaving the site should be directed to park in the designated on-site parking spaces to ensure the loading zone is available for its intended purpose.
- During the student unloading/loading periods, the entry-only driveway at the southern on-site parking lot should be monitored by staff or volunteers to prevent parents from using the parking area as a student unloading/loading zone and to avoid conflicts with vehicles exiting the designated student loading/unloading zone. Staff and/or traffic cones should be positioned adjacent to the exit gate at the end of the student loading/unloading zone to instruct vehicles to merge into one lane and direct traffic flow toward the exit-only driveway.
- At the Cavallo Road/East 18<sup>th</sup> Street intersection, the additional trips added by the proposed Rocketship School would increase the eastbound 95<sup>th</sup> percentile left-turn queue by 75 feet and 50 feet, or three vehicles and two vehicles, during the AM and PM peak hours, respectively. The increase in queue length would exceed the existing turn pocket storage, possibly causing some left-turn vehicles to queue in the adjacent through lane while waiting to enter the left-turn pocket. Because East 18th Street has two through lanes in each direction, through traffic could continue to proceed in the curb lane if the inner through lane is blocked by left-turn traffic. The queue spillover would have an insignificant effect on traffic operations at this intersection because the spillover would occur for only a few seconds during only some signal cycles during the peak hours before and after school, and the left-turn queue is expected to completely dissipate during

each signal cycle. Furthermore, the intersection would continue to operate at LOS C even if eastbound through traffic were reduced to the use of a single lane for the entire hour. Nevertheless, median striping modifications are recommended to encourage eastbound left-turn queues to extend into the center turn lane if necessary. The modification would remove the left-turn pocket taper striping to increase the queue storage available for use by eastbound left-turn traffic while still accommodating the existing left turns to and from adjacent driveways and Woodland Drive.

**Table ES-1  
Intersection Level of Service Summary**

Study Number	Intersection	Peak Hour	Count Date	Control Type	Existing				Cumulative			
					No Project		with Project		No Project		with Project	
					Avg. Delay	LOS	Avg. Delay	LOS	Avg. Delay	LOS	Avg. Delay	LOS
1	"A" Street and West 9th Street/Wilbur Avenue*	AM	4/6/17	Signal	30.2	C	34.8	C	30.4	C	35.3	D
		PM	4/6/17		35.4	D	36.8	D	38.3	D	40.2	D
2	Cavallo Road and Wilbur Avenue*	AM	4/6/17	Signal	27.9	C	29.1	C	27.9	C	29.1	C
		PM	4/6/17		24.0	C	25.9	C	24.1	C	26.0	C
3	"G" Street and West 10th Street* <sup>2</sup>	AM	2/17/16	Signal	11.5	B	11.9	B	12.4	B	12.9	B
		PM	6/28/17		10.1	B	10.1	B	10.1	B	10.2	B
4	"A" Street and West 10th Street/Beede Way*	AM	4/6/17	Signal	26.7	C	28.0	C	30.9	C	33.2	C
		PM	4/6/17		28.8	C	29.5	C	29.7	C	30.4	C
5	"A" Street and East 13th Street	AM	4/6/17	TWSC <sup>1</sup>	16.1	C	16.6	C	18.9	C	20.7	C
		PM	4/6/17		16.0	C	14.8	B	16.5	C	15.2	C
6	Cavallo Road and East 13th Street	AM	4/6/17	TWSC <sup>1</sup>	10.6	B	12.5	B	10.7	B	12.5	B
		PM	4/6/17		10.3	B	10.8	B	10.3	B	11.0	B
7	"G" Street and West 18th Street* <sup>2</sup>	AM	3/24/16	Signal	20.3	D	21.2	C	22.5	C	23.6	C
		PM	6/28/17		26.1	C	27.0	C	46.7	D	51.2	D
8	"A" Street and East 18th Street* <sup>3</sup>	AM	4/6/17	Signal	40.2	D	42.1	D	40.7	D	42.4	D
		PM	4/6/17		49.2	D	50.2	D	50.0	D	51.1	D
9	Evergreen Avenue and East 18th Street* <sup>3</sup>	AM	4/6/17	Signal	25.0	C	26.1	C	25.2	C	26.2	C
		PM	4/6/17		26.9	C	27.7	C	27.4	C	28.2	C
10	Cavallo Road and East 18th Street*	AM	4/6/17	Signal	22.7	C	26.1	C	22.8	C	26.1	C
		PM	4/6/17		23.3	C	24.6	C	24.2	C	25.5	C
11	Hillcrest Avenue and East 18th Street* <sup>3</sup>	AM	4/6/17	Signal	35.2	D	35.9	D	35.9	C	36.6	D
		PM	4/6/17		39.6	D	40.3	D	40.7	D	41.2	D

Note:  
 TWSC = Two-Way Stop Control  
 \* Denotes an intersection on a Route of Regional Significance  
<sup>1</sup> For TWSC intersections, the worst approach's delay and level of service are reported.  
<sup>2</sup> PM counts were seasonally adjusted to reflect traffic when Antioch schools are in session.  
<sup>3</sup> The *Highway Capacity Manual* (HCM) 2010 does not support turning movements with shared and exclusive lanes. Therefore, this intersection was analyzed using the HCM 2000.  
**Bold** indicates a substandard level of service.  
**Bold** indicates a significant project impact.

# 1. Introduction

---

This report presents the results of the Transportation Impact Analysis (TIA) conducted for the proposed Rocketship School at 1700 Cavallo Road in Antioch, California. The project site is located on the west side of Cavallo Road just north of East 18<sup>th</sup> Street. The existing building on the project site contains approximately 24,900 square feet and is currently vacant. The proposed project would replace the existing building with a new 24,357-square foot K-5 charter elementary school with an enrollment of 600 students and 32 full-time staff. Access to the project site would be provided via three on-site driveways, one full-access and two partial-access (entry-only and exit-only), as well as a one-way access easement through the adjacent County parcel. The project site and the surrounding study area are shown on Figure 1. The proposed site plan is shown on Figure 2.

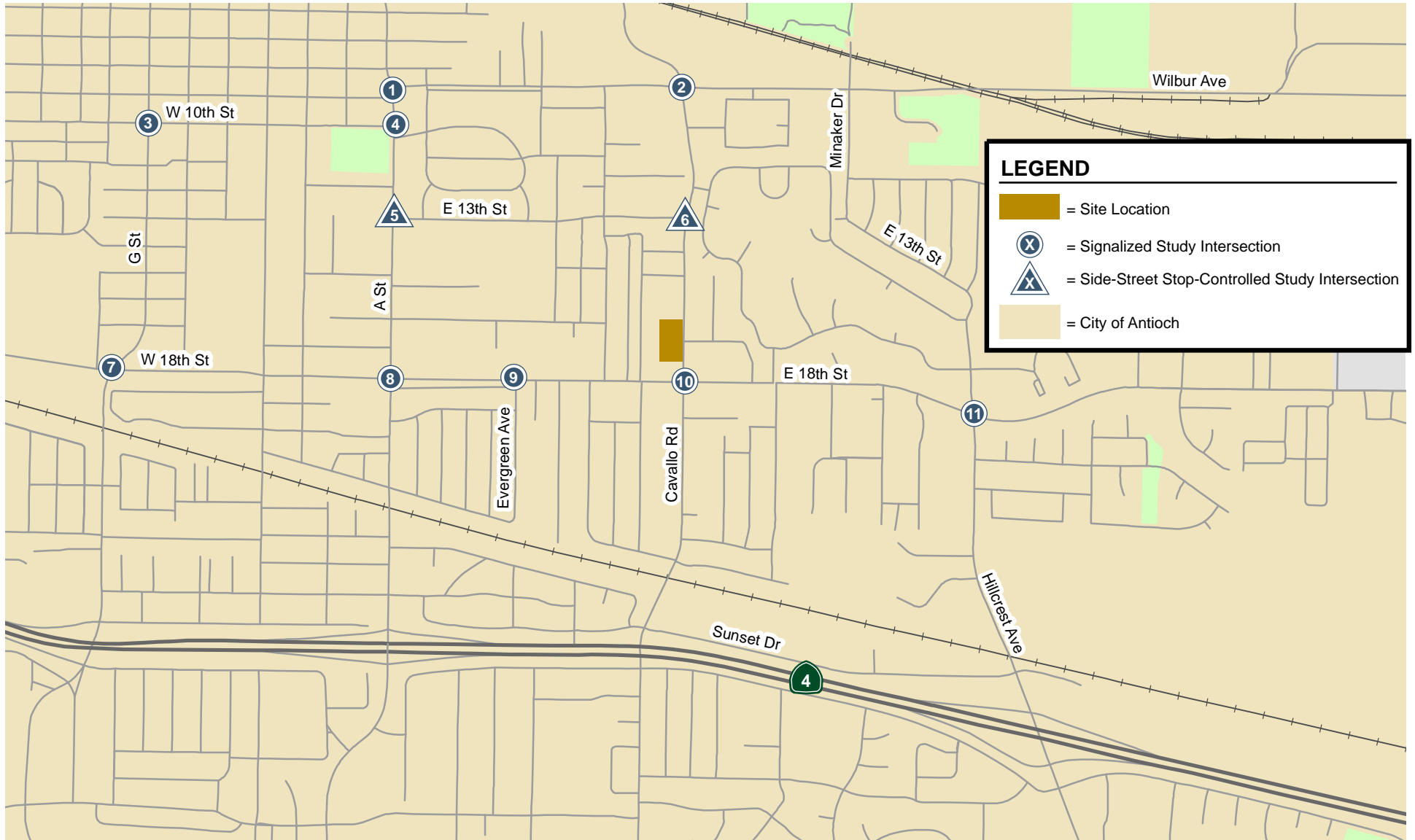
## Scope of Study

This study was conducted for the purpose of identifying the potential traffic impacts related to the proposed development. The potential impacts of the project were evaluated in accordance with the standards set forth by the City of Antioch and the Contra Costa Transportation Authority (CCTA), which serves as the Congestion Management Agency (CMA) for Contra Costa County. A County Congestion Management Program (CMP) analysis is not required because none of the study intersections are part of the CMP network. However, many of the study area roadways are considered routes of regional significance. The suburban arterial routes within the study area were evaluated in accordance with the East County Action Plan (ECAP). The traffic study includes an analysis of AM and PM peak-hour traffic conditions for nine signalized intersections and two unsignalized intersections in the vicinity of the project site. The analysis focuses on the peak commute periods from 7-9 AM and from 4-6 PM given that classes are primarily held between 7:30 AM and 4:30 PM and because it is during these hours that traffic conditions on the surrounding roadways are generally the most congested. The study also includes an analysis of student drop-off/pick-up circulation, and transit, bicycle, and pedestrian access.

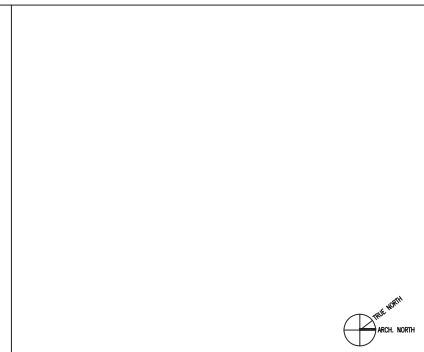
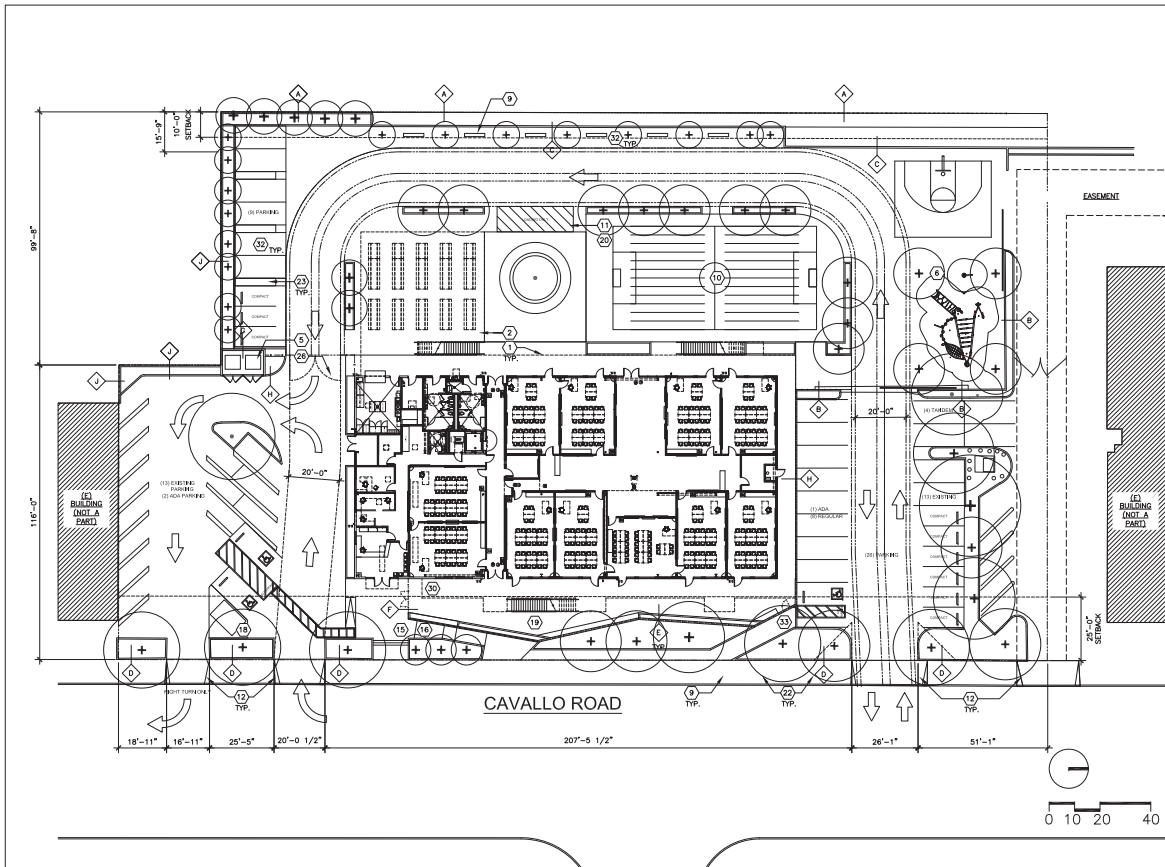
## Study Intersections

1. "A" Street and West 9<sup>th</sup> Street/Wilbur Avenue \*
2. Cavallo Road and Wilbur Avenue \*
3. "G" Street and West 10<sup>th</sup> Street
4. "A" Street and West 10<sup>th</sup> Street/Beede Way \*
5. "A" Street and East 13<sup>th</sup> Street (unsignalized)
6. Cavallo Road and East 13<sup>th</sup> Street (unsignalized)
7. "G" Street and West 18<sup>th</sup> Street
8. "A" Street and East 18<sup>th</sup> Street \*
9. Evergreen Avenue and East 18<sup>th</sup> Street \*
10. Cavallo Road and East 18<sup>th</sup> Street \*





**Figure 1**  
**Site Location and Study Intersections**



VICINITY MAP		SCALE:	1
		N.T.S.	
<b>GENERAL SUMMARY:</b>			
GENERAL PLAN:	DOWNTOWN SPECIFIC PLAN		
ZONING DESIGNATIONS:	DOWNTOWN MIXED USE (DMX)		
FEMA FLOOD ZONE:	SITE NOT LOCATED IN FLOOD ZONE		
<b>SIZE OF PROPERTY:</b>	GROSS:	57,251.44 SF (1.32 ACRES)	
	NET:	57,251.44 SF (1.32 ACRES)	
<b>TOTAL FLOOR AREA (GROSS):</b>	FIRST FLOOR:	13,240 SF	
	SECOND FLOOR:	11,117 SF	
	SUBTOTAL:	24,357 SF	
	BALCONIES OVERHANGS:	5,944 SF	
	COVERED LUNCH SHELTER:	2,147 SF	
<b>TOTAL BUILDING AREA:</b>		32,448 SF	
<b>FLOOR AREA RATIO (F.A.R.):</b>		0.5%	
<b>PERCENTAGE OF LOT COVERAGE:</b>		23%	
<b>PERCENTAGE OF NET:</b>		9%	
<b>LANDSCAPING AREA:</b>		10.5%	
<b>COMMON OPEN SPACE:</b>		42.2%	
<b>PRIVATE USABLE OPEN SPACE:</b>		22%	
<b>PARKING, DRIVEWAY, AND WALK:</b>		22%	
<b>PARKING SUMMARY:</b>			
<b>PARKING REQUIRED:</b>	<b>USE</b>	<b>FACTOR</b>	<b># SPACES REQ'D</b>
	GRADES TK-5	20' CLASSROOMS	1 PER CLASSROOM = 20
	OFFICE	2,950 SF	1 PER 250 SF = 9
	LEARNING LABS	2 CLASSROOMS	1 PER CLASSROOM = 2
	TOTAL # SPACES REQUIRED: 31		
<b>PARKING PROVIDED:</b>	<b>NORTH LOT</b>	<b>SOUTH LOT</b>	<b>OVERFLOW</b>
	STANDARD	14	19
	COMPACT	6	3
	TANDEM	4	4
	ADA	2	1
	TOTAL # SPACES PROVIDED: 50		

**SLO**  
SMITHFIELD OFFICE

ARCHITECT:  
**SMIFLEEOFFICE**  
564 S. 1st St., Ste. 100  
Antioch, CA 94509  
T. 925.257.8200 F. 925.257.8276  
www.smifleeoffice.com

PROJECT NAME:  
**Rocketship Antioch Public School**  
Antioch, CA 94509

DATE: 01.17.17  
REVISED:  
COORDINATION MEETING:  
APPROVAL:

SCALE: 1 N.T.S.

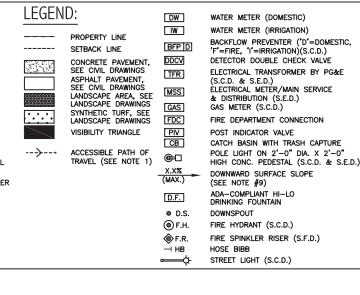
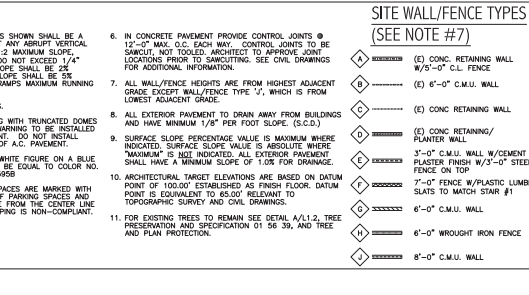
SCALE: 7 1" = 20'-0"

SCALE: 3 N.T.S.

SCALE: 4 N.T.S.

**SITE PLAN**

- SITE PLAN NOTES:**
- ACCESSIBLE PATH OF TRAVEL AS SHOWN SHALL BE A BARRIER-FREE ACCESS WITHOUT ANY ABRUPT VERTICAL CHANGES EXCEEDING 1/2" @ 1:2 MAXIMUM SLOPE. LOCATIONS PRIOR TO SAWCUTTING. SEE CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
  - EXCEPT THAT LEVEL CHANGES DO NOT EXCEED 1/4" TYPICAL. MAXIMUM CROSS SLOPE SHALL BE 2% EXCEPT AT RAMP AND CURB RAMPS MAXIMUM RUNNING SLOPE SHALL BE 8.33%.
  - DO NOT SCALE FROM DRAWINGS.
  - COLOR OF DETECTABLE WARNING WITH TRUNCATED DOMES TO BE YELLOW. DETECTABLE MARKING TO BE INSTALLED ON TOP OF CONCRETE PAVEMENT. DO NOT INSTALL DETECTABLE MARKING ON TOP OF A.C. PAVEMENT.
  - THE ISA SHALL CONSIST OF A WHITE FIGURE ON A BLUE BACKGROUND. THE BLUE SHALL BE EQUAL TO COLOR NO. 15000 IN FEDERAL STANDARD 595B.
  - WHERE ACCESSIBLE PARKING SPACES ARE MARKED WITH LINES, WITH MEASUREMENTS OF PARKING SPACES AND ACCESS AISLES SHALL BE MADE FROM THE CENTER LINE OF THE MARKING. DOUBLE STRIPING IS NON-COMPLIANT.
  - IN CONCRETE PAVEMENT PROVIDE CONTROL JOINTS @ 12'-0" MAX. O.C. EACH WAY. CONTROL JOINTS TO BE SAUCUT NOT TOOK. ARCHITECT TO APPROVE JOINT LOCATIONS PRIOR TO SAWCUTTING. SEE CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
  - ALL WALL/FENCE HEIGHTS ARE FROM HIGHEST ADJACENT GRADE EXCEPT WALL/FENCE TYPE 'J', WHICH IS FROM LOWEST ADJACENT GRADE.
  - ALL EXTERIOR PAVEMENT TO DRAIN AWAY FROM BUILDINGS AND HAVE MINIMUM 1/8" PER FOOT SLOPE. (S.C.D.)
  - SURFACE SLOPE PERCENTAGE VALUE IS MAXIMUM WHERE INDICATED. SURFACE SLOPE VALUE IS ABSOLUTE WHERE "MAXIMUM" IS NOT INDICATED. ALL EXTERIOR PAVEMENT SHALL HAVE A MINIMUM SLOPE OF 1.0% FOR DRAINAGE.
  - ARCHITECTURAL TARGET ELEVATIONS ARE BASED ON DATUM POINT OF 100.00' ESTABLISHED AS FINISH FLOOR. DATUM POINT IS EQUIVALENT TO 65-00' RELIANT TO TOPOGRAPHIC SURVEY AND CIVIL DRAWINGS.
  - FOR EXISTING TREES TO REMAIN SEE DETAIL A/1.1.2, TREE PRESERVATION AND SPECIFICATION 01 56 26, AND TREE AND PLAN PROTECTION.



- KEYNOTES:**
- LINE OF ROOF OVERHANG ABOVE
  - COVERED LUNCH SHELTER
  - 20' WIDE FIRE ACCESS LINE
  - VISIBILITY TRIANGLE PER CITY STANDARD
  - TRASH ENCLOSURE W/ DRAIN TO SEWER & HOT-COLD WATER SUPPLY. SEE AT.2
  - PLAY EQUIPMENT
  - SIGN TO READ "NO PARKING-FIRELANE"
  - WOOD BENCH
  - CONCRETE SIDEWALK (S.C.D.)
  - PAINTED "LAUNCH" LINES (SEE NOTE #11)
  - ZONE W/ PAINTED STRIPES
  - CONCRETE CURB & DRIVE APRON (S.C.D.)
  - CONCRETE WALKWAY (S.C.D.)
  - CONCRETE CURB & GUTTER (S.C.D.)
  - CONCRETE STEPS
  - CONCRETE RAMP
  - MONUMENT SIGN
  - ELECTRICAL TRANSFORMER
  - OUTDOOR SITTING AREA WITH BUILT-IN BENCHES
  - SYNTHETIC TURF (S.L.D.)
  - TREE (S.L.D.)
  - TREE (S.L.D.) (SEE NOTE #11)
  - 3'-0" W X 10'-0" L X 2'-0" H VEGETABLE GARDEN PLANTERS (6X6 LANDSCAPE TIES W/REAR STAKES)
  - CURB RAMP W/DETECTABLE MARKING
  - 2'-0" MANUALLY OPERATED GATE W/WORK-ORSENERMOUNTED LOCK, 6'-0" W.
  - CONCRETE SEAT WALL
  - 3'-0" X 5'-0" TREE WELL W/ D.G.
  - RUBBERISED SAFETY SURFACE
  - COVERED & SECURED BICYCLE PARKING
  - PEDESTAL MOUNTED EV. CHARGER ON CONC. PAD
  - DECOMPOSED GRANITE (D.G.)
  - FIRE DEPARTMENT ACCESS GATE
  - NOT USED
  - NOT USED

STAMP/SEAL

**SMIFLEEOFFICE**  
C-28798  
03.31.17  
STATE OF CALIFORNIA

SHEET TITLE:  
**SITE PLAN**

PROJ. NO.: 2017-12  
SHEET NO.:  
**A1.1**  
© 2017 SMIFLEEOFFICE

**Figure 2 Project Site Plan**

## 11. Hillcrest Avenue and East 18<sup>th</sup> Street \*

\* Denotes intersections on a route of regional significance

Per CCTA's *Technical Procedures*, a freeway segment level of service analysis is required when a project adds 50 trips or greater to a freeway segment. Because the proposed project is expected to generate less than 50 trips on any freeway segment, freeway segments were not evaluated.

### Analysis Time Periods

Traffic conditions at the study intersections were analyzed for the weekday AM and PM peak commute hours of traffic. Rocketship School activities would occur between 7:00 AM and 6:00 PM, with classes held between 7:30 AM and 4:30 PM on Monday, Tuesday, Wednesday, and Friday. On Thursdays, school start time would remain the same but dismissal would occur earlier at 2:15 PM, in order for teachers to have time for professional development after the students leave. On all school days, the morning student drop-off period would occur between 7:00 AM and 7:45 AM for all grades, while the afternoon pick-up periods would occur between 3:45 PM and 3:55 PM for TK and Kindergarten, between 4:00 PM and 4:10 PM for grades 1 and 2, and between 4:10 PM to 4:20 PM for grades 3, 4, and 5. Student pick-up for students in after-school programs would occur between 5:50 PM and 6:05 PM.

The peak hour of school traffic in the morning would coincide with the AM peak hour of commute traffic (generally between 7:00 and 9:00 AM). The peak hour of school traffic in the afternoon would coincide with the PM peak hour of commute traffic (typically between 4:00 and 6:00 PM). In addition, trips associated with after school programming would be added to the PM peak commute hour. It is during these peak commute periods that traffic is busiest and the impact on the roadway system by traffic from the school would be greatest.

### Analysis Scenarios

Traffic conditions were evaluated for the following scenarios:

**Scenario 1: Existing Conditions.** Existing traffic volumes at study intersections were based on traffic counts conducted in April 2017. The study intersections were evaluated with a level of service analysis using Synchro software in accordance with the *2010 Highway Capacity Manual* methodology<sup>1</sup>.

**Scenario 2: Existing plus Project Conditions.** Existing traffic volumes with the project were estimated by adding to existing traffic volumes the additional traffic generated by the project. Existing plus project conditions were evaluated relative to existing conditions in order to determine the effects the project would have on the existing roadway network.

**Scenario 3: Cumulative Conditions.** Cumulative traffic volumes represent traffic growth through the year 2040. Cumulative traffic volumes were estimated based on the available year 2040 forecasts from the CCTA travel demand forecast model.

---

<sup>1</sup> The *2010 Highway Capacity Manual (HCM)* does not support turning movements with shared and exclusive lanes, and intersections with more than four approaches. Intersections with these features were analyzed using the *2000 HCM*.

**Scenario 4: Cumulative plus Project Conditions.** Cumulative plus project conditions were estimated by adding to the cumulative traffic volumes the additional traffic estimated to be generated by the proposed project. Cumulative plus project conditions were evaluated relative to cumulative conditions to determine potential project impacts.

## Methodology

This section presents the methods used to determine the traffic conditions for each scenario described above. It includes descriptions of the data requirements, the analysis methodologies, and the applicable level of service standards.

### Data Requirements

The data required for the analysis were obtained from new traffic counts, previous traffic studies, CCTA, and field observations. The following data were collected from these sources:

- Existing traffic volumes,
- Existing lane configurations,
- Signal timing and phasing, and
- Year 2040 traffic volumes from the CCTA travel demand forecast model.

### Level of Service Standards and Analysis Methodologies

Traffic conditions at the study intersections were evaluated using level of service (LOS). *Level of Service* is a qualitative description of operating conditions ranging from LOS A, or free-flow conditions with little or no delay, to LOS F, or jammed conditions with excessive delays. The various analysis methods are described below.

#### Signalized Intersections

The City of Antioch evaluates level of service at signalized intersections based on the *2010 Highway Capacity Manual* (HCM) level of service methodology using Synchro software<sup>2</sup>. The *2010 HCM* method evaluates signalized intersection operations on the basis of average control delay time for all vehicles at the intersection. The City of Antioch level of service standard for signalized study intersections is mid-level LOS D or better (average delay of 50 seconds or less), except on routes of regional significance, where the standard is high-level LOS D or better (average delay of 55 seconds or less). Wilbur Avenue, West 10<sup>th</sup> Street, and East 18<sup>th</sup> Street are all routes of regional significance. Thus, all of the signalized study intersections are subject to the high-level LOS D standard.

According to the East County Action Plan (ECAP), the multi-modal transportation service objective (MTSO) for suburban arterial routes is to maintain LOS D or better (average delay of 55 seconds or less) at all signalized intersections. The correlation between average control delay and level of service is shown in Table 1.

---

<sup>2</sup> The *2010 Highway Capacity Manual* (HCM) does not support turning movements with shared and exclusive lanes, and intersections with more than four approaches. Intersections with these features were analyzed using the *2000 HCM*.

**Unsignalized Intersections**

Level of service at the unsignalized study intersections was based on the *2010 Highway Capacity Manual* (2010 HCM) method using the Synchro software. This method is applicable for both two-way and all-way stop-controlled intersections. The two unsignalized study intersections have stop control on the minor street (East 13<sup>th</sup> Street) and no control on the major street (“A” Street and Cavallo Road). The levels of service reported for these intersections are based on the average delay of the worst stop-controlled approach. The unsignalized study intersections are not on a Route of Regional Significance, and are therefore subject to the mid-level LOS D standard (average delay of 30 seconds or less). The correlation between average control delay and LOS for unsignalized intersections is shown in Table 2.

**Table 1  
Signalized Intersection Level of Service Definitions Based on Control Delay**

Level of Service	Description	Average Control Delay Per Vehicle (sec.)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	up to 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.1 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	Greater than 80.0

Source: Transportation Research Board, *2010 Highway Capacity Manual*, (Washington, D.C., 2010).

**Table 2**  
**Unsignalized Intersection Level of Service Definitions Based on Delay**

Level of Service	Description	Average Control Delay Per Vehicle (sec.)
A	Little or no traffic delay	10.0 or less
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	Extreme traffic delays	greater than 50.0

Source: Transportation Research Board, 2010 *Highway Capacity Manual* (Washington, D.C., 2010).

### Intersection Operations

For selected high-demand movements at key intersections, the estimated maximum vehicle queues were compared to the existing or planned storage capacity. The queuing analysis is presented for informational purposes only, since neither the City of Antioch nor the CMP have defined any policies related to queuing. Vehicle queues were calculated using a Poisson probability distribution, which estimates the probability of “n” vehicles for a vehicle movement using the following formula:

$$P(x = n) = \frac{\lambda^n e^{-\lambda}}{n!}$$

Where:

$P(x = n)$  = probability of “n” vehicles in queue per lane

$n$  = number of vehicles in the queue per lane

$\lambda$  = Average number of vehicles in the queue per lane (vehicles per hour per lane/signal cycles per hour)

The basis of the analysis is as follows: (1) the Poisson probability distribution is used to estimate the 95<sup>th</sup> percentile maximum number of queued vehicles per signal cycle for a particular movement; (2) the estimated maximum number of vehicles in the queue is translated into a queue length, assuming 25 feet per vehicle; and (3) the estimated maximum queue length is compared to the existing or planned available storage capacity for the movement.

### **Significance Criteria**

Significance criteria are used to establish what constitutes an impact. Impacts on signalized intersections are based on the significance criteria and level of service standards of the jurisdiction in which the intersection is located. For this analysis, significance criteria for impacts on signalized

intersections are based on the City of Antioch and the ECAP level of service standards. As mentioned in the previous section, the City of Antioch and the ECAP level of service standard for intersections on routes of regional significance, is high-level LOS D or better (average delay of 55 seconds or less for signalized intersections and 35 seconds or less for unsignalized intersections). Intersections that are not on a route of regional significance are subject to the City's mid-level LOS D standard (average delay of 50 seconds or less for signalized intersections and 30 seconds or less for unsignalized intersections).

According to the City of Antioch, a development is said to create a significant adverse impact on traffic conditions at a study intersection if for either peak hour, any of the following conditions occurs:

1. The level of service at a signalized intersection on a route of regional significance degrades from an acceptable level (high-level LOS D or better with an average delay of 55 seconds or less) under no-project conditions to an unacceptable level (LOS E or F) under project conditions, or
2. The project will add traffic to a signalized intersection on a route of regional significance that operates at an unacceptable level (LOS E or F) under no-project conditions, or
3. The level of service at an unsignalized intersection that is not on a route of regional significance degrades from an acceptable level (mid-level LOS D or better with average delay of 30 seconds or less) under no-project conditions to an unacceptable level (high LOS D, or LOS E or F) under project conditions, and the intersection warrants a traffic signal based on the *California Manual of Uniform Traffic Control Devices* (CA MUTCD) Peak-Hour Signal Warrant (Warrant 3).

A significant impact is said to be satisfactorily mitigated when measures are implemented that would restore intersection conditions to its level of service standard or to an average intersection delay that is equal or better than no-project conditions.

## Report Organization

The remainder of this report is divided into five chapters. Chapter 2 describes the existing roadway network, transit services, and pedestrian facilities. Chapter 3 describes the methods used to estimate project traffic and its impact on the existing transportation system. Chapter 4 describes cumulative conditions in the year 2040 and its impact on the transportation network, analyzed with and without project traffic. Chapter 5 presents the projects impacts on other transportation issues including an analysis of the site access and on-site circulation, student drop-off/pick-up circulation, vehicle queuing, and transit, bicycle, and pedestrian facilities. Chapter 6 includes a summary of project impacts, any proposed mitigation measures, and recommended improvements.

## 2. Existing Conditions

---

This chapter describes the existing conditions for transportation facilities in the vicinity of the site, including the roadway network, transit service, and pedestrian and bicycle facilities.

### Existing Roadway Network

Regional access to the project site is provided via State Route 4 (SR 4).

**SR 4** is an east/west freeway that extends from Hercules in Contra Costa County through San Joaquin, Calaveras, and Alpine Counties. In Antioch, SR 4 was recently widened to eight lanes, including two HOV lanes (one in each direction). SR 4 would provide access to and from the project site via interchanges at “A” Street and Hillcrest Avenue.

Local access within the study area is provided on “A” Street, East 18<sup>th</sup> Street, Cavallo Road, West 9<sup>th</sup> Street/Wilbur Avenue, West 10<sup>th</sup> Street/Beede Way, East 13<sup>th</sup> Street, Evergreen Avenue, and Hillcrest Avenue. These roadways are described below.

**“A” Street** is a north/south arterial roadway that extends from SR 4 to West 3<sup>rd</sup> Street, where it transitions into West 2<sup>nd</sup> Street. “A” Street is a designated route of regional significance south of East 18<sup>th</sup> Street. In the vicinity of the project site, “A” Street is a four-lane roadway with on-street parking.

**East 18<sup>th</sup> Street** is an east/west arterial roadway that extends from “L” Street to SR 160. East 18<sup>th</sup> Street is a designated route of regional significance between “A” Street and SR 160. In the vicinity of the project site, East 18<sup>th</sup> Street is a four-lane roadway with a center turn lane.

**Cavallo Road** is a north/south collector that extends from Wilbur Avenue south to East Tregallas Road, where it transitions into Garrow Drive. In the vicinity of the project site, Cavallo Road is a three-lane roadway with one lane in each direction of travel and a center turn lane. On-street parking and bike lanes exist intermittently along both sides of the street. Cavallo Road runs along the eastern project boundary and provides direct access to the Rocketship School site.

**West 9<sup>th</sup> Street/Wilbur Avenue** is an east/west arterial roadway that extends from “O” Street to the eastern city limits east of SR 160. West 9<sup>th</sup> Street/Wilbur Avenue is a designated route of regional significance west of SR 160. In the vicinity of the project site, Wilbur Avenue is a four-lane roadway while West 9<sup>th</sup> Street is a two-lane roadway.

**West 10<sup>th</sup> Street/Beede Way** is an east/west arterial roadway that extends from Shady Lane to the western city limits, where it transitions into Pittsburg-Antioch Highway. West 10<sup>th</sup> Street is a designated



route of regional significance. In the vicinity of the project site, West 10<sup>th</sup> Street/Beede Way is a two-lane roadway with on-street parking.

**East 13<sup>th</sup> Street** is an east/west local collector that extends from “A” Street to Cavallo Road. East 13<sup>th</sup> Street primarily serves the immediate residential neighborhoods surrounding the Kimball Elementary School. East 13<sup>th</sup> Street is a two-lane roadway with on-street parking.

**Evergreen Avenue** is a two-lane north/south local street with on street parking on both sides. It extends from East 18<sup>th</sup> Street south to Belshaw Street.

**Hillcrest Avenue** is primarily a four-lane north/south arterial roadway that extends from Prewett Ranch Drive north to Jacobsen Street. Hillcrest Avenue is a designated route of regional significance south of SR 4.

## Existing Pedestrian and Bicycle Facilities

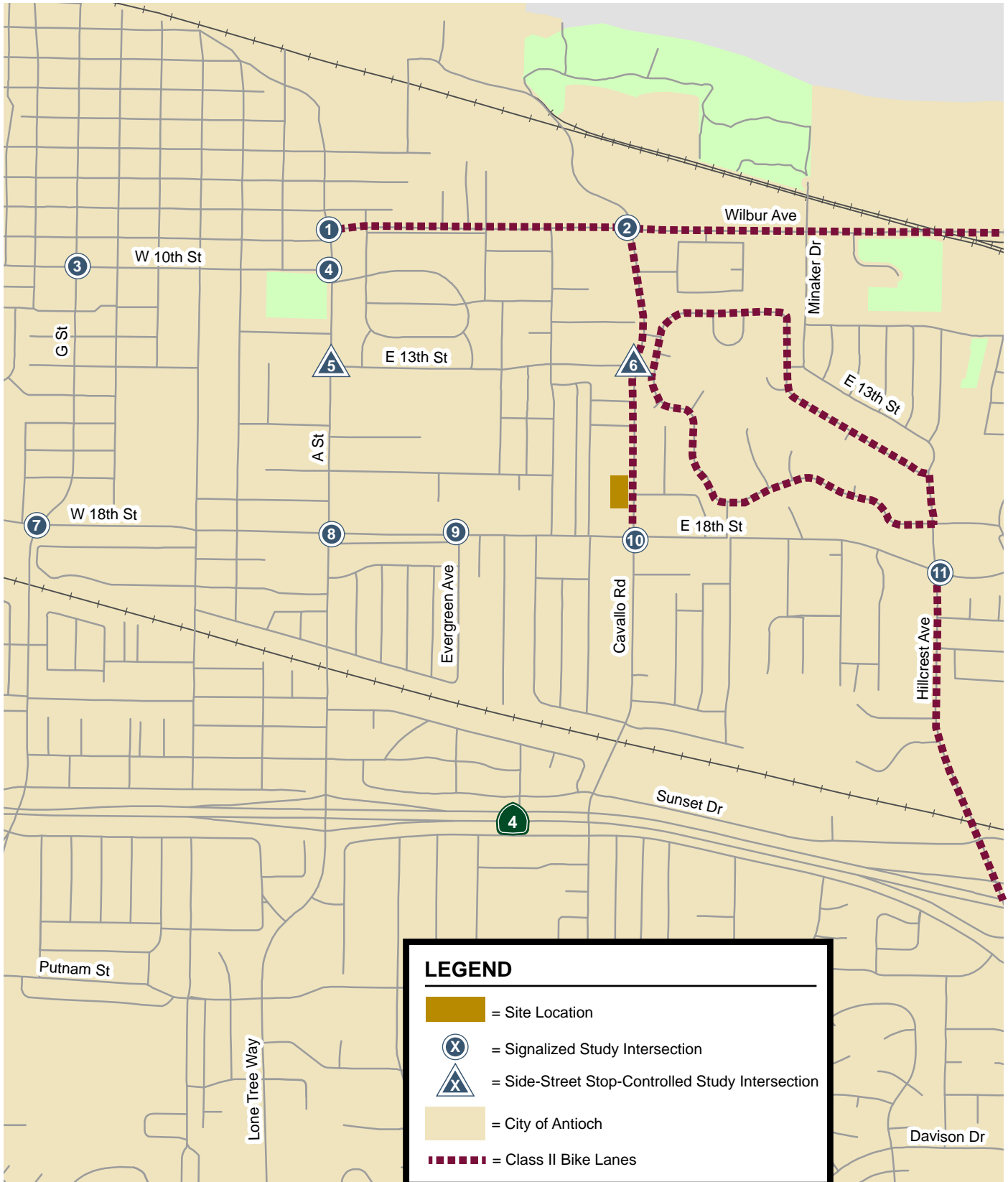
Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. In the project vicinity, sidewalks exist along both sides of “A” Street, East 18<sup>th</sup> Street, Cavallo Road, West 9<sup>th</sup> Street/Wilbur Avenue, West 10<sup>th</sup> Street/Beede Way, East 13<sup>th</sup> Street, Evergreen Avenue, and Hillcrest Avenue, providing pedestrian access to and from the project site. Marked crosswalks with pedestrian signal heads and push buttons are provided at all approaches of the signalized study intersections, except on the west leg of the East 18<sup>th</sup> Street Street/Evergreen Avenue intersection. At the unsignalized study intersections, marked crosswalks are provided along all stop-controlled approaches. Although one crosswalk connection is missing on East 18<sup>th</sup> Street at Evergreen Avenue, the overall network of sidewalks and crosswalks in the study area has good connectivity and provides students, parents, and staff with safe routes to the proposed school, nearby transit stops, and other points of interest in the vicinity of the project site.

There are several bicycle facilities in the vicinity of the project site. The existing bicycle facilities within the study area are described below, and are shown on Figure 3.

**Class I Bikeway/Trail** is an off-street path with exclusive right-of-way for non-motorized transportation used for commuting as well as recreation. The Delta de Anza Regional Trail is a paved, multi-use trail approximately two miles south of the project site that currently spans over 15 miles of the planned 25-mile length. The trail generally follows the East Bay Municipal Utility District's corridor and the Contra Costa Water District's canal, and once completed, will connect the Cities of Concord, Bay Point, Pittsburg, Antioch, and Oakley as well as provide access to Contra Loma Regional Park. Access to the Delta de Anza Regional Trail from the project site is provided via Hillcrest Avenue.

**Class II Bike Lanes** are preferential use areas within a roadway designated for bicycles. Within the vicinity of the project, Class II bikeways are present along both sides Wilbur Avenue between “A” Street and Wilbur Lane, Cavallo Road between Wilbur Avenue and East 18<sup>th</sup> Street, and Hillcrest Avenue between East 18<sup>th</sup> Street and Prewett Ranch Drive. There is also a bike lane on one side of Lake Drive and Hillcrest Avenue that facilitates bike travel in clockwise loop around Lake Alhambra.

**Class III Bike Routes** are signed bike routes that provide a connection through residential, downtown, and rural/hillside areas to Class I and Class II facilities. Bike routes serve as transportation routes within neighborhoods to parks, schools, and other community amenities. Although none of the residential streets near the project site (e.g., East 13<sup>th</sup> Street, Noia Avenue, and East 14<sup>th</sup> Street) are designated as bike routes, due to their low traffic volumes, many of them are conducive to bicycle usage.



**Figure 3**  
Existing Bicycle Facilities

## Existing Transit Service

Existing transit service near the project site is provided by the Eastern Contra Costa Transit Authority (Tri Delta Transit). The study area is served directly by eight local bus routes. Bus lines that run through the study area are summarized in Table 3, illustrated in Figure 4, and described below.

**Table 3**  
**Existing Transit Services**

Bus Route	Route Description	Headway <sup>1</sup>
Local Route 380	Pittsburg/Bay Point BART Station to Tri Delta Transit Station	30 - 35 min
Local Route 383	Antioch Park & Ride to Lone Tree Way/Hillcrest Ave.	60 min
Local Route 387	Pittsburg/Bay Point BART Station to Tri Delta Transit Station	60 min
Local Route 388	Pittsburg/Bay Point BART Station to Deer Valley Kaiser Medical Center	45 - 55 min
Local Route 391	Pittsburg/Bay Point BART Station to Brentwood Park & Ride	35 - 40 min
Local Route 392 *	Pittsburg/Bay Point BART Station to Antioch Park & Ride	60 min
Local Route 393 *	Mariners Cover/Pacifica to Brentwood Park & Ride	60 min
Local Route 394 *	Pittsburg/Bay Point BART Station to Antioch Park & Ride	60 min

Notes:  
 \* Route operates only on weekends.  
<sup>1</sup> Approximate headways during peak commute periods.

**Local Route 380** operates on East 18<sup>th</sup> Street and Cavallo Road in the vicinity of the project. Route 380 operates between the Pittsburg/Bay Point BART Station and the Tri Delta Transit Station, with the closest bus stops located adjacent to the project site on Cavallo Road at Amber Drive and East 18<sup>th</sup> Street, approximately 500 feet from the project site. Weekday service is provided from approximately 3 AM to 11 PM with 30- to-35-minute headways during commute hours.

**Local Route 383** operates primarily north-south on Hillcrest Avenue in the vicinity of the project site. Route 383 runs between the Antioch Park & Ride lot and the Lone Tree Way/Hillcrest Avenue intersection. The closest bus stop is located on East 18<sup>th</sup> Street at the Hillcrest Avenue intersection, approximately 0.6 miles from the project site. Service is provided from approximately 7 AM to 5 PM with 60- to-90-minute headways during commute hours.

**Local Route 387** operates east-west primarily on Wilbur Avenue, between the Pittsburg/Bay Point BART Station and the Tri Delta Transit Station. The closest stops are located at the intersection of Cavallo Road and Wilbur Avenue, which is about a half mile from the project site. Weekday service is provided from approximately 5 AM to 9 PM, with 60-minute headways during commute hours.

**Local Route 388** operates on “A” Street and East 18<sup>th</sup> Street in the vicinity of the project site, and runs between the Pittsburg/Bay Point BART Station and the Deer Valley Kaiser Medical Center. The closest bus stops are located at the intersection of Cavallo Road and East 18<sup>th</sup> Street, which is less than 1,000 feet from the project site. Weekday service is provided from approximately 5:30 AM to 11:30 PM with 45- to 55-minute headways during commute hours.



Figure 4  
Existing Transit Services

**Local Route 391** operates on Hillcrest Avenue in the vicinity of the project, and runs between the Pittsburg/Bay Point BART Station and the Brentwood Park & Ride lot. The closest stops are located at the intersection of Hillcrest Avenue and East 18<sup>th</sup> Street, which is about 0.6 miles from the project site. Weekday service is provided from approximately 6 AM to 1 AM (next day), with 35- to-40-minute headways during commute hours.

**Local Route 392** operates on “A” Street in the vicinity of the project, and runs between the Pittsburg/Bay Point BART Station and the Antioch Park & Ride lot. The closest bus stops are located on “A” Street at the East 13<sup>th</sup> Street and East 16<sup>th</sup> Street intersections, which are about one half-mile from the project site. Service is provided only on weekends from approximately 5 AM to 2 AM (next day) with about 60-minute headways.

**Local Route 393** operates on Hillcrest Avenue in the vicinity of the project, and runs between Mariners Cove/Pacifica and the Brentwood Park & Ride lot. The closest stops are located at the intersection of Hillcrest Avenue and East 18<sup>th</sup> Street, which is about 0.6 miles from the project site. This route operates on weekends only from approximately 5 AM to 2 AM (next day), with about 60-minute headways.

**Local Route 394** operates east-west on Hillcrest Avenue in the vicinity of the project, and runs between the Pittsburg/Bay Point BART Station and the Antioch Park & Ride lot. The closest stops are located at the intersection of Hillcrest Avenue and East 18<sup>th</sup> Street, which is about 0.6 miles from the project site. This route operates on weekends only from approximately 7 AM to 9 PM, with about 60-minute headways.

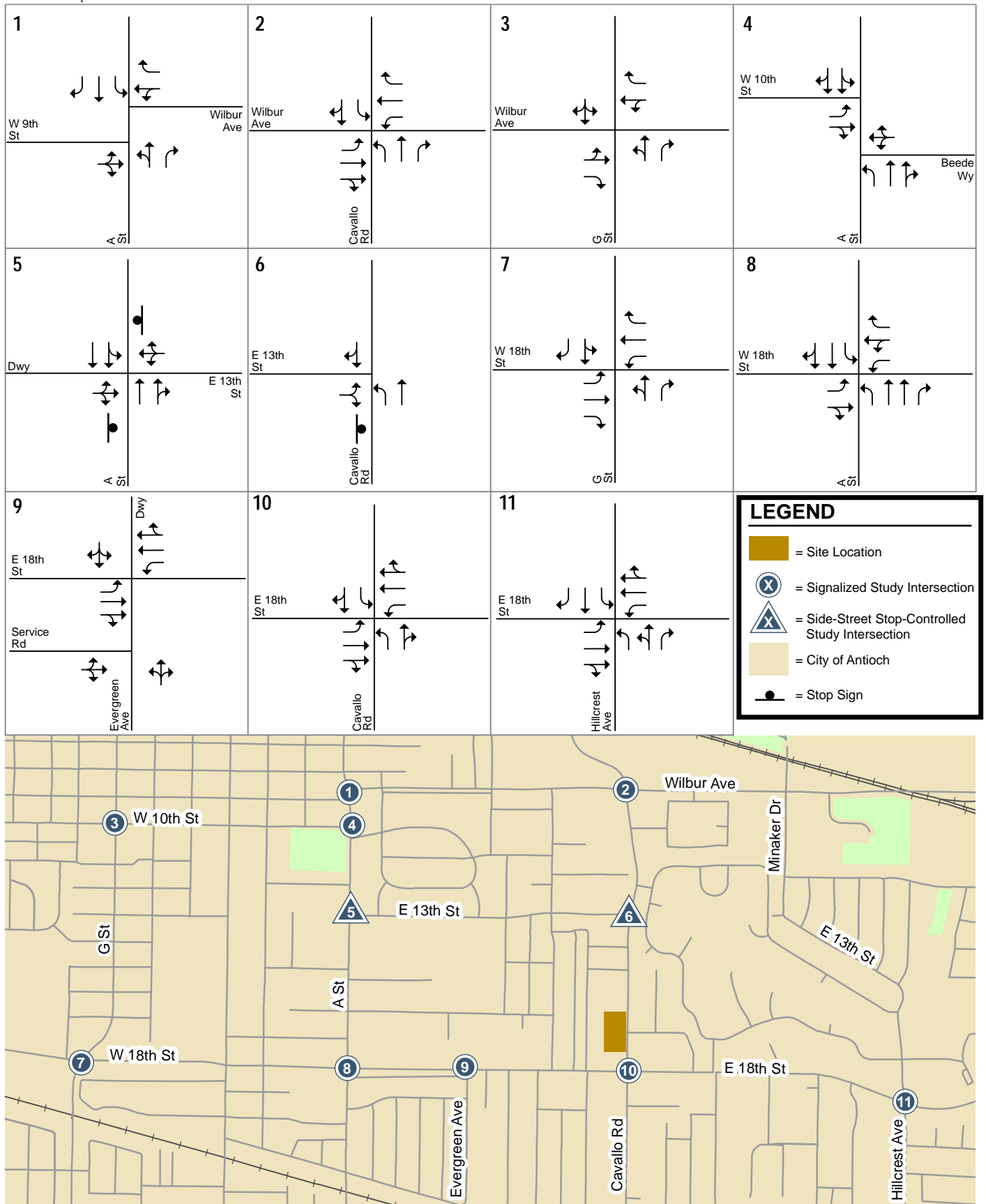
## Existing Intersection Lane Configurations

The existing lane configurations at the study intersections were determined by observations in the field and are shown on Figure 5.

## Existing Traffic Volumes

Existing traffic volumes at nine study intersections were obtained from peak-hour counts collected on April 6<sup>th</sup>, 2017. AM peak-hour traffic volumes at two study intersections (“G” Street/10<sup>th</sup> Street and the “G” Street/18<sup>th</sup> Street) are based on Spring 2016 counts conducted for the Antioch High School Street Closure Traffic Study. However, the previous traffic analysis did not analyze the PM peak commute hours from 4 to 6 PM. Therefore, new turning-movements counts were conducted at these intersections in June 2017 and seasonally adjusted to reflect typical traffic volumes when Antioch schools are in session. The existing peak-hour intersection volumes are shown in Figure 6. It should be noted that at the intersection of “A” Street and East 13<sup>th</sup> Street, the traffic counts recorded vehicles illegally turning left into the outbound-only driveway of the Higgins Chapel property. Intersection turning-movement counts conducted for this analysis are presented in Appendix A.

# Rocketship Antioch



**Figure 5**  
Existing Lane Configurations

Rocketship Antioch

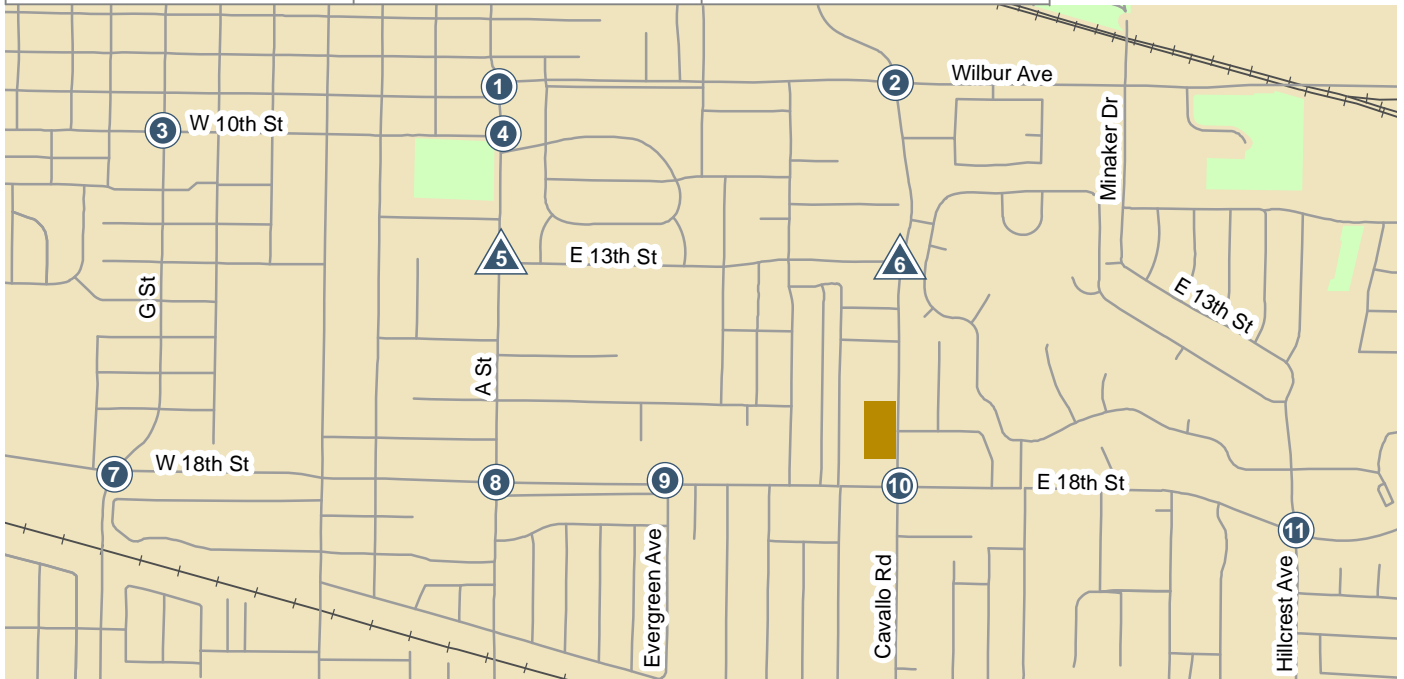
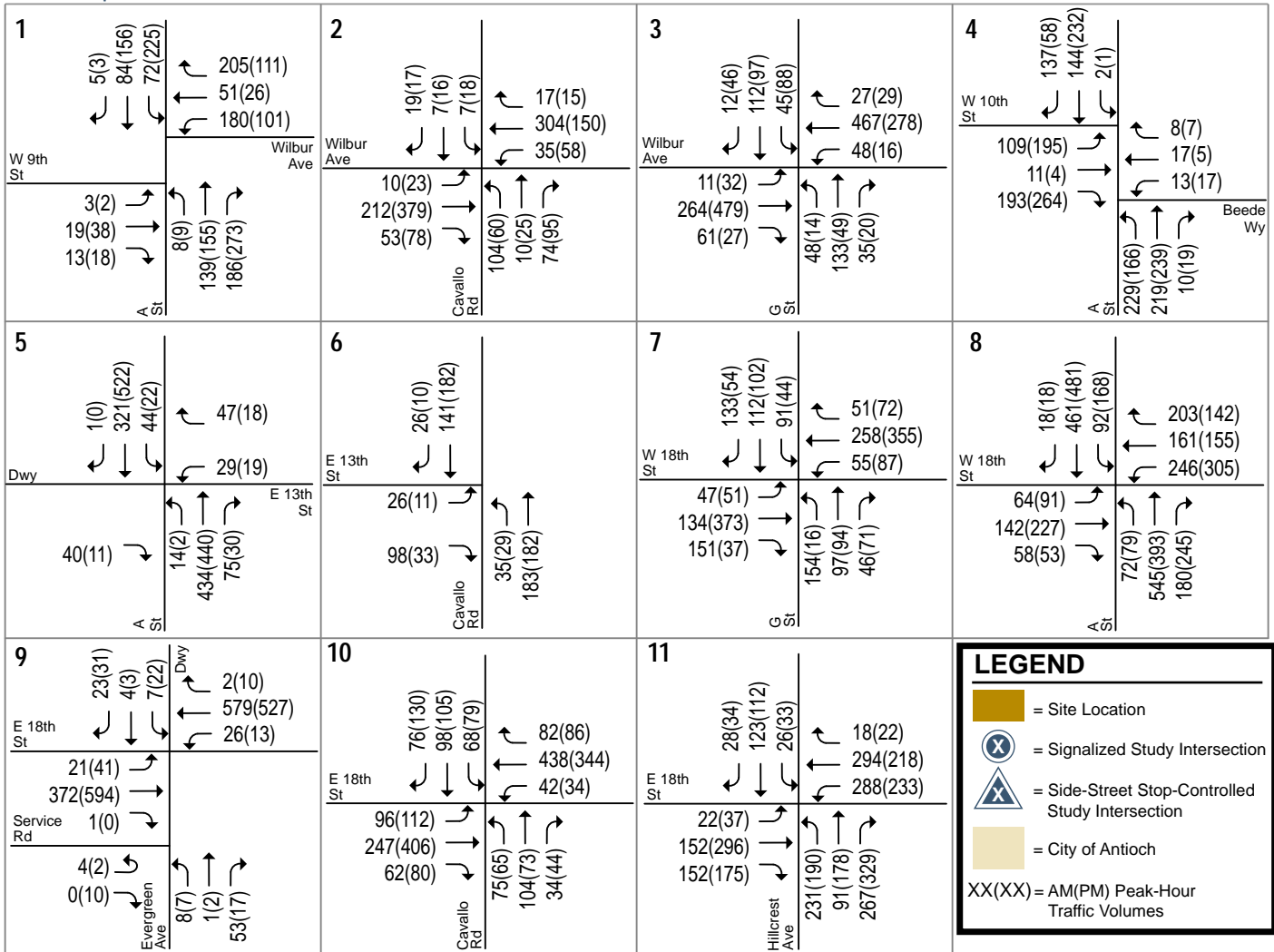


Figure 6  
Existing Traffic Volumes

## Existing Intersection Levels of Service

Intersection levels of service were evaluated against the City of Antioch and ECAP standards. The results of the analysis show that all of the signalized study intersections currently operate at an acceptable level of service (high-level LOS D or better) during both the AM and PM peak hours.

The stop-controlled East 13<sup>th</sup> Street approaches to “A” Street and Cavallo Road currently operate at LOS B during both peak hours, which complies with the City’s mid-level LOS D standard for intersections not on a Route of Regional Significance. The favorable level of service at the “A” Street intersection can be attributed to the relatively low left-turn volumes and the four-lane cross section on “A” Street. At the Cavallo Road intersection, a left-turn lane on northbound Cavallo Road allows turning vehicles to wait for a gap in on-coming traffic without disrupting the flow of northbound through traffic. Furthermore, the center turn lane in the median of Cavallo Road allows the left turn from eastbound East 13<sup>th</sup> Street to northbound Cavallo Road to be completed in two stages. Vehicles can cross southbound Cavallo Road and then stop in the center turn lane while waiting for a gap in the northbound traffic flow.

Results of the intersection LOS analysis under existing conditions are summarized in Table 4. The intersection levels of service calculation sheets are included in Appendix C.

## Observed Existing Traffic Conditions

Traffic conditions in the field were observed in order to identify existing operational deficiencies and to confirm the accuracy of calculated intersection levels of service. The purpose of this effort was (1) to identify any existing traffic problems that may not be directly related to level of service, and (2) to identify any locations where the level of service analysis does not accurately reflect existing traffic conditions.

Overall, most study intersections operated adequately during both the AM and PM peak hours of traffic, and the level of service analysis appears to accurately reflect actual existing traffic conditions. However, field observations showed that some operational problems currently occur during the PM peak commute hour. These issues are described below.

### “A” Street and East 18<sup>th</sup> Street

During the PM peak hour, congestion on northbound “A” Street extends to the upstream intersection of Belshaw Street, causing vehicles to wait through at least two signal cycles to clear the intersection. Queues in both the eastbound and westbound through lanes occasionally extend beyond the end of their respective left-turn pocket, causing minor delays for vehicles trying to turn access the left-turn pockets. However, the signal’s split phase allows all vehicles on these approaches to clear within one signal cycle. During the AM peak hour, there were no observed operational issues.



**Table 4**  
**Existing Intersection Levels of Service**

Study Number	Intersection	Peak Hour	Control Type	Existing Conditions	
				Average Delay	LOS
1	"A" Street and West 9th Street/Wilbur Avenue*	AM	Signal	30.2	C
		PM		35.4	D
2	Cavallo Road and Wilbur Avenue*	AM	Signal	27.9	C
		PM		24.0	C
3	"G" Street and West 10th Street* <sup>2</sup>	AM	Signal	11.5	B
		PM		10.1	B
4	"A" Street and West 10th Street/Beede Way*	AM	Signal	26.7	C
		PM		28.8	C
5	"A" Street and East 13th Street	AM	TWSC <sup>1</sup>	16.1	C
		PM		16.0	C
6	Cavallo Road and East 13th Street	AM	TWSC <sup>1</sup>	10.6	B
		PM		10.3	B
7	"G" Street and West 18th Street* <sup>2</sup>	AM	Signal	20.3	D
		PM		26.1	C
8	"A" Street and East 18th Street* <sup>3</sup>	AM	Signal	40.2	D
		PM		49.2	D
9	Evergreen Avenue and East 18th Street* <sup>3</sup>	AM	Signal	25.0	C
		PM		26.9	C
10	Cavallo Road and East 18th Street*	AM	Signal	22.7	C
		PM		23.3	C
11	Hillcrest Avenue and East 18th Street* <sup>3</sup>	AM	Signal	35.2	D
		PM		39.6	D

Notes:

TWSC = Two-Way Stop Control

\* Denotes an intersection on a Route of Regional Significance

<sup>1</sup> For TWSC intersections, the worst approach's delay and level of service are reported.

<sup>2</sup> PM counts were seasonally adjusted to reflect traffic when Antioch schools are in session.

<sup>3</sup> The *Highway Capacity Manual* (HCM) 2010 does not support turning movements with shared and exclusive lanes. Therefore, this intersection was analyzed using the HCM 2000.

**Bold** indicates a substandard level of service.

**Bold** indicates a significant project impact.

## 3. Existing Plus Project Conditions

---

This chapter describes traffic conditions with the project. It begins with a description of the transportation system under existing plus project conditions and the method by which project traffic is estimated. A summary of levels of service under existing plus project traffic conditions is presented in this chapter. Existing plus project conditions are represented by existing traffic conditions with the addition of traffic generated by the project.

### Transportation Network under Existing Plus Project Conditions

It is assumed in this analysis that the transportation network under existing plus project conditions would be the same as the existing transportation network.

### Project Trip Estimates

The magnitude of traffic produced by a new development and the locations where that traffic would appear were estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. In determining project trip generation, the magnitude of traffic traveling to and from the project was estimated for the AM and PM peak hours. As part of the project trip distribution, the directions to and from which the project trips would travel were estimated. In the project trip assignment, the project trips were assigned to specific streets and intersections. These procedures are described below.

#### Trip Generation

The trip generation rates for the proposed school are based on counts Hexagon Transportation Consultants, Inc. conducted at existing Rocketship Schools in San Jose between 2012 and 2014. All of the surveyed schools have similar enrollment size and school hours as the proposed new Rocketship school in Antioch. The observed trip generation rates are presented in Table 5. The trip generation rates at Rocketship Schools in San Jose are significantly higher than the elementary school trip rates published in the Institute of Transportation Engineers' *Trip Generation Manual, 9th Edition*. The magnitude of traffic generated by the proposed school was estimated by multiplying the observed Rocketship School trip generation rates by the proposed enrollment (600 students). Given that the existing building on the site is currently vacant, no credits or reductions were assumed for the trips generated from the previous use.

The proposed Rocketship school will implement a Transportation Demand Management (TDM) Program that will encourage students and employees to carpool, take transit, or use active modes of transport to get to and from school. Proposed TDM measures include carpool matching, financial incentives for parents who carpool, and a ride-share allowance for staff members who live within two

miles of the project site. The TDM program is expected to reduce the vehicle trips and parking demand generated by the proposed school compared to that observed at other Rocketship schools in San Jose, which do not have similar TDM programs. To be conservative, this report assumes no trip reductions for TDM measures. It should also be noted that while the trips generated by the proposed school would be new to the roadways immediately adjacent to the project site, in a regional context, the Rocketship school trips would be merely reassigned trips from other schools in the area where the students would have otherwise attended. However, to be conservative, project trips were added to the roadway network without reassigning existing vehicle trips associated with the nearby elementary schools (i.e. Kimball Elementary School, Fremont Elementary School, Belshaw Elementary School).

**Table 5  
Trip Generation Rate Comparison**

Land Use	Enrollment	Trip Rate (vehicle trips per student)		
		Daily <sup>7</sup>	AM Peak Hour	PM Peak Hour <sup>8</sup>
<b>Observed</b>				
Rocketship Si Se Puede Academy <sup>1</sup>	508 Students	2.60	0.91	0.37
Rocketship Mateo Sheedy Elementary <sup>2</sup>	591 Students	2.51	0.88	0.39
Rocketship Brilliant Minds <sup>3</sup>	607 Students	3.34	1.17	0.68
Rocketship Discovery Prep <sup>4</sup>	482 Students	1.99	0.69	0.44
Rocketship Mosaic Elementary <sup>5</sup>	583 Students	3.31	1.16	0.70
<b>Rocketship Average</b>	<b>554 Students</b>	<b>2.75</b>	<b>0.96</b>	<b>0.52</b>
<b>Published</b>				
Elementary School <sup>6</sup>		1.29	0.45	0.15
<b>Notes</b>				
<sup>1</sup> Based on Hexagon Transportation Consultants survey conducted at Rocketship Si Se Puede Academy on 12/4/12.				
<sup>2</sup> Based on Hexagon Transportation Consultants survey conducted at Rocketship Mateo Sheedy Elementary on 11/27/12.				
<sup>3</sup> Based on Hexagon Transportation Consultants surveys conducted at Rocketship Brilliant Minds Academy on 9/17/13 and 10/4/13 .				
<sup>4</sup> Based on Hexagon Transportation Consultants survey conducted at Rocketship Discovery Prep on 10/28/14 .				
<sup>5</sup> Based on Hexagon Transportation Consultants survey conducted at Rocketship Mosaoc Elementary on 10/29/14 .				
<sup>6</sup> Source: <i>Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition</i> , Elementary School (ITE Land Use #520).				
<sup>7</sup> Observed daily trip rate was estimated by multiplying the AM peak hour rate by the ratio of daily trip rate to the AM trip rate (1.29/.45) available in the <i>Institute of Transportation Engineers (ITE) Trip Generation Manual, 8th Edition</i> for Elementary School (ITE Land Use #520).				
<sup>8</sup> PM peak hour trip generation reflects 4 PM - 5 PM, which is when peak project traffic and peak background traffic overlap.				

The trip generation estimates are presented in Table 6. Based on the surveyed trip generation rates and an enrollment of 600 students, the project would generate 1,650 daily trips, 578 trips (314 inbound and 264 outbound) during the AM peak hour, and 314 trips (128 inbound and 186 outbound) during the PM peak hour.

**Trip Distribution and Assignment**

The trip distribution pattern for the project was estimated based on existing travel patterns on the surrounding roadway network and the school’s anticipated attendance area. It is anticipated that

Rocketship will draw some students from other public elementary schools in the vicinity including Kimball Elementary School, Fremont Elementary School, and Belshaw Elementary School. However, as previously stated, the traffic analysis is conservative in that Rocketship trips were merely added to existing traffic volumes without any reassignment of existing elementary school trips. The trip distribution pattern for the project is shown on Figure 7. Project trips were assigned based on the directions of approach and departure, as well as the roadway network connections in accordance with the project trip distribution pattern. The project trip assignment at each study intersection is shown graphically on Figure 8.

**Table 6  
Project Trip Generation Estimates**

Land Use	Size	Daily		AM Peak Hour			PM Peak Hour <sup>2</sup>				
		Rate <sup>3</sup>	Trips	Rate	In	Out	Total	Rate	In	Out	Total
<b>Proposed Use</b>											
Elementary School <sup>1</sup>	600 Students	2.75	1,650	0.963	314	264	578	0.523	128	186	314

Notes

<sup>1</sup> Peak hour trip rates (per student) based on Hexagon Transportation Consultants surveys conducted in 2012 through 2014 at five Rocketship elementary schools in San Jose.

<sup>2</sup> PM peak hour trip generation reflects 4 PM - 5 PM, which is when peak project traffic and peak background traffic overlap.

<sup>3</sup> Daily trip rate was derived by multiplying the AM peak hour rate by the ratio of daily trip rate to the AM trip rate (1.29/.45) available in the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition* for Elementary School (ITE Land Use #520).

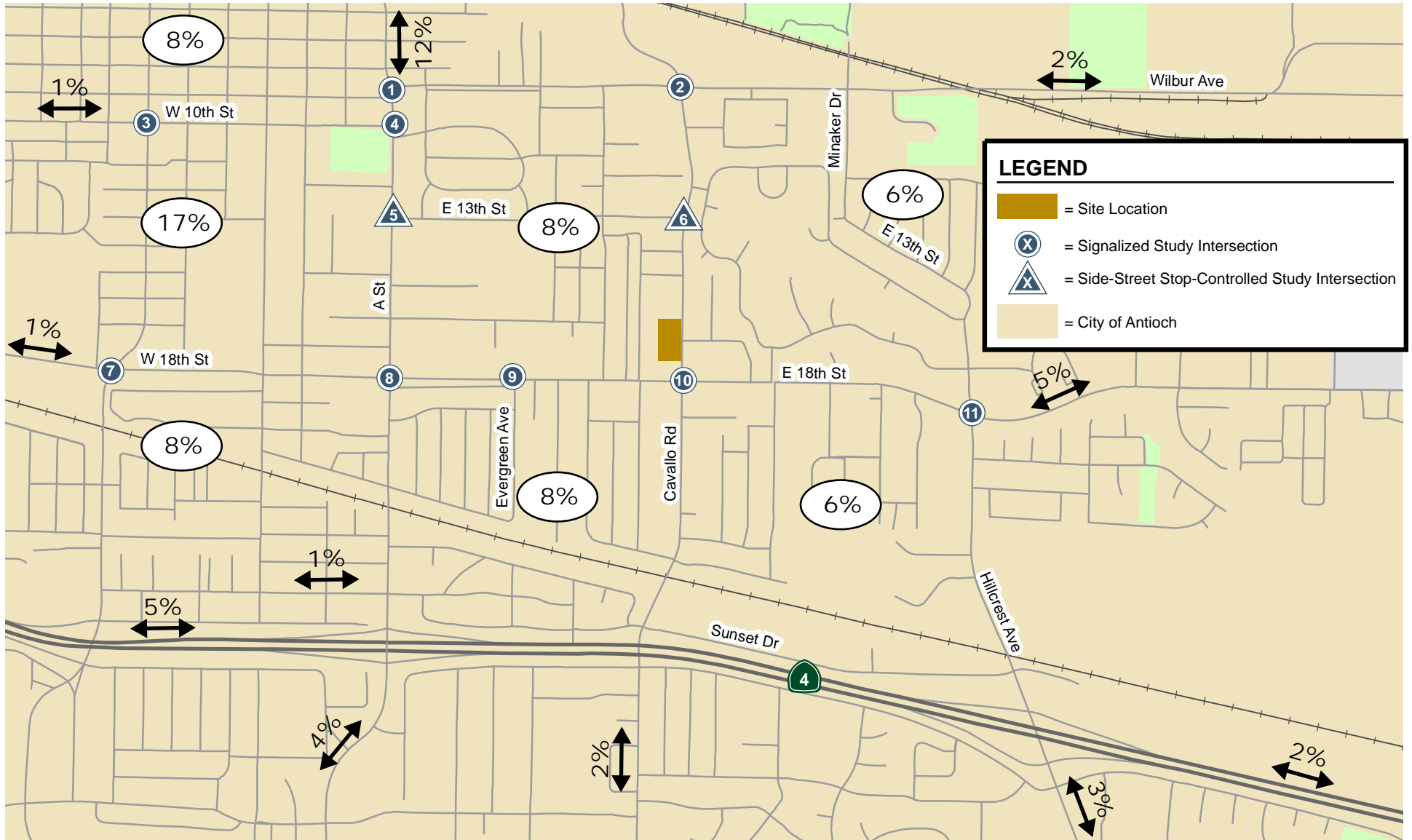
### Existing Plus Project Traffic Volumes

Project trips, as represented in the above project trip assignment, were added to existing traffic volumes to obtain existing plus project traffic volumes. Existing plus project conditions were evaluated relative to existing conditions in order to determine potential project impacts. The existing plus project traffic volumes are shown on Figure 9. A tabular summary of project traffic at each study intersection is contained in Appendix B.

### Existing Plus Project Intersection Analysis

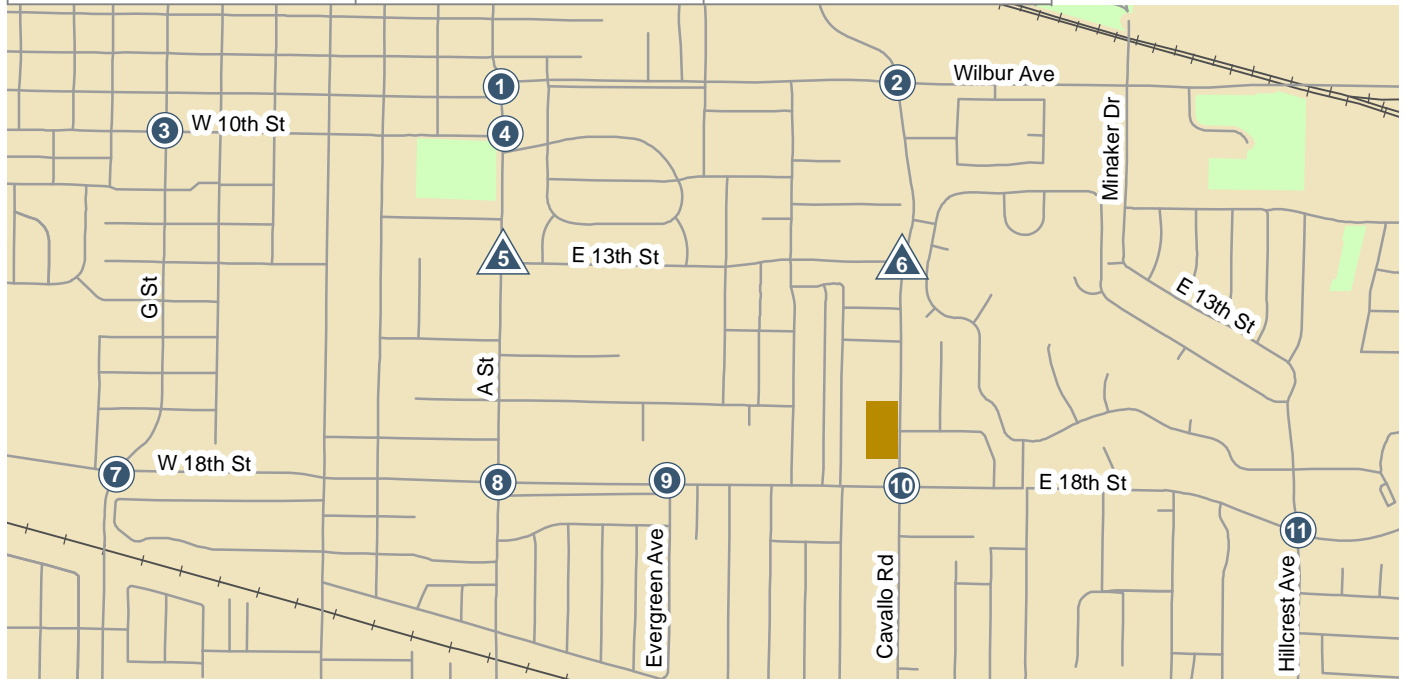
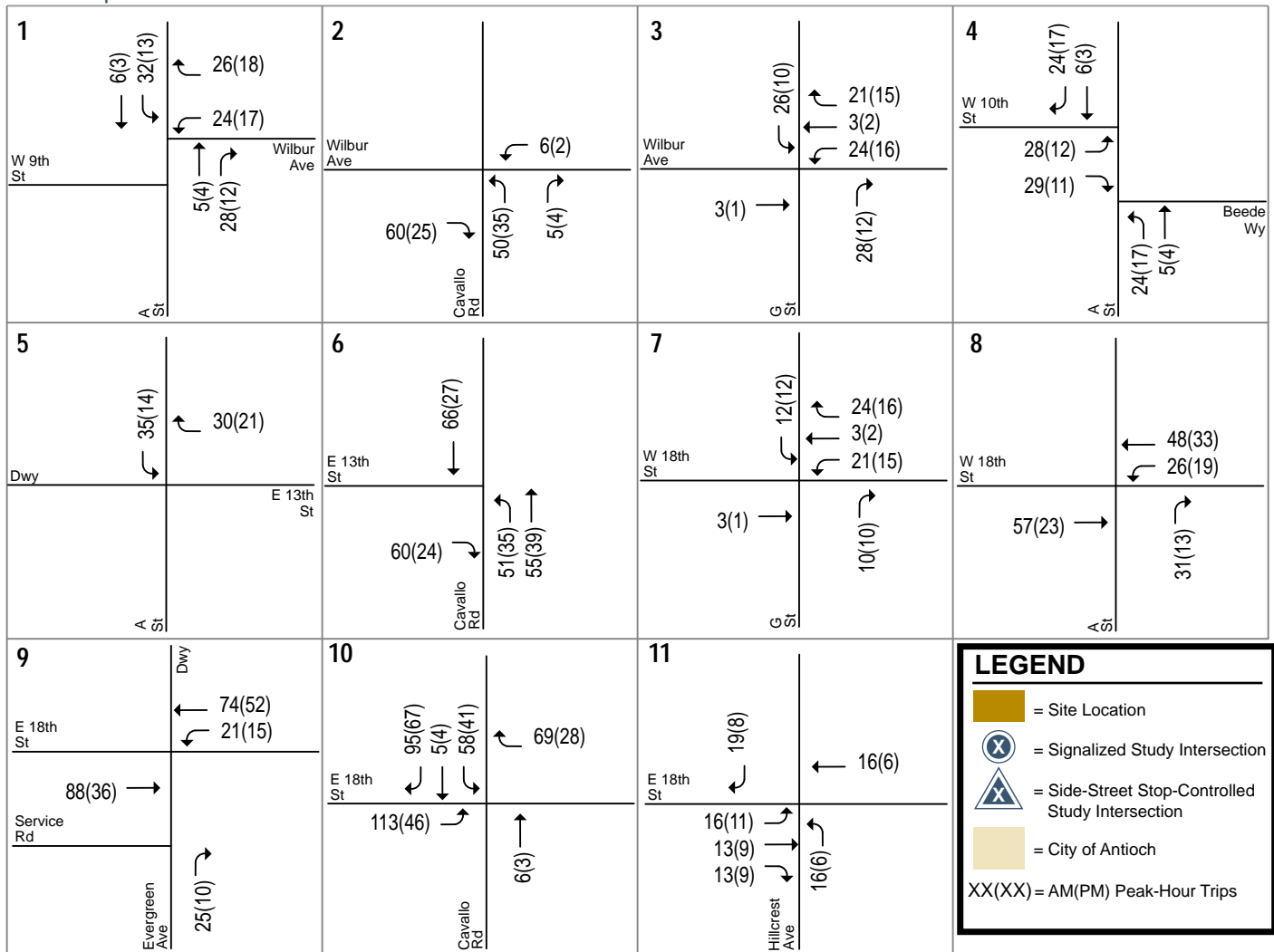
The results of the intersection level of service analysis under existing plus project conditions are summarized in Table 7. The results show that all of the signalized study intersections would continue to operate at acceptable levels of service (high-level LOS D or better).

The worst stop-controlled approaches at both unsignalized study intersections would operate at LOS C or better under existing plus project conditions during both peak hours, which complies with the City’s mid-level LOS D standard for intersections not on a route of regional significance.



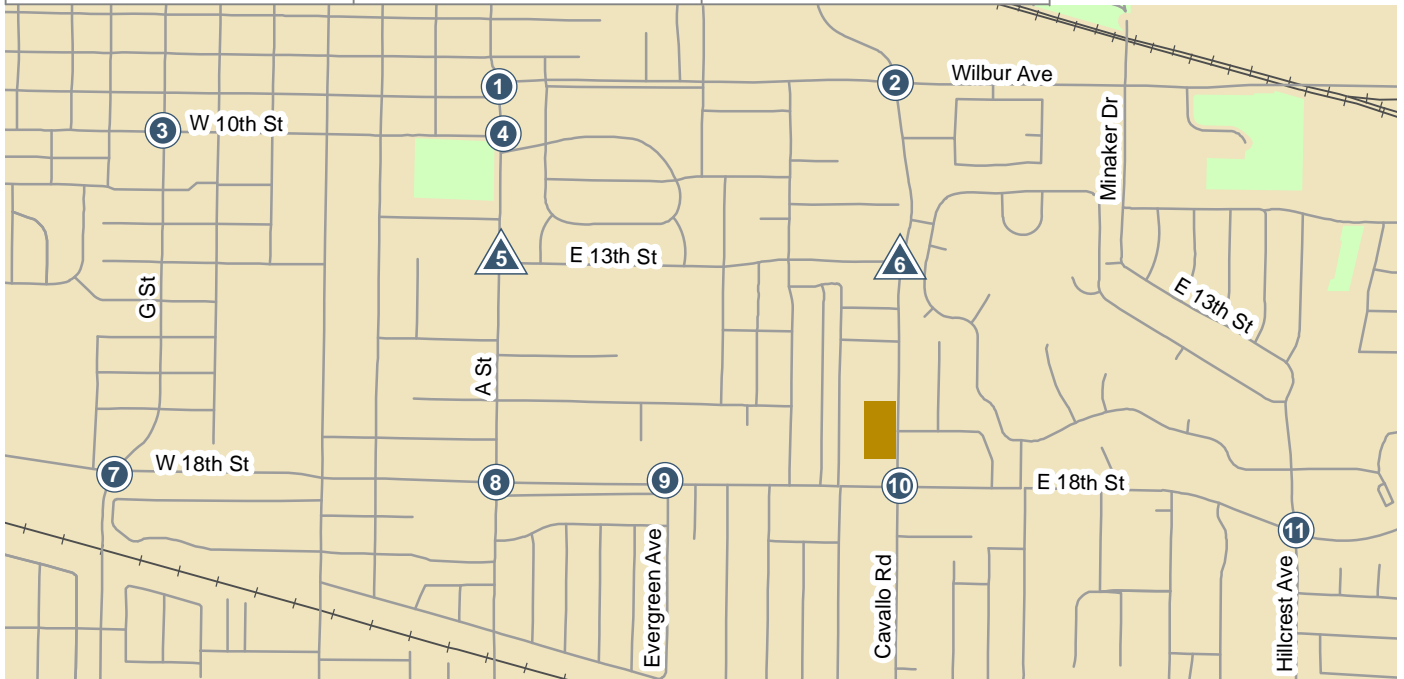
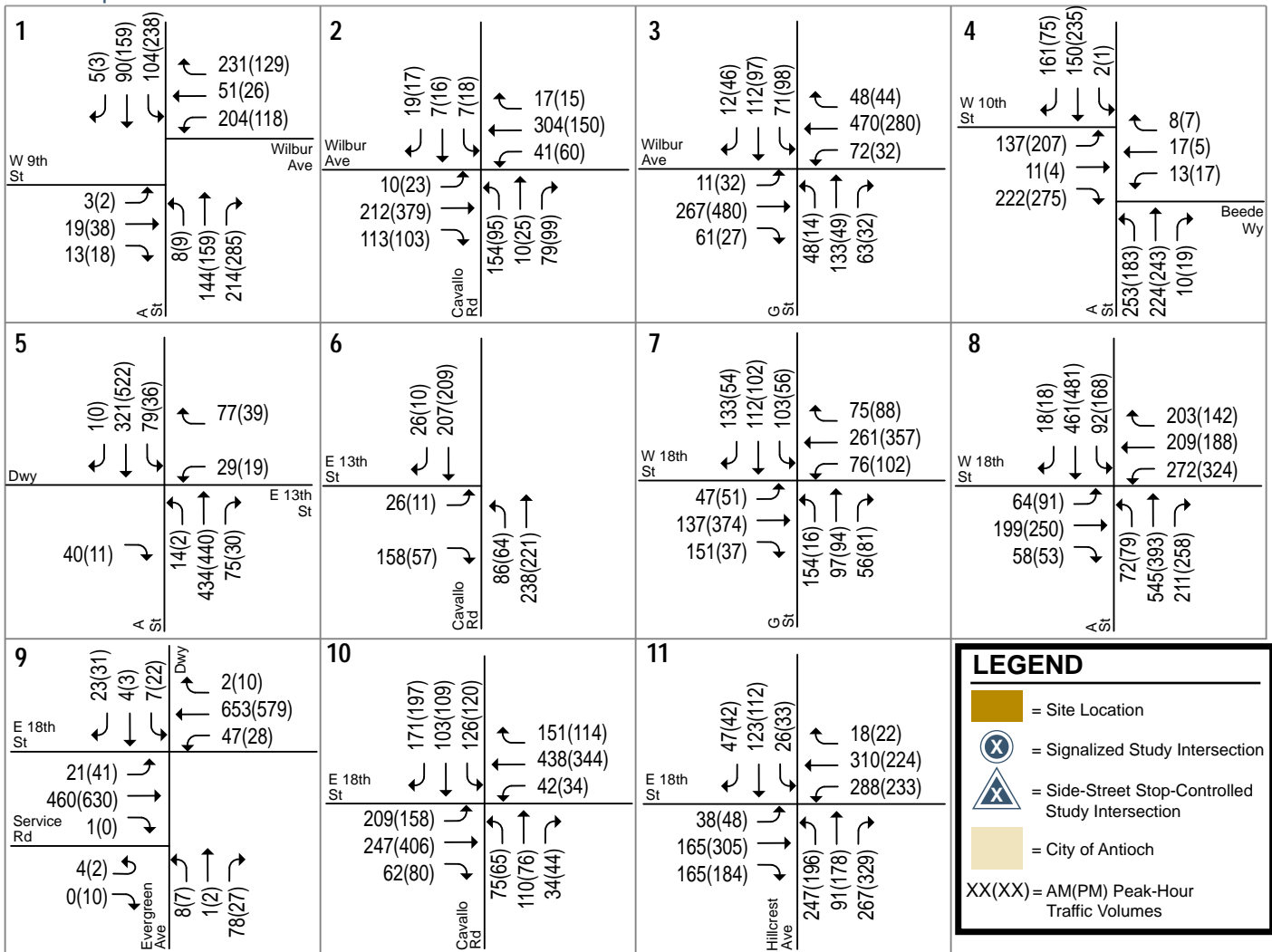
**Figure 7**  
**Project Trip Distribution**

# Rocketship Antioch



**Figure 8**  
**Project Trip Assignment**

Rocketship Antioch



**Figure 9**  
Existing Plus Project Traffic Volumes

**Table 7  
Existing Plus Project Intersection Levels of Service**

Study Number	Intersection	Peak Hour	Control Type	Existing Conditions			
				No Project		With Project	
				Average Delay	LOS	Average Delay	LOS
1	"A" Street and West 9th Street/Wilbur Avenue*	AM	Signal	30.2	C	34.8	C
		PM		35.4	D	36.8	D
2	Cavallo Road and Wilbur Avenue*	AM	Signal	27.9	C	29.1	C
		PM		24.0	C	25.9	C
3	"G" Street and West 10th Street* <sup>2</sup>	AM	Signal	11.5	B	11.9	B
		PM		10.1	B	10.1	B
4	"A" Street and West 10th Street/Beede Way*	AM	Signal	26.7	C	28.0	C
		PM		28.8	C	29.5	C
5	"A" Street and East 13th Street	AM	TWSC <sup>1</sup>	16.1	C	16.6	C
		PM		16.0	C	14.8	B
6	Cavallo Road and East 13th Street	AM	TWSC <sup>1</sup>	10.6	B	12.5	B
		PM		10.3	B	10.8	B
7	"G" Street and West 18th Street* <sup>2</sup>	AM	Signal	20.3	D	21.2	C
		PM		26.1	C	27.0	C
8	"A" Street and East 18th Street* <sup>3</sup>	AM	Signal	40.2	D	42.1	D
		PM		49.2	D	50.2	D
9	Evergreen Avenue and East 18th Street* <sup>3</sup>	AM	Signal	25.0	C	26.1	C
		PM		26.9	C	27.7	C
10	Cavallo Road and East 18th Street*	AM	Signal	22.7	C	26.1	C
		PM		23.3	C	24.6	C
11	Hillcrest Avenue and East 18th Street* <sup>3</sup>	AM	Signal	35.2	D	35.9	D
		PM		39.6	D	40.3	D

**Notes:**

TWSC = Two-Way Stop Control

\* Denotes an intersection on a Route of Regional Significance

<sup>1</sup> For TWSC intersections, the worst approach's delay and level of service are reported.

<sup>2</sup> PM counts were seasonally adjusted to reflect traffic when Antioch schools are in session.

<sup>3</sup> The *Highway Capacity Manual* (HCM) 2010 does not support turning movements with shared and exclusive lanes. Therefore, this intersection was analyzed using the HCM 2000.

**Bold** indicates a substandard level of service.

**Bold** indicates a significant project impact.



## 4. Cumulative Conditions

---

This chapter presents a summary of the traffic conditions that would occur under cumulative conditions with the proposed project. Cumulative conditions represent future traffic conditions with expected growth in the area. Cumulative traffic volumes were estimated using forecasts developed from Contra Costa County's travel demand forecast model. Cumulative conditions reflect a horizon year of 2040.

### Roadway Network and Traffic Volumes

The intersection lane configurations under cumulative conditions were assumed to be the same as described under existing conditions.

Cumulative volumes at the study intersections were estimated based on year 2040 traffic volumes from the County's travel demand forecast model. The County's travel demand forecast model assumes the completion of the upcoming East Contra Costa Bay Area Rapid Transit (eBART) extension, which will add 10 miles of eBART track from the Pittsburg/Bay Point BART Station to a new Antioch station at Hillcrest Avenue. As a result, the travel demand forecast model assumes a shift in mode choice within the Pittsburg/Antioch areas. Trips that currently use arterials streets or SR 4 are expected to access the Hillcrest Avenue eBART station. This shift in mode choice is reflected in the decrease of traffic volumes on selected study area roadways, particularly along "A" Street and West 10<sup>th</sup> Street/Wilbur Avenue. To be conservative, for the intersection approaches where the model estimates traffic volumes to be lower than the existing traffic count, traffic volumes for that approach were assumed to remain the same as under existing conditions.

Cumulative plus project traffic volumes were estimated by adding to the cumulative traffic volumes the additional traffic estimated to be generated by the project. Cumulative plus project conditions were evaluated relative to cumulative conditions to determine potential project impacts. Figures 10 and 11 show the intersection turning-movement volumes under cumulative conditions without and with the project. A tabular summary of project traffic at each study intersection is contained in Appendix B.

Rocketship Antioch

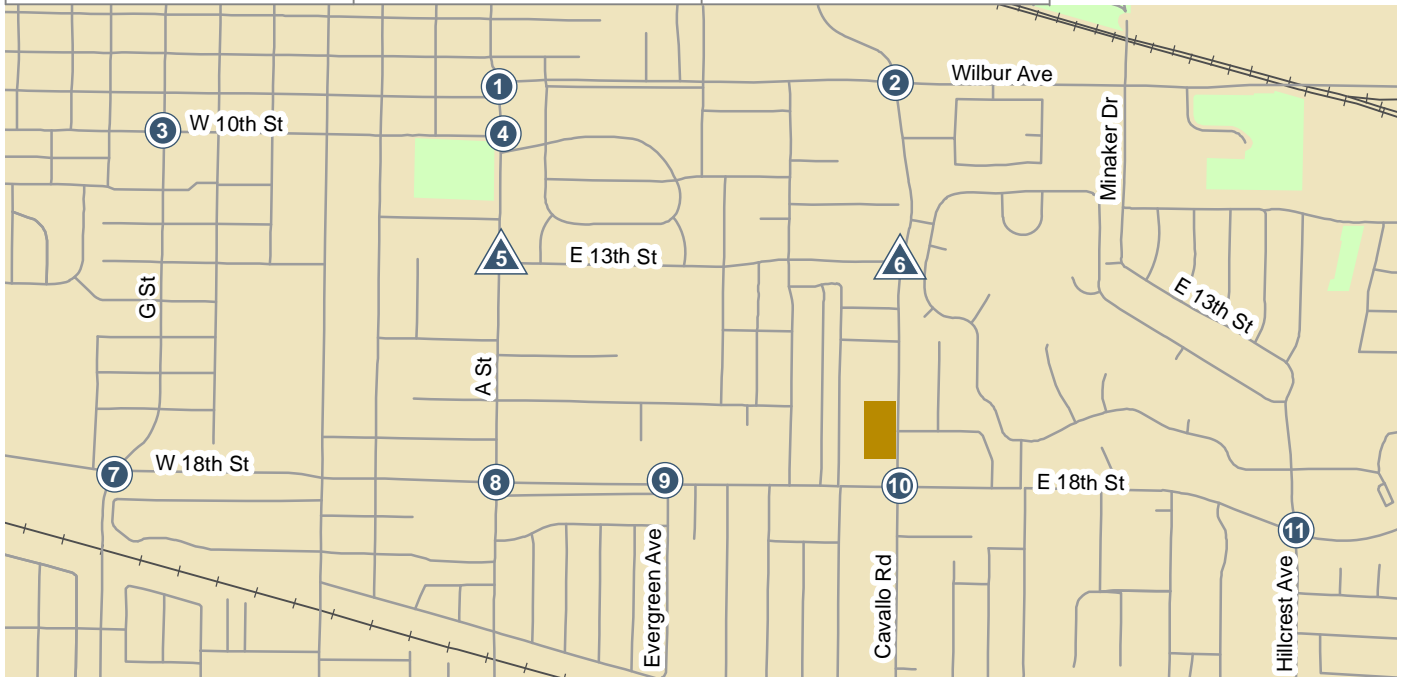
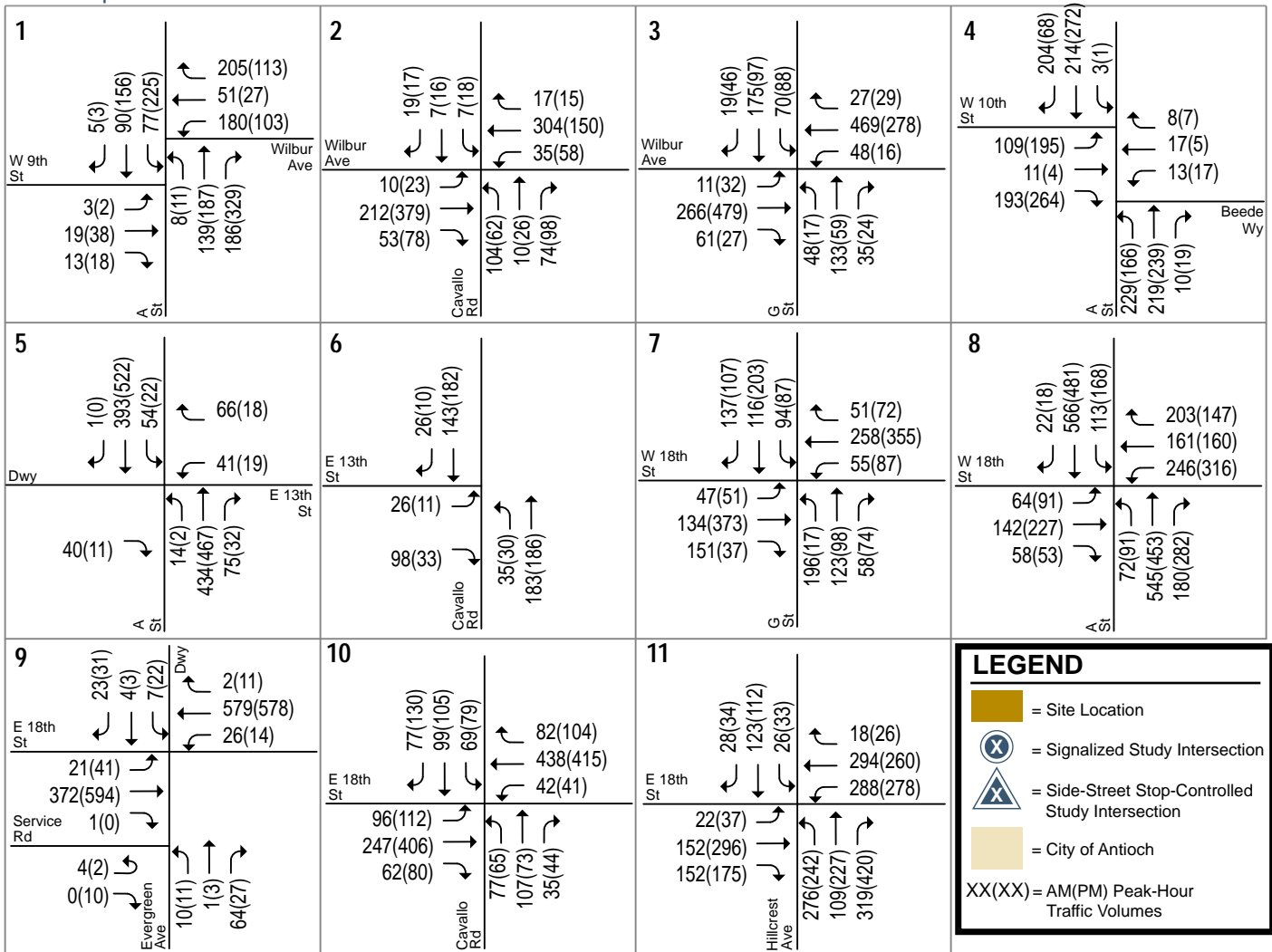


Figure 10  
Cumulative Traffic Volumes

Rocketship Antioch

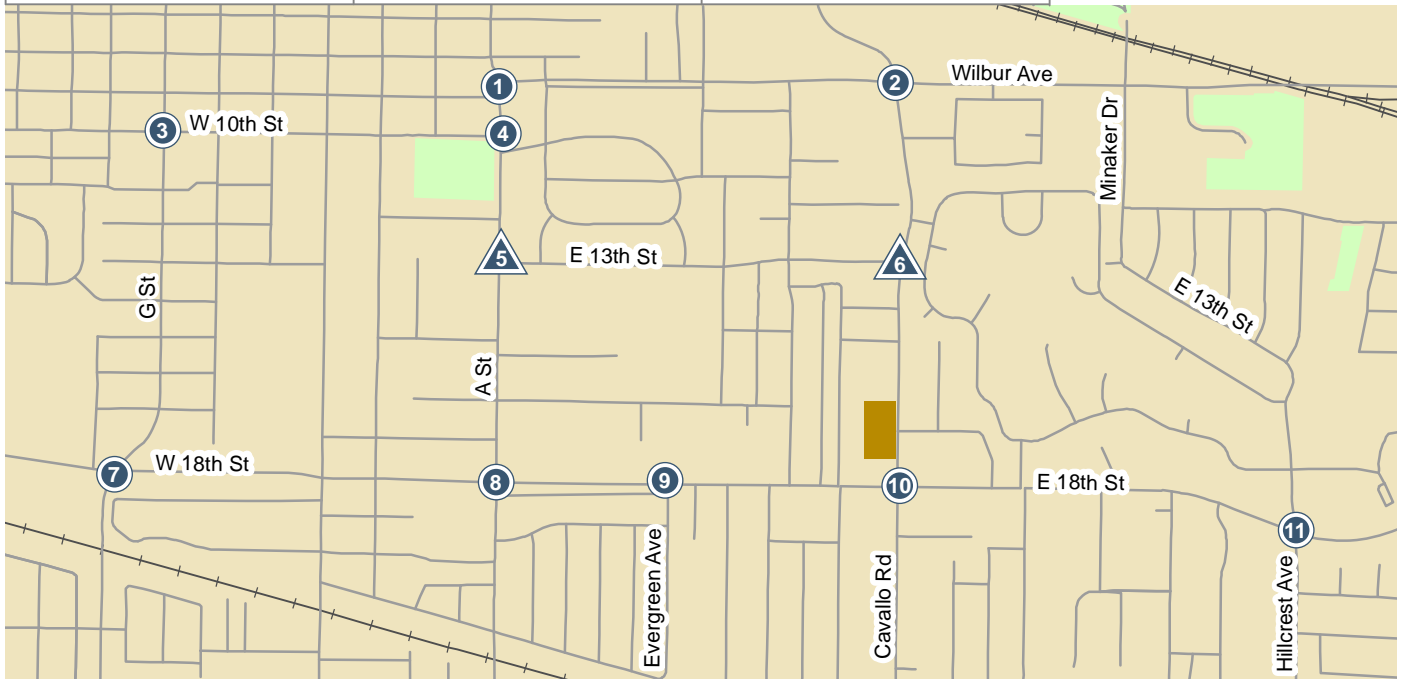
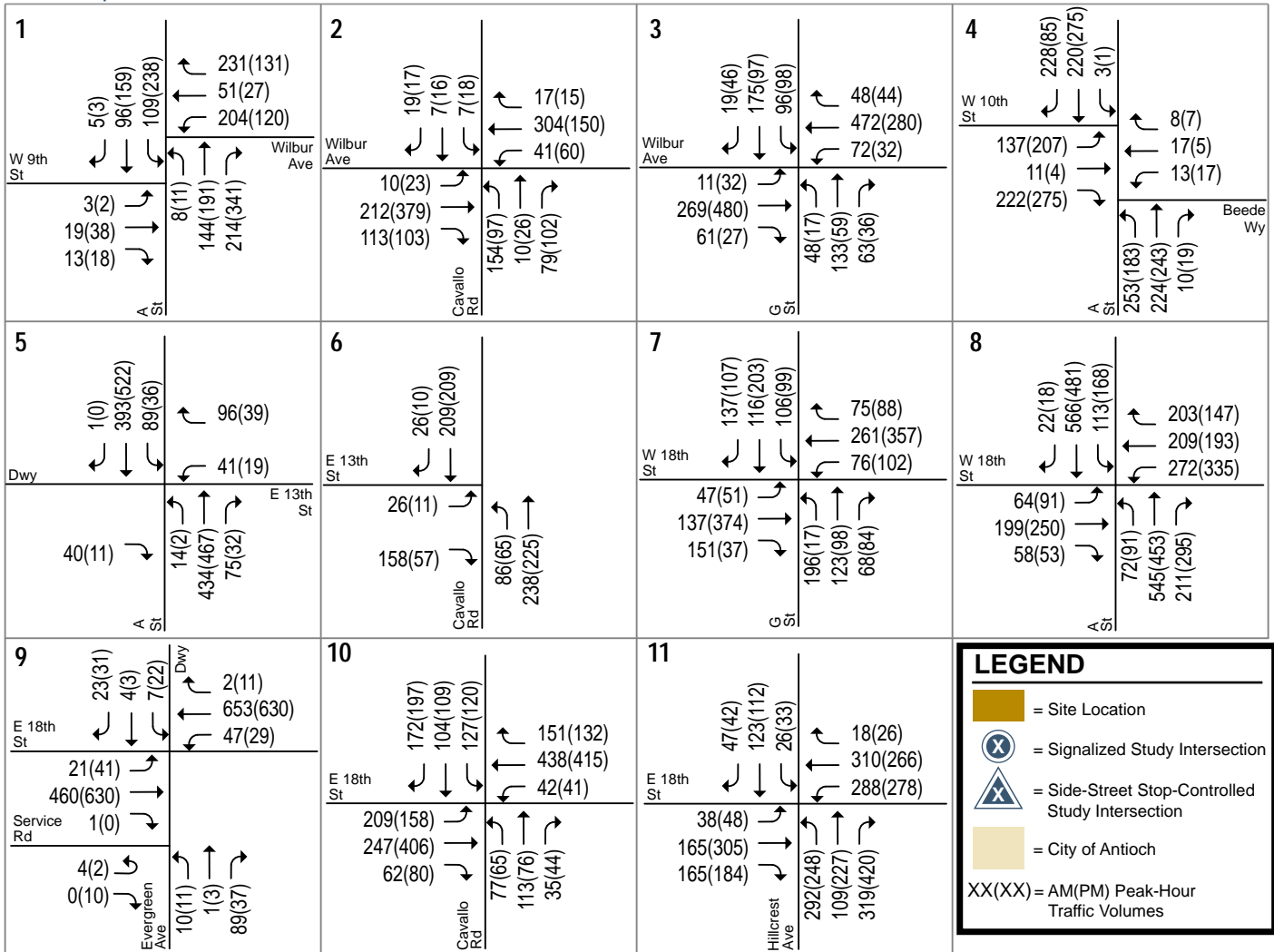


Figure 11  
 Cumulative Plus Project Traffic Volumes

## Intersection Levels of Service Analysis

The results of the level of service analysis under cumulative conditions are summarized in Table 8. The results show that, when measured against the City of Antioch and ECAP level of service standards, all of the signalized study intersections are expected to operate at an acceptable level (high-level LOS D or better) both with and without the proposed project. The intersection level of service calculation sheets are included in Appendix C.

The worst stop-controlled approaches at both unsignalized study intersections would operate at LOS C or better under cumulative plus project conditions during one or both peak hours, which complies with the City’s mid-level LOS D standard for intersections not on a route of regional significance.

**Table 8  
Cumulative Level of Service Summary**

Study Number	Intersection	Peak Hour	Control Type	Cumulative Conditions			
				No Project		With Project	
				Average Delay	LOS	Average Delay	LOS
1	"A" Street and West 9th Street/Wilbur Avenue*	AM	Signal	30.4	C	35.3	D
		PM		38.3	D	40.2	D
2	Cavallo Road and Wilbur Avenue*	AM	Signal	27.9	C	29.1	C
		PM		24.1	C	26.0	C
3	"G" Street and West 10th Street* <sup>2</sup>	AM	Signal	12.4	B	12.9	B
		PM		10.1	B	10.2	B
4	"A" Street and West 10th Street/Beede Way*	AM	Signal	30.9	C	33.2	C
		PM		29.7	C	30.4	C
5	"A" Street and East 13th Street	AM	TWSC <sup>1</sup>	18.9	C	20.7	C
		PM		16.5	C	15.2	C
6	Cavallo Road and East 13th Street	AM	TWSC <sup>1</sup>	10.7	B	12.5	B
		PM		10.3	B	11.0	B
7	"G" Street and West 18th Street* <sup>2</sup>	AM	Signal	22.5	C	23.6	C
		PM		46.7	D	51.2	D
8	"A" Street and East 18th Street* <sup>3</sup>	AM	Signal	40.7	D	42.4	D
		PM		50.0	D	51.1	D
9	Evergreen Avenue and East 18th Street* <sup>3</sup>	AM	Signal	25.2	C	26.2	C
		PM		27.4	C	28.2	C
10	Cavallo Road and East 18th Street*	AM	Signal	22.8	C	26.1	C
		PM		24.2	C	25.5	C
11	Hillcrest Avenue and East 18th Street* <sup>3</sup>	AM	Signal	35.9	C	36.6	D
		PM		40.7	D	41.2	D

**Notes:**

TWSC = Two-Way Stop Control

\* Denotes an intersection on a Route of Regional Significance

<sup>1</sup> For TWSC intersections, the worst approach's delay and level of service are reported.

<sup>2</sup> PM counts were seasonally adjusted to reflect traffic when Antioch schools are in session.

<sup>3</sup> The *Highway Capacity Manual* (HCM) 2010 does not support turning movements with shared and exclusive lanes. Therefore, this intersection was analyzed using the HCM 2000.

**Bold** indicates a substandard level of service.

**Bold** indicates a significant project impact.

## 5. Other Transportation Issues

---

This chapter presents other transportation issues associated with the project. These transportation issues include an analysis of:

- Site access and circulation
- Vehicle queuing
- Potential impacts to transit, bicycle, and pedestrian facilities

Unlike the level of service impact methodology, which is adopted by the City Council, the analyses in this chapter are based on professional judgement in accordance with the standards and methods employed by the traffic engineering community.

### Site Access and On-Site Circulation

This section describes the site access, circulation, and parking for the proposed project. Site access and on-site circulation were evaluated using commonly accepted traffic engineering principles. This review is based on the project site plan labeled “Rocketship Antioch Site Plan” provided by Swift Lee Office on January 17, 2017 (See Figure 2).

### Project Driveway Operations

Site access was evaluated to determine the adequacy of the site’s driveways with regard to the following: traffic volume, delays, vehicle queues, geometric design, and corner sight distance. Vehicular access to the project site would be provided via one full-access driveway and two one-way driveways on Cavallo Road. In addition, the project will have access via the adjacent county parcel. During the peak drop-off and pick-up periods before and after school, parents will enter the northern driveway on the adjacent county parcel and circulate along the western edge of the property before exiting from the one-way, exit-only driveway at the southeastern edge of the project site.

The full-access driveway would be located along the northeastern edge of the project site, and provide access to the northern parking lot. The full-access driveway would have a width of 26 feet. The one-way driveways would be located along the southeastern edge of the project site and provide access to the southern parking lot and egress for vehicles exiting the student loading zone along the western edge of the site. While the entry-only driveway would allow both right and left turns into the site, the exit-only driveway would be restricted to right turns only. Because the traffic volumes on Cavallo Road are moderate and the exit driveway will be restricted to right turns only, delay and queues for exiting vehicles are expected to be minimal. An analysis of the inbound left-turn queue length is provided below. The entry-only and exit-only driveway would have a width of 20 feet and 17 feet, respectively. The City of Antioch requires a minimum of 15 feet for a one-way driveway, and 26 feet for a two-way driveway. Therefore, the project would meet the City’s design standards for driveway widths.

Adequate sight distance should be provided at the project driveways. Adjacent to the project site, there are no roadway curves, on-street parking, or landscaping features that obstruct the vision of exiting drivers. The site plans do not show any landscaping features that would interfere with the sight distance at any of the site driveways. In order to ensure the safety of the students, no objects should be placed within the sight distance triangle that would obstruct the vision of exiting drivers.

### **On-Site Circulation**

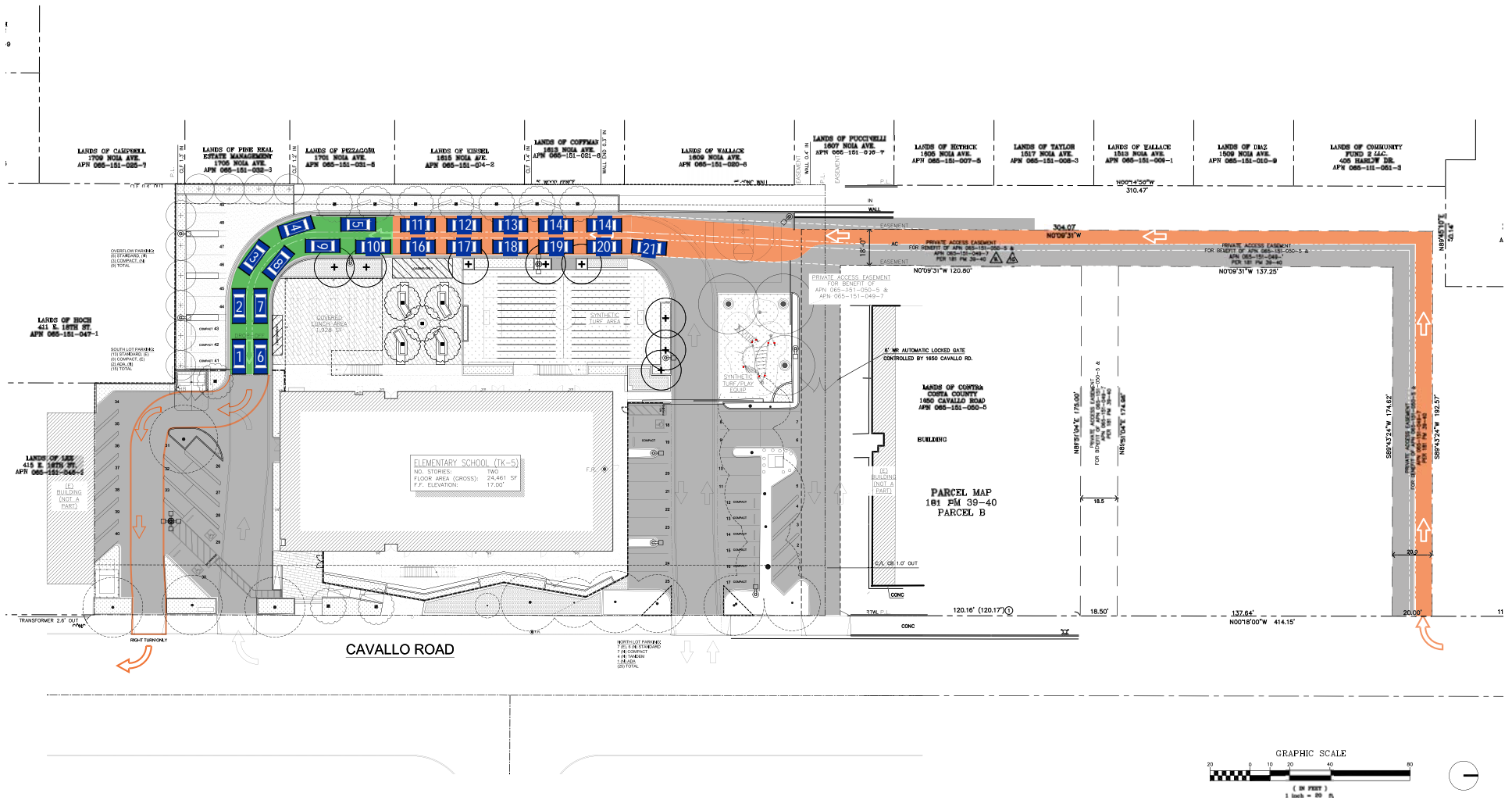
The on-site circulation was reviewed in accordance with the City of Antioch Zoning Code and generally accepted traffic engineering standards. Generally, the proposed plan would provide vehicle traffic with adequate connectivity through the parking areas. During school hours, when the gates to the outdoor play area west of the school building will be closed, the northern parking lot would have a single two-way dead-end drive aisle with 90-degree perpendicular parking spaces. The drive aisle width (26 feet) provides sufficient space for vehicles to back out of the parking stalls. Because there is not sufficient space at the end of the aisle for vehicles to turn around if the lot is full, it is recommended that these parking spaces be reserved for staff parking only. There is four feet between the last parking space at the end of the aisle and the gate, which will facilitate vehicle maneuvers in and out of these parking spaces. The northern parking lot also includes 45-degree angled parking spaces adjacent to a 20-foot drive aisle that would be accessed via the easement through the adjacent county parcel. The site plan also shows four 90-degree tandem spaces within the northern parking lot. It is recommended that these tandem spaces be converted to standard 90-degree spaces with two spaces accessed via the adjacent county parcel and two spaces accessed via the two-way project driveway.

Vehicles traveling within the southern parking area would circulate in a counterclockwise manner from the entrance-only driveway at the northern edge of the lot to the exit-only driveway at the southern edge of the lot. The southern parking lot would provide 45-degree parking adjacent to one-way drive aisles that range from 18 to 25 feet wide. The proposed aisle width meets the City's standards.

The project site also would provide 90-degree parking spaces near the southwest corner of the site adjacent to the student loading zone. Gates will block access to these spaces during the school day, thus they will be used only for overflow parking during events outside regular school hours.

### **Student Drop-off and Pick-up**

Student unloading/loading and queue storage of vehicles waiting to drop-off/pick-up students will occur in the one-way drive aisle along the western edge of the project site. During the peak periods before and after school, parents will access the student loading/unloading zone via the northern driveway on the adjacent county property. Parents will then proceed in a single lane west and then south through the County parking lot before entering the project site via a gate near the basketball court at the northwest corner of the project site. Within the project site, vehicles will be permitted to proceed in either of two lanes along the western edge of the site (See Figure 12). The student loading zone would begin adjacent to the covered lunch area and extend approximately 125 feet in length to the southern exit gate adjacent to the trash enclosure. The student loading zone would allow up to five vehicles in each lane to load simultaneously. School staff or volunteers should direct traffic and place cones in the drive aisles while students unload/load. After all students have cleared the loading zone, staff should remove the cones and allow traffic to move again so that the next 10 vehicles can enter the loading zone. Staff members or parent volunteers should be stationed along the length of the student loading zone to assist students in and out of vehicles and ensure they safely walk to the school. Staff or volunteers should also ensure that parents do not leave their vehicles unattended in the loading zone while they visit the school and direct parents to unload/load students in a timely manner and then exit the loading zone. Parents that need additional time, for example to complete a phone call or to communicate with students before leaving the site should be directed to park in the designated on-site parking spaces to ensure the loading zone is available for its intended purpose.



**LEGEND**

- = Student Loading Zone (125 feet per lane)
- = Estimated Maximum Queue Length (275 feet per lane including vehicles in loading zone)
- = Total Available Queue Storage (1095 feet including loading zone)

**Figure 12**  
**Project Student Drop-Off/Pick-up Circulation**

Furthermore, during the peak student unloading/loading periods, the entry-only driveway at the southern on-site parking lot should be monitored by staff or volunteers to prevent parents from using the parking area as a student unloading/loading zone and to avoid conflicts with vehicles exiting the designated student loading/unloading zone. Staff and/or traffic cones should be positioned adjacent to the exit gate at the end of the student loading/unloading zone to instruct vehicles to merge into one lane and direct traffic flow toward the exit-only driveway. There is approximately 175 feet of space for vehicles to queue in the southern parking lot after exiting the loading zone while waiting to turn out onto Cavallo Road. The queue storage space for outbound vehicle would be sufficient to prevent queues from backing up into the student loading/unloading zone.

School drop-off and pick-up operations and resulting queues were observed at Rocketship Mateo Sheedy Elementary and Rocketship Si Se Puede Academy in San Jose. The length of vehicle queues at the project site was estimated based on our observations at these existing Rocketship schools. The estimates take into account the projected enrollment (600 students) and the length of the student loading zone (125 feet in each of two lanes). It is estimated that 525 feet of queuing space would be needed for drop-off operations and 450 feet of queue storage would be needed for pick-up operations. Longer queues were observed during the morning drop-off period than the afternoon pick-up period because all grades start at the same time in the morning, whereas dismissal times in the afternoon vary by grade level and some students remain on site to participate in after school programs. Including the storage space within and upstream of the student loading/unloading zone and excluding the vehicle stacking space downstream of the loading zone, the site plan shows that on-site queue storage usable for drop-off and pick-up operations would total 650 feet. Thus, drop-off and pick-up queues during the peak periods before and after school are expected to be contained within the project site and not extend onto the County parcel. Nevertheless, approximately 450 of additional queue storage space is available within the easement on the adjacent County property. Thus, queues associated with Rocketship School would not extend on to Cavallo Road.

The drive aisles on the County site range from approximately 30 feet at the northern driveway to 21 feet behind the County building. Given the drive aisle width on the County property and that vehicle queues are not expected to extend beyond the project site, use of the access easement is not expected to substantially affect on-site circulation within the County property.

## Queuing Analysis

The operations analysis is based on vehicle queuing for high-demand movements at intersections. Vehicle queues were estimated using a Poisson probability distribution, which estimates the probability of “n” vehicles for a vehicle movement using the following formula:

$$P(x=n) = \frac{\lambda^n e^{-\lambda}}{n!}$$

Where:

$P(x=n)$  = probability of “n” vehicles in queue per lane

$n$  = number of vehicles in the queue per lane

$\lambda$  = average number of vehicles in the queue per lane (vehicles per hour per lane/signal cycles per hour)

The basis of the analysis is as follows: (1) the Poisson probability distribution is used to estimate the 95<sup>th</sup> percentile maximum number of queued vehicles per signal cycle for a particular movement; (2) the estimated maximum number of vehicles in the queue is translated into a queue length, assuming 25



feet per vehicle; and (3) the estimated maximum queue length is compared to the existing or planned available storage capacity for the movement.

The following ten left-turn movements were examined as part of the queuing analysis for this project:

- Southbound and westbound left turn at “A” Street and West 9<sup>th</sup> Street/Wilbur Avenue
- Northbound left turn at Cavallo Road and Wilbur Avenue
- Northbound left turn at “A” Street and West 10<sup>th</sup> Street/Beede Way
- Northbound left turn at Cavallo Road and East 13<sup>th</sup> Street
- Westbound left-turn/through movement at “A” Street and East 18<sup>th</sup> Street
- Eastbound and southbound left turn at Cavallo Road and East 18<sup>th</sup> Street
- Northbound left-turn/through movement at Hillcrest Avenue and East 18<sup>th</sup> Street
- Northbound left turn at Cavallo Road and County Driveway

At the intersection of “A” Street and East 18<sup>th</sup> Street, the westbound left-turn movement consists of one left-turn lane and one shared left-turn/through lane. Given that the left-turn and through movements are combined in a shared lane, the queue analysis on this approach reflects both the left-turn and through movements. Similarly, the queuing analysis on the northbound Hillcrest Avenue approach to East 18<sup>th</sup> Street reflects both the left-turn and through movements as they share a travel lane. The estimated queue lengths based on the Poisson numerical calculations show queuing deficiencies at two locations (see Table 9).

### **“A” Street and West 10<sup>th</sup> Street/Beede Way**

At the “A” Street and West 10<sup>th</sup> Street/Beede Way intersection, the 95<sup>th</sup> percentile queue for the northbound left turn currently exceeds the existing turn pocket storage capacity by 60 feet, or two vehicles during the AM peak hour, and by 10 feet (less than one vehicle) during the PM peak hour. Field observations, however, did not show any instances where this queue exceeded the available storage. Under cumulative conditions, the 95<sup>th</sup> percentile queue is expected to continue to exceed the storage capacity by 60 feet and 10 feet during the AM and PM peak hours, respectively. With the additional trips added by the Rocketship School project, the 95<sup>th</sup> percentile queue would increase by one vehicle during both peak hours. The small increase in queue length would have a negligible effect on traffic operations at this intersection because the left-turn spillback would be expected to last for only a few seconds during only one signal cycle in the AM and PM peak hours. Therefore, no improvements are recommended.

### **Cavallo Road and East 18<sup>th</sup> Street**

The eastbound left-turn pocket at the Cavallo Road and East 18<sup>th</sup> Street intersection currently provides sufficient storage for the existing queues during both the AM and PM peak hours. With the additional trips added by the Rocketship School project, the 95<sup>th</sup> percentile queue will increase by 75 feet and 50 feet, or three vehicles and two vehicles, during the AM and PM peak hours, respectively. The increase in queue length would exceed the existing turn pocket storage, possibly causing some left-turn vehicles to queue in the adjacent through lane while waiting to enter the left-turn pocket. Because East 18<sup>th</sup> Street has two through lanes in each direction, through traffic could continue to proceed in the curb lane if the inner through lane is blocked by left-turn traffic. The queue spillover would have an insignificant effect on traffic operations at this intersection because the spillover would occur for only a few seconds during only some signal cycles during the peak hours before and after school, and the left-turn queue is expected to completely dissipate during each signal cycle. Furthermore, the intersection would continue to operate at LOS C even if eastbound through traffic were reduced to the use of a single lane for the entire hour. Nevertheless, median striping modifications are recommended to encourage eastbound left-turn queues to extend into the center turn lane if necessary (see Figure 13). The

modification would remove the left-turn pocket taper striping to increase the queue storage available for use by eastbound left-turn traffic while still accommodating the existing left turns to and from adjacent driveways and Woodland Drive.

### **Hillcrest Avenue and East 18<sup>th</sup> Street**

At the Hillcrest Avenue and East 18<sup>th</sup> Street intersection, the 95<sup>th</sup> percentile queue for the northbound left-turn/through movements is expected to exceed the existing turn pocket storage capacity by 90 feet during the PM peak hour under cumulative conditions. The additional trips added by the Rocketship School project are not expected to increase the 95<sup>th</sup> percentile queue. Therefore, the project is not required to implement improvements at this intersection.

**Table 9**  
**Queuing Analysis Summary**

Measurement	"A" Street and West 9th Street/Wilbur Avenue				Cavallo Road and Wilbur Avenue		"A" Street and West 10th Street/Beede Way		Cavallo Road and East 13th Street		"A" Street and East 18th Street		Cavallo Road and East 18th Street				Hillcrest Avenue and East 18th Street		Cavallo Road and County Driveway	
	SBL		WBL/WBTH		NBL		NBL		NBL		WBT/WBL		EBL		SBL		NBL/NBT		NBL	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
<b>Existing</b>																				
Cycle/Delay <sup>1</sup> (sec)	72	95	72	95	115	75	90	100	10.3	10.0	120	135	80	80	80	80	105	115	7.9	8.0
Total Volume	72	225	231	127	104	60	229	166	35	29	407	460	96	112	68	79	322	368	82	24
Total Avg. Queue (veh.)	0.7	1.2	4.6	3.4	3.3	1.3	5.7	4.6	0.1	0.1	13.6	17.3	2.1	2.5	1.5	1.8	9.4	11.8	0.2	0.1
Total Avg. Queue <sup>2</sup> (ft.)	18	30	116	84	83	31	143	115	3	2	339	431	53	62	38	44	235	294	4	1
Total 95th % Queue (veh.)	2	3	8	7	7	3	10	8	1	1	20	24	5	5	4	4	15	18	1	0
Total 95th % Queue (ft.)	50	75	200	175	175	75	250	200	25	25	500	600	125	125	100	100	375	450	25	0
Total Storage (ft.)	75	75	250	250	275	275	190	190	150	150	1325	1325	125	125	150	150	460	460	410	410
Adequate (Y/N)	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<b>Existing Plus Project</b>																				
Cycle/Delay <sup>1</sup> (sec)	72	95	72	95	115	75	90	100	11.7	10.4	120	135	80	80	80	80	105	115	9.8	8.7
Total Volume	104	238	255	144	154	95	253	183	86	64	481	512	209	158	126	120	338	374	270	101
Total Avg. Queue (veh.)	1.0	1.3	5.1	3.8	4.9	2.0	6.3	5.1	0.3	0.2	16.0	19.2	4.6	3.5	2.8	2.7	9.9	11.9	0.7	0.2
Total Avg. Queue <sup>2</sup> (ft.)	26	31	128	95	123	49	158	127	7	5	401	480	116	88	70	67	246	299	18	6
Total 95th % Queue (veh.)	3	3	9	7	9	5	11	9	1	1	23	27	8	7	6	6	15	18	2	1
Total 95th % Queue (ft.)	75	75	225	175	225	125	275	225	25	25	575	675	200	175	150	150	375	450	50	25
Total Storage (ft.)	75	75	250	250	275	275	190	190	150	150	1325	1325	125	125	150	150	460	460	410	410
Adequate (Y/N)	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
<b>Cumulative</b>																				
Cycle/Delay <sup>1</sup> (sec)	72	95	72	95	115	75	90	100	10.3	10.1	120	135	80	80	80	80	105	115	8.0	8.0
Total Volume	77	225	231	130	104	62	229	166	35	30	407	476	96	112	69	79	385	469	82	24
Total Avg. Queue (veh.)	0.8	1.2	4.6	3.4	3.3	1.3	5.7	4.6	0.1	0.1	13.6	17.9	2.1	2.5	1.5	1.8	11.2	15.0	0.2	0.1
Total Avg. Queue <sup>2</sup> (ft.)	19	30	116	86	83	32	143	115	3	2	339	446	53	62	38	44	281	375	5	1
Total 95th % Queue (veh.)	2	3	8	5	5	3	10	8	1	1	20	25	5	5	4	4	17	22	1	0
Total 95th % Queue (ft.)	50	75	200	125	125	75	250	200	25	25	500	625	125	125	100	100	425	550	25	0
Total Storage (ft.)	75	75	250	250	275	275	190	190	150	150	1325	1325	125	125	150	150	460	460	410	410
Adequate (Y/N)	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
<b>Cumulative Plus Project</b>																				
Cycle/Delay <sup>1</sup> (sec)	72	95	72	95	115	75	90	100	11.7	10.4	120	135	80	80	80	80	105	115	9.8	8.7
Total Volume	109	238	255	147	154	97	253	183	86	65	481	528	209	158	127	120	401	475	270	101
Total Avg. Queue (veh.)	1.1	1.3	5.1	3.9	4.9	2.0	6.3	5.1	0.3	0.2	16.0	19.8	4.6	3.5	2.8	2.7	11.7	15.2	0.7	0.2
Total Avg. Queue <sup>2</sup> (ft.)	27	31	128	97	123	51	158	127	7	5	401	495	116	88	71	67	292	379	18	6
Total 95th % Queue (veh.)	3	3	9	5	9	5	11	9	1	1	23	27	8	7	6	6	18	22	2	1
Total 95th % Queue (ft.)	75	75	225	125	225	125	275	225	25	25	575	675	200	175	150	150	450	550	50	25
Total Storage (ft.)	75	75	250	250	275	275	190	190	150	150	1325	1325	125	125	150	150	460	460	410	410
Adequate (Y/N)	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	N	N	Y	Y	Y	N	Y	Y

Notes:  
<sup>1</sup> Vehicle queue calculations based on cycle length for signalized intersections.  
<sup>2</sup> Assumes 25 Feet Per Vehicle

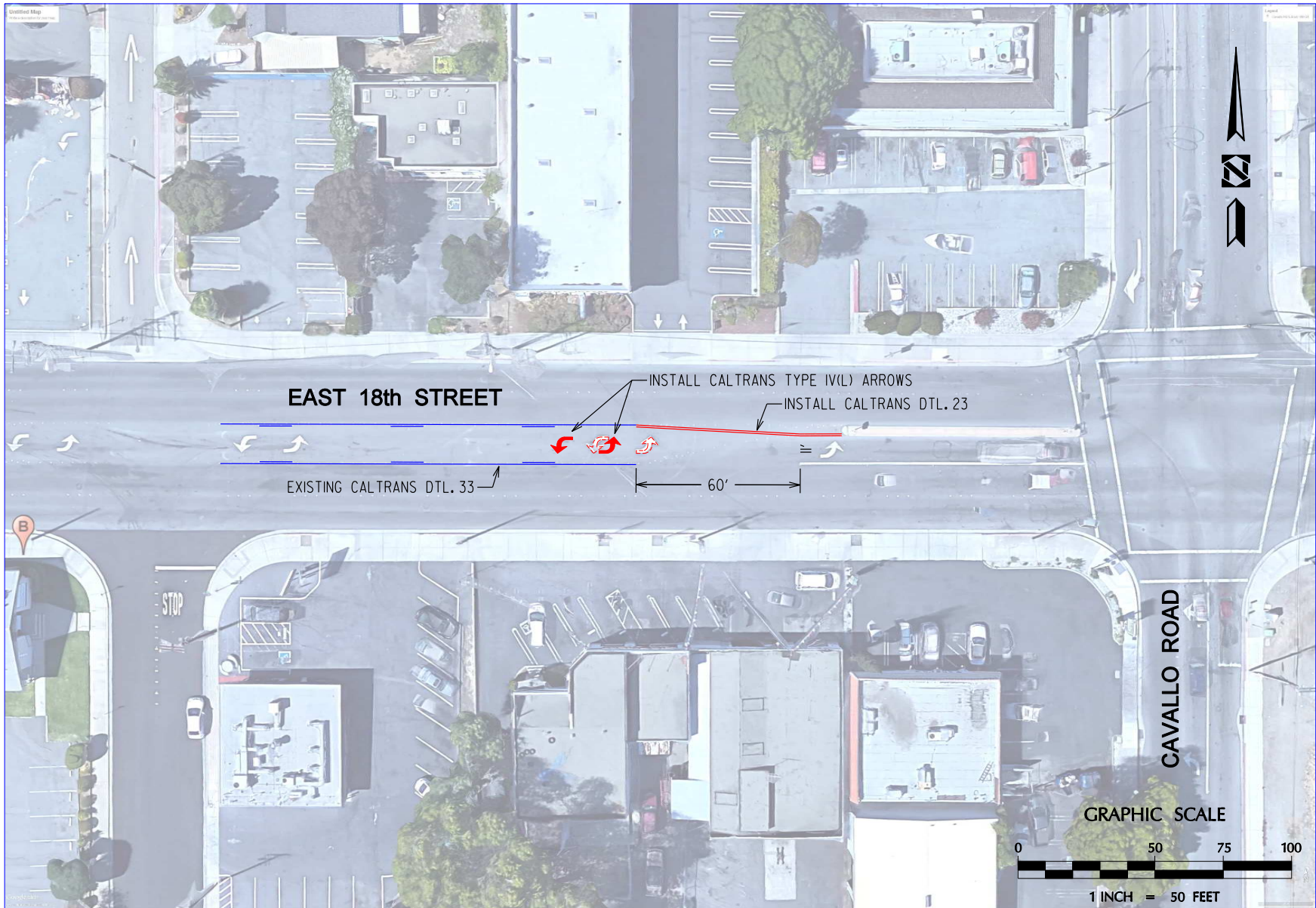


Figure 13  
Recommended Median Restriping on East 18th Street at Cavallo Road

The existing turn storage is expected to be sufficient to accommodate the 95<sup>th</sup> percentile queue length for all other locations including the left-turn movement from northbound Cavallo Road into the adjacent County property, which would be used by parents dropping off and picking up students during the peak hours before and after school.

## Transit, Pedestrian, and Bicycle Analysis

Transit in the study area is provided by Tri Delta Transit. The study area is served directly by eight local bus routes, three of which provide service within a ½ mile of the project site: Local Route 380, Local Route 387, and Local Route 388. Combined, these routes provide service between the Pittsburg/Bay Point BART Station, Deer Valley Kaiser Medical Center, and the Tri Delta Transit Station (see Chapter 2 for detailed discussion). The 2015 U.S. Census reports that bus trips comprise approximately 7.5% of the total commute mode share in the City of Antioch. Assuming the same mode split for the proposed project, this would equate to 43 transit trips during the AM and 24 transit trips during the PM peak commute hours. According to the Tri Delta Short Range Transit Plan, the capacity of their bus fleet ranges between 44 and 56 seats per vehicle. With one or two bus trips in each direction on every route during commute hours, and given that the estimated transit volume of riders would be dispersed among the different routes, the project-generated riders would not exceed the carrying capacity of the existing bus service near the project site.

Pedestrian facilities in the study area consist of sidewalks located on both sides of Cavallo Road and other nearby neighborhood roadways (e.g., East 13<sup>th</sup> Street, Noia Avenue, East 14<sup>th</sup> Street) in the vicinity of the project. Pedestrian travel to and from the project site is also aided by marked crosswalks with pedestrian signal heads and push buttons at all but one approach at the signalized study intersections, and marked crosswalks along all stop-controlled approaches at unsignalized study intersections. Although one crosswalk connection is missing, the overall network of sidewalks and crosswalks in the study area has good connectivity and provides pedestrians with safe routes to the proposed school, nearby transit stops, and other points of interest in the vicinity of the project site.

Bicycle lanes are present on portions of Wilbur Avenue, on Cavallo Road, Hillcrest Avenue, and Lake Drive. Although none of the adjacent residential streets have striped bike lanes, the low traffic volumes make these roadways conducive to bicycle traffic. In addition, bikes and pedestrians could also use the Delta de Anza Regional Trail, which connects to Hillcrest Avenue. The sidewalks and bikeways in the school vicinity are adequate to serve students who may walk or bike to school.

## 6. Conclusions

---

The potential impacts of the project were evaluated in accordance with the standards set forth by the City of Antioch, Contra Costa Transportation Authority (CCTA) Congestion Management Program (CMP), and the East County Action Plan (ECAP). The traffic study includes an analysis of AM and PM peak hour traffic conditions for nine signalized intersections and two unsignalized intersection in the vicinity of the project site. The analysis focuses on the peak commute periods between 7:00 and 9:00 AM and between 4:00 and 6:00 PM, because it is during these hours that traffic conditions on the surrounding roadways are generally the most congested.

### Intersection Level of Service Analysis

The analysis determined that under all scenarios with and without the project, when measured against the City of Antioch and ECAP level of service standards, all of the study intersections are expected to operate at acceptable levels (high-level LOS D or better). In addition, under all scenarios with and without the project, the worst stop-controlled approaches at the unsignalized study intersections would operate at LOS C or better during one or both peak hours, which complies with the City's mid-level LOS D standard for intersections not on a route of regional significance. Therefore, the project would not result in a significant impact on intersection levels of service.

### Other Transportation Issues

According to the 2013 Contra Costa County CMP *Technical Procedures*, the proposed project would not have an adverse effect on the existing transit, pedestrian, or bicycle facilities in the study area.

Based on a review of the project site plan, Hexagon has provided the following recommendations to improve site access, and on-site circulation.

#### Recommendations

- The northern parking lot should be reserved for staff parking only, given that there is not sufficient space at the end of the aisle for vehicles to turn around if the lot is full.
- The four 90-degree tandem spaces within the northern parking lot should be converted to standard 90-degree spaces with two spaces accessed via the adjacent county parcel and two spaces accessed via the project driveway.
- During student unloading/loading periods, school staff or volunteers should direct traffic and place cones in the drive aisles while students unload/load. After all students have cleared the loading zone, staff should remove the cones and allow traffic to move again so that the next 10

vehicles can enter the loading zone. Staff members or parent volunteers should be stationed along the length of the student loading zone to assist students in and out of vehicles and ensure they safely walk to the school. Staff or volunteers should also ensure that parents do not leave their vehicles unattended in the loading zone while they visit the school and direct parents to unload/load students in a timely manner and then exit the loading zone. Parents that need additional time, for example to complete a phone call or to communicate with students before leaving the site should be directed to park in the designated on-site parking spaces to ensure the loading zone is available for its intended purpose.

- During the student unloading/loading periods, the entry-only driveway at the southern on-site parking lot should be monitored by staff or volunteers to prevent parents from using the parking area as a student unloading/loading zone and to avoid conflicts with vehicles exiting the designated student loading/unloading zone. Staff and/or traffic cones should be positioned adjacent to the exit gate at the end of the student loading/unloading zone to instruct vehicles to merge into one lane and direct traffic flow toward the exit-only driveway.
- At the Cavallo Road/East 18<sup>th</sup> Street intersection, the additional trips added by the proposed Rocketship School would increase the eastbound 95<sup>th</sup> percentile left-turn queue by 75 feet and 50 feet, or three vehicles and two vehicles, during the AM and PM peak hours, respectively. The increase in queue length would exceed the existing turn pocket storage, possibly causing some left-turn vehicles to queue in the adjacent through lane while waiting to enter the left-turn pocket. Because East 18th Street has two through lanes in each direction, through traffic could continue to proceed in the curb lane if the inner through lane is blocked by left-turn traffic. The queue spillover would have an insignificant effect on traffic operations at this intersection because the spillover would occur for only a few seconds during only some signal cycles during the peak hours before and after school, and the left-turn queue is expected to completely dissipate during each signal cycle. Furthermore, the intersection would continue to operate at LOS C even if eastbound through traffic were reduced to the use of a single lane for the entire hour. Nevertheless, median striping modifications are recommended to encourage eastbound left-turn queues to extend into the center turn lane if necessary. The modification would remove the left-turn pocket taper striping to increase the queue storage available for use by eastbound left-turn traffic while still accommodating the existing left turns to and from adjacent driveways and Woodland Drive.

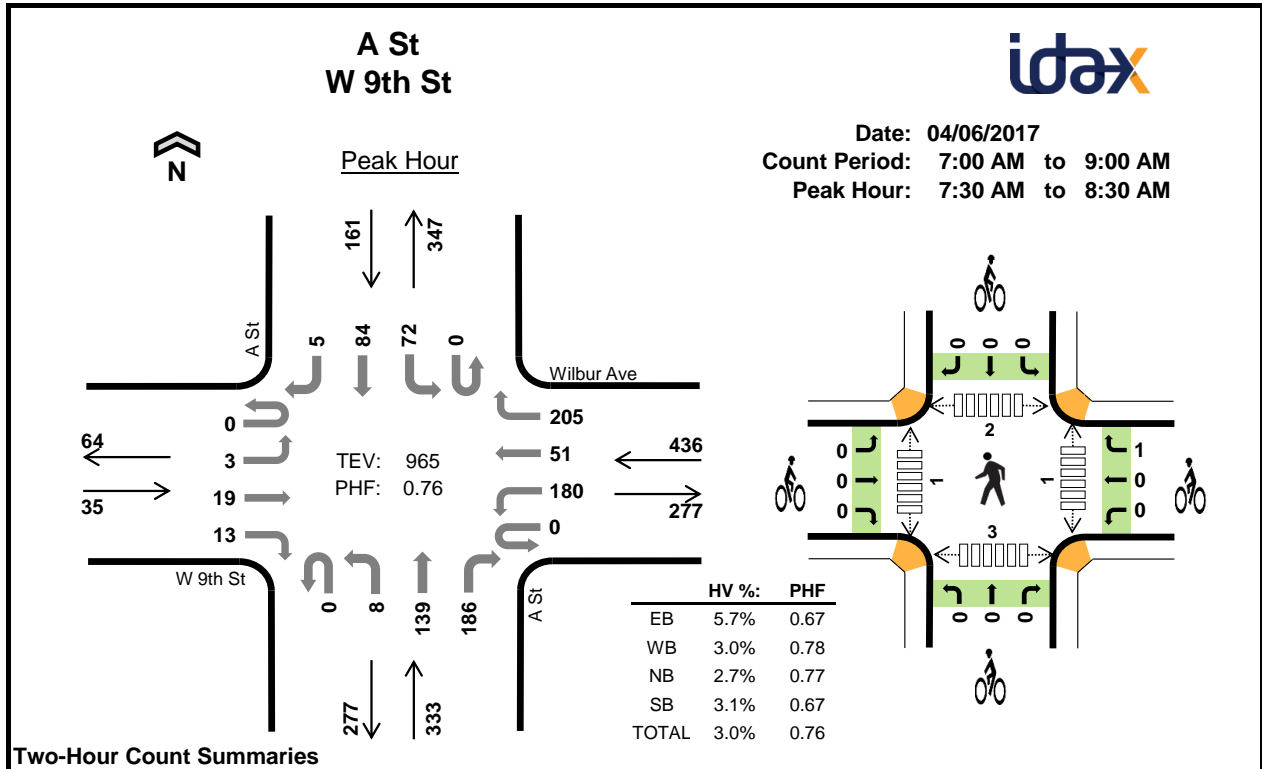
**Antioch Rocketship School TIA  
Technical Appendices**

August 1, 2017



# **Appendix A**

## **Traffic Counts**



**Two-Hour Count Summaries**

Interval Start	W 9th St				Wilbur Ave				A St				A St				15-min Total	Rolling One Hour	
	Eastbound		RT		Westbound		RT		Northbound		RT		Southbound		RT				
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
7:00 AM	0	0	0	2	0	38	5	22	0	1	19	13	0	7	13	1	121	0	
7:15 AM	0	0	2	1	0	49	6	37	0	2	19	21	0	8	21	0	166	0	
7:30 AM	0	0	3	4	0	56	14	44	0	1	27	32	0	21	21	0	223	0	
7:45 AM	0	0	8	4	0	61	14	64	0	4	35	69	0	30	26	4	319	829	
8:00 AM	0	2	6	5	0	35	17	50	0	2	36	53	0	13	20	1	240	948	
8:15 AM	0	1	2	0	0	28	6	47	0	1	41	32	0	8	17	0	183	965	
8:30 AM	0	0	3	2	0	25	3	34	0	2	40	33	0	18	24	1	185	927	
8:45 AM	0	0	6	4	0	35	5	43	0	3	48	26	0	17	14	3	204	812	
Count Total	0	3	30	22	0	327	70	341	0	16	265	279	0	122	156	10	1,641	0	
Peak Hour	All	0	3	19	13	0	180	51	205	0	8	139	186	0	72	84	5	965	0
	HV	0	0	2	0	0	9	1	3	0	0	1	8	0	2	1	2	29	0
	HV%	-	0%	11%	0%	-	5%	2%	1%	-	0%	1%	4%	-	3%	1%	40%	3%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

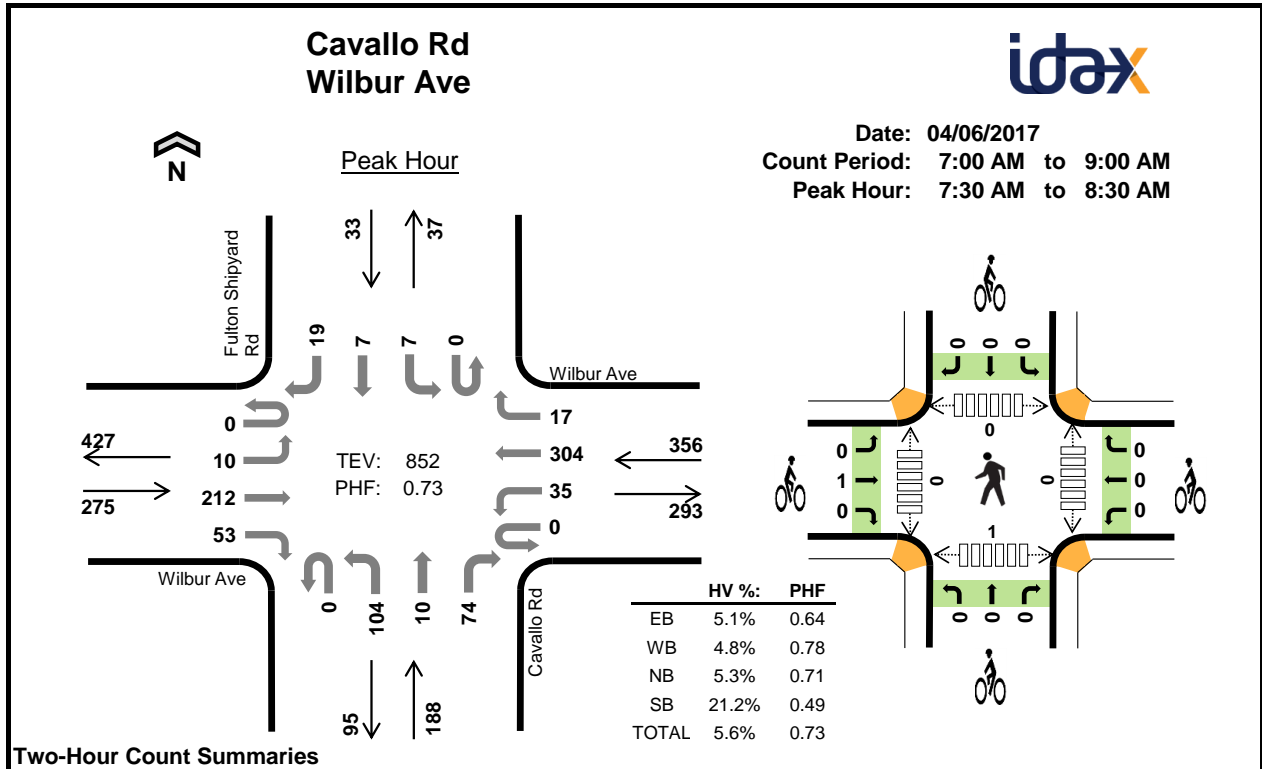
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	4	2	0	6	0	0	0	0	0	1	0	0	0	1
7:15 AM	1	3	2	0	6	0	0	0	2	2	0	1	1	2	4
7:30 AM	0	3	1	2	6	0	0	0	0	0	1	1	2	2	6
7:45 AM	0	3	3	2	8	0	1	0	0	1	0	0	0	0	0
8:00 AM	1	4	2	1	8	0	0	0	0	0	0	0	0	1	1
8:15 AM	1	3	3	0	7	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	4	3	2	9	0	0	0	0	0	3	2	0	1	6
8:45 AM	0	2	1	1	4	0	0	0	0	0	1	1	0	1	3
Count Total	3	26	17	8	54	0	1	0	2	3	6	5	3	7	21
Peak Hour	2	13	9	5	29	0	1	0	0	1	1	1	2	3	7

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	W 9th St				Wilbur Ave				A St				A St				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	2	0	2	0	0	1	1	0	0	0	0	6	0
7:15 AM	0	0	1	0	0	2	0	1	0	0	1	1	0	0	0	0	6	0
7:30 AM	0	0	0	0	0	3	0	0	0	0	0	1	0	1	1	0	6	0
7:45 AM	0	0	0	0	0	2	0	1	0	0	0	3	0	1	0	1	8	26
8:00 AM	0	0	1	0	0	2	0	2	0	0	1	1	0	0	0	1	8	28
8:15 AM	0	0	1	0	0	2	1	0	0	0	0	3	0	0	0	0	7	29
8:30 AM	0	0	0	0	0	3	0	1	0	0	0	3	0	1	1	0	9	32
8:45 AM	0	0	0	0	0	2	0	0	0	0	1	0	0	1	0	0	4	28
Count Total	0	0	3	0	0	18	1	7	0	0	4	13	0	4	2	2	54	0
Peak Hour	0	0	2	0	0	9	1	3	0	0	1	8	0	2	1	2	29	0

Two-Hour Count Summaries - Bikes														
Interval Start	W 9th St			Wilbur Ave			A St			A St			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	1	2	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	1	3
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	1	0	0	0	0	1	1	3	0
Peak Hour	0	0	0	0	0	1	0	0	0	0	0	0	1	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.



**Two-Hour Count Summaries**

Interval Start	Wilbur Ave Eastbound				Wilbur Ave Westbound				Cavallo Rd Northbound				Fulton Shipyard Rd Southbound				15-min Total	Rolling One Hour	
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
7:00 AM	0	1	16	3	0	8	51	2	0	10	0	4	0	0	1	1	97	0	
7:15 AM	0	2	22	3	0	5	69	5	0	19	1	11	0	0	1	2	140	0	
7:30 AM	0	3	36	12	0	7	78	3	0	23	2	16	0	1	1	2	184	0	
7:45 AM	0	1	89	17	0	11	97	6	0	37	3	26	0	1	0	3	291	712	
8:00 AM	0	2	64	16	0	10	68	4	0	30	0	13	0	0	2	6	215	830	
8:15 AM	0	4	23	8	0	7	61	4	0	14	5	19	0	5	4	8	162	852	
8:30 AM	0	8	30	6	0	10	40	3	0	23	2	19	0	0	0	2	143	811	
8:45 AM	0	6	27	7	0	7	52	4	0	23	3	8	0	1	2	5	145	665	
Count Total	0	27	307	72	0	65	516	31	0	179	16	116	0	8	11	29	1,377	0	
Peak Hour	All	0	10	212	53	0	35	304	17	0	104	10	74	0	7	7	19	852	0
	HV	0	1	10	3	0	5	11	1	0	2	0	8	0	2	1	4	48	0
	HV%	-	10%	5%	6%	-	14%	4%	6%	-	2%	0%	11%	-	29%	14%	21%	6%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

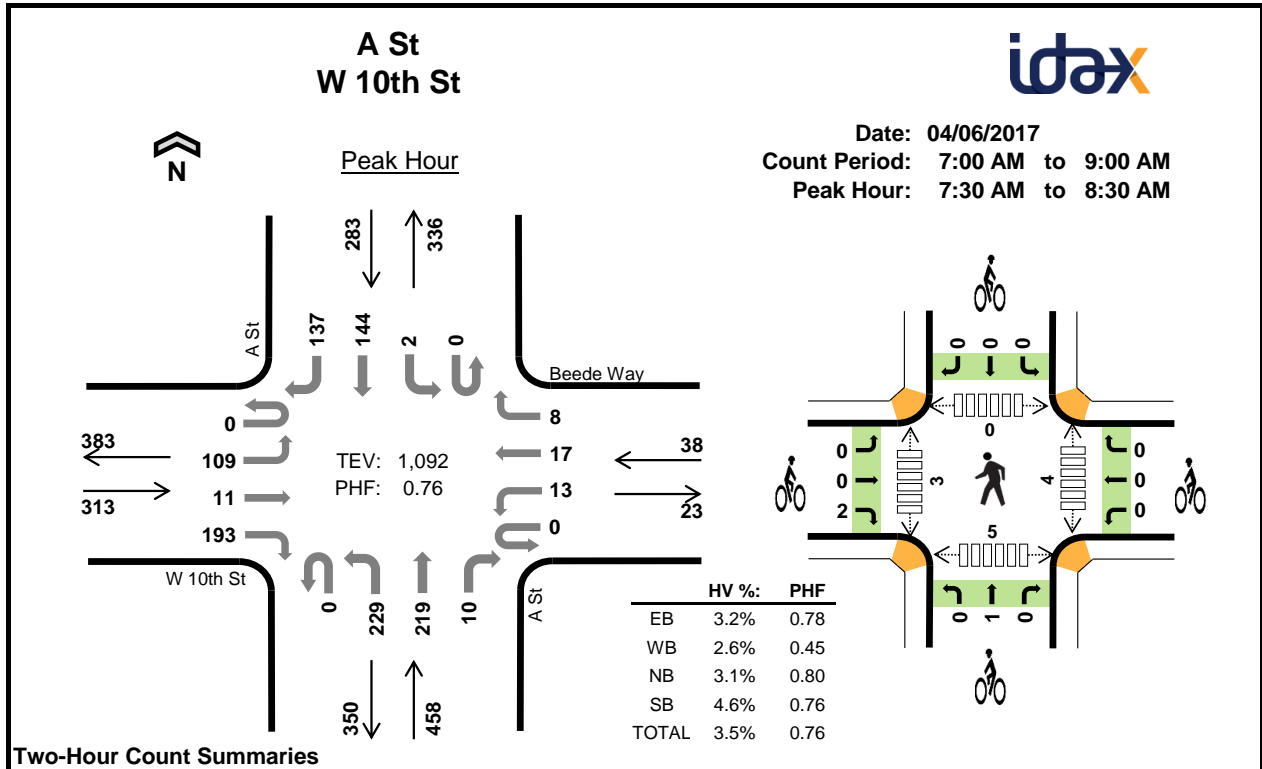
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	9	1	0	11	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	4	1	1	6	0	0	0	0	0	1	0	1	0	2
7:30 AM	3	4	1	0	8	0	0	0	0	0	0	0	0	0	0
7:45 AM	5	5	5	2	17	0	0	0	0	0	0	0	0	0	0
8:00 AM	3	4	3	1	11	0	0	0	0	0	0	0	0	0	0
8:15 AM	3	4	1	4	12	1	0	0	0	1	0	0	0	1	1
8:30 AM	6	9	7	0	22	0	0	0	0	0	0	0	0	0	0
8:45 AM	3	3	7	3	16	1	0	0	0	1	0	0	0	0	0
Count Total	24	42	26	11	103	2	0	0	0	2	1	0	1	1	3
Peak Hour	14	17	10	7	48	1	0	0	0	1	0	0	0	1	1

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	Wilbur Ave				Wilbur Ave				Cavallo Rd				Fulton Shipyard Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	1	0	0	5	3	1	0	0	0	1	0	0	0	0	11	0
7:15 AM	0	0	0	0	0	2	2	0	0	0	0	1	0	0	0	1	6	0
7:30 AM	0	1	2	0	0	0	3	1	0	0	0	1	0	0	0	0	8	0
7:45 AM	0	0	4	1	0	3	2	0	0	0	0	5	0	1	0	1	17	42
8:00 AM	0	0	2	1	0	2	2	0	0	2	0	1	0	0	0	1	11	42
8:15 AM	0	0	2	1	0	0	4	0	0	0	0	1	0	1	1	2	12	48
8:30 AM	0	2	3	1	0	5	3	1	0	2	0	5	0	0	0	0	22	62
8:45 AM	0	2	0	1	0	1	0	2	0	1	2	4	0	0	0	3	16	61
Count Total	0	5	14	5	0	18	19	5	0	5	2	19	0	2	1	8	103	0
Peak Hour	0	1	10	3	0	5	11	1	0	2	0	8	0	2	1	4	48	0

Two-Hour Count Summaries - Bikes														
Interval Start	Wilbur Ave			Wilbur Ave			Cavallo Rd			Fulton Shipyard Rd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	1	2
Count Total	0	1	1	0	0	0	0	0	0	0	0	0	2	0
Peak Hour	0	1	0	0	0	0	0	0	0	0	0	0	1	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.



**Two-Hour Count Summaries**

Interval Start	W 10th St				Beede Way				A St				A St				15-min Total	Rolling One Hour	
	Eastbound				Westbound				Northbound				Southbound						
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
7:00 AM	0	6	0	16	0	2	1	1	0	32	25	1	0	1	19	34	138	0	
7:15 AM	0	15	0	22	0	0	3	0	0	44	28	0	0	0	31	39	182	0	
7:30 AM	0	28	4	35	0	3	4	2	0	50	30	2	0	0	36	42	236	0	
7:45 AM	0	34	2	64	0	5	10	6	0	72	70	2	0	0	48	45	358	914	
8:00 AM	0	29	5	56	0	3	2	0	0	60	62	3	0	2	32	30	284	1,060	
8:15 AM	0	18	0	38	0	2	1	0	0	47	57	3	0	0	28	20	214	1,092	
8:30 AM	0	20	0	31	0	2	0	0	0	40	52	0	0	0	32	17	194	1,050	
8:45 AM	0	18	0	32	0	1	1	3	0	32	57	1	0	0	28	28	201	893	
Count Total	0	168	11	294	0	18	22	12	0	377	381	12	0	3	254	255	1,807	0	
Peak Hour	All	0	109	11	193	0	13	17	8	0	229	219	10	0	2	144	137	1,092	0
	HV	0	5	0	5	0	0	1	0	0	9	5	0	0	0	6	7	38	0
	HV%	-	5%	0%	3%	-	0%	6%	0%	-	4%	2%	0%	-	0%	4%	5%	3%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

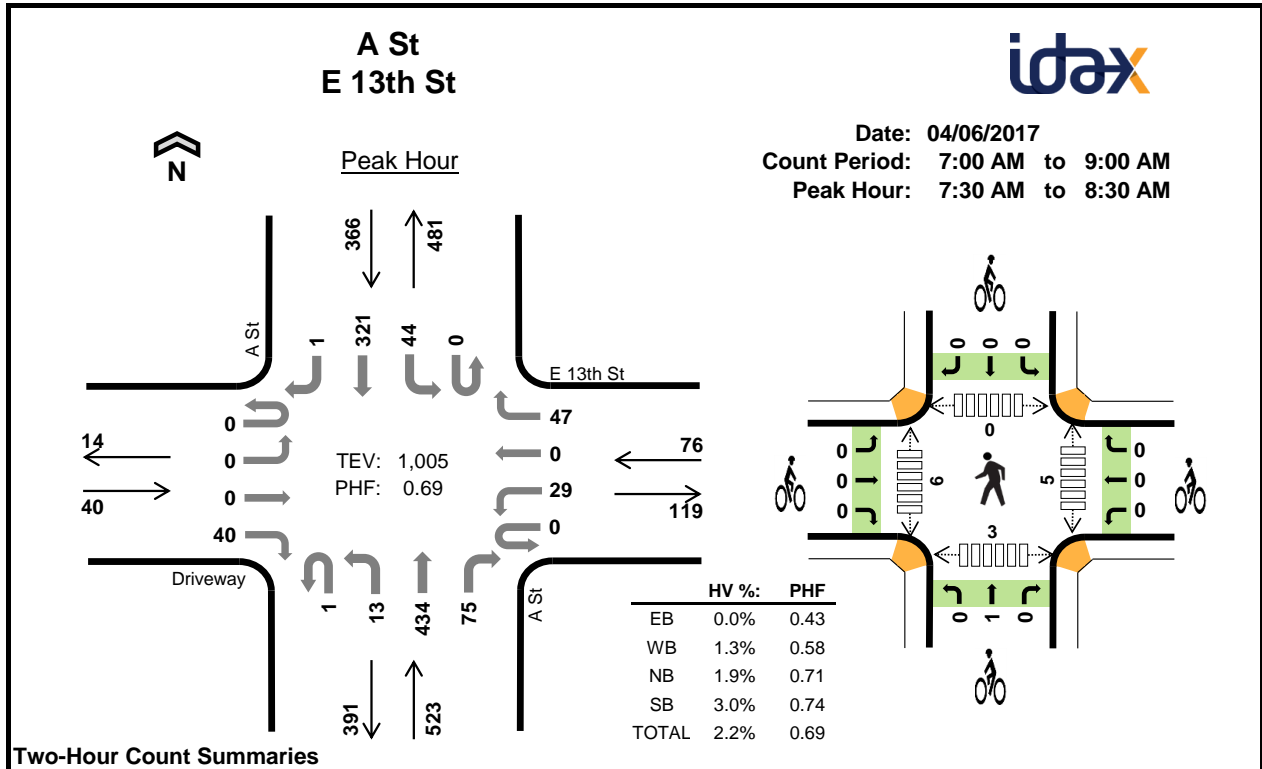
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	0	6	1	9	0	0	0	0	0	1	0	0	0	1
7:15 AM	1	0	2	3	6	0	0	0	0	0	0	0	0	0	2
7:30 AM	2	0	0	4	6	0	0	1	0	1	1	2	0	0	3
7:45 AM	2	1	5	2	10	0	0	0	0	0	3	0	0	3	6
8:00 AM	1	0	7	4	12	0	0	0	0	0	0	0	0	2	2
8:15 AM	5	0	2	3	10	2	0	0	0	2	0	1	0	0	1
8:30 AM	3	0	5	3	11	0	1	0	0	1	2	2	0	0	4
8:45 AM	2	0	4	3	9	0	0	0	0	0	3	0	0	0	3
Count Total	18	1	31	23	73	2	1	1	0	4	10	5	0	7	22
Peak Hour	10	1	14	13	38	2	0	1	0	3	4	3	0	5	12

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	W 10th St				Beede Way				A St				A St				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	2	0	0	0	0	0	4	2	0	0	0	0	1	9	0
7:15 AM	0	0	0	1	0	0	0	0	0	1	1	0	0	0	1	2	6	0
7:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	3	1	6	0
7:45 AM	0	1	0	1	0	0	1	0	0	3	2	0	0	0	1	1	10	31
8:00 AM	0	1	0	0	0	0	0	0	0	4	3	0	0	0	2	2	12	34
8:15 AM	0	2	0	3	0	0	0	0	0	2	0	0	0	0	0	3	10	38
8:30 AM	0	2	0	1	0	0	0	0	0	4	1	0	0	0	1	2	11	43
8:45 AM	0	0	0	2	0	0	0	0	0	2	2	0	0	0	0	3	9	42
Count Total	0	7	0	11	0	0	1	0	0	20	11	0	0	0	8	15	73	0
Peak Hour	0	5	0	5	0	0	1	0	0	9	5	0	0	0	6	7	38	0

Two-Hour Count Summaries - Bikes														
Interval Start	W 10th St			Beede Way			A St			A St			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	2	0	0	0	0	0	0	0	0	0	2	3
8:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	1	3
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Count Total	0	0	2	0	1	0	0	1	0	0	0	0	4	0
Peak Hour	0	0	2	0	0	0	0	1	0	0	0	0	3	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.



Two-Hour Count Summaries

Interval Start	Driveway				E 13th St				A St				A St				15-min Total	Rolling One Hour	
	Eastbound				Westbound				Northbound				Southbound						
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
7:00 AM	0	0	0	0	0	9	0	2	0	1	54	4	0	2	34	0	106	0	
7:15 AM	0	0	0	0	0	8	0	3	0	0	72	7	0	4	55	0	149	0	
7:30 AM	0	0	0	2	0	9	0	6	1	0	73	10	0	6	69	1	177	0	
7:45 AM	0	0	0	23	0	7	0	26	0	0	143	41	0	22	102	0	364	796	
8:00 AM	0	0	0	14	0	7	0	11	0	12	114	20	0	12	82	0	272	962	
8:15 AM	0	0	0	1	0	6	0	4	0	1	104	4	0	4	68	0	192	1,005	
8:30 AM	0	0	0	0	0	2	0	3	0	0	96	4	0	1	69	0	175	1,003	
8:45 AM	0	0	0	1	0	8	0	4	0	0	90	4	1	4	56	0	168	807	
Count Total	0	0	0	41	0	56	0	59	1	14	746	94	1	55	535	1	1,603	0	
Peak Hour	All	0	0	0	40	0	29	0	47	1	13	434	75	0	44	321	1	1,005	0
	HV	0	0	0	0	0	0	0	1	0	0	10	0	0	1	10	0	22	0
	HV%	-	-	-	0%	-	0%	-	2%	0%	0%	2%	0%	-	2%	3%	0%	2%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	1	5	2	8	0	0	0	0	0	0	2	0	0	2
7:15 AM	0	0	1	3	4	0	0	0	0	0	0	5	0	1	6
7:30 AM	0	0	0	4	4	0	0	1	0	1	2	3	0	2	7
7:45 AM	0	1	4	2	7	0	0	0	0	0	2	0	0	1	3
8:00 AM	0	0	6	2	8	0	0	0	0	0	1	2	0	0	3
8:15 AM	0	0	0	3	3	0	0	0	0	0	0	1	0	0	1
8:30 AM	0	0	5	2	7	0	0	0	0	0	3	7	0	1	11
8:45 AM	1	0	2	2	5	0	0	0	0	0	2	3	0	1	6
Count Total	1	2	23	20	46	0	0	1	0	1	10	23	0	6	39
Peak Hour	0	1	10	11	22	0	0	1	0	1	5	6	0	3	14



Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	Driveway				E 13th St				A St				A St				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	1	0	0	5	0	0	0	2	0	8	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	0	4	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0
7:45 AM	0	0	0	0	0	0	0	1	0	0	4	0	0	1	1	0	7	23
8:00 AM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	2	0	8	23
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	22
8:30 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	2	0	7	25
8:45 AM	0	0	0	1	0	0	0	0	0	0	2	0	0	0	2	0	5	23
Count Total	0	0	0	1	0	0	0	2	0	0	22	1	0	1	19	0	46	0
Peak Hour	0	0	0	0	0	0	0	1	0	0	10	0	0	1	10	0	22	0

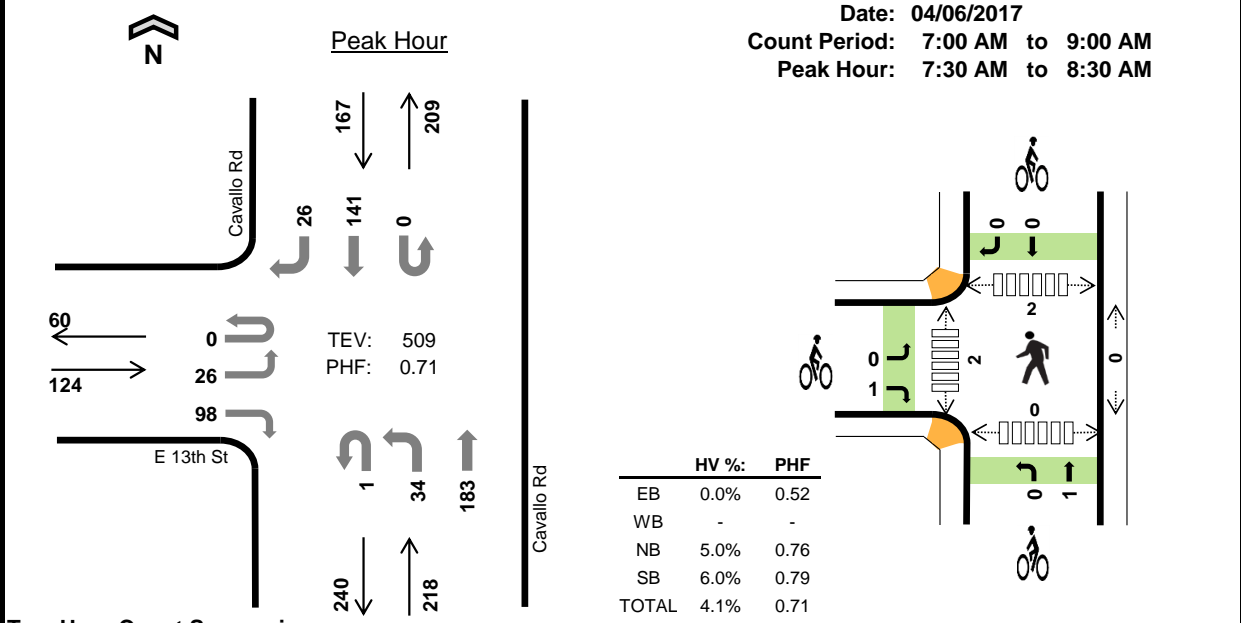
Two-Hour Count Summaries - Bikes																	
Interval Start	Driveway			E 13th St			A St			A St			15-min Total	Rolling One Hour			
	Eastbound			Westbound			Northbound			Southbound							
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT					
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Peak Hour	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

### Cavallo Rd E 13th St



Date: 04/06/2017  
 Count Period: 7:00 AM to 9:00 AM  
 Peak Hour: 7:30 AM to 8:30 AM



	HV %:	PHF
EB	0.0%	0.52
WB	-	-
NB	5.0%	0.76
SB	6.0%	0.79
TOTAL	4.1%	0.71

#### Two-Hour Count Summaries

Interval Start	E 13th St			0			Cavallo Rd			Cavallo Rd			15-min Total	Rolling One Hour			
	Eastbound			Westbound			Northbound			Southbound							
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT					
7:00 AM	0	0	0	4	0	0	0	0	0	1	11	0	0	0	36	0	
7:15 AM	0	1	0	7	0	0	0	0	0	4	30	0	0	0	67	0	
7:30 AM	0	5	0	11	0	0	0	0	0	7	42	0	0	0	102	0	
7:45 AM	0	13	0	47	0	0	0	0	0	20	52	0	0	0	178	383	
8:00 AM	0	6	0	28	0	0	0	0	0	6	48	0	0	0	141	488	
8:15 AM	0	2	0	12	0	0	0	0	1	1	41	0	0	0	88	509	
8:30 AM	0	0	0	6	0	0	0	0	0	2	42	0	0	0	80	487	
8:45 AM	0	1	0	7	0	0	0	0	0	6	27	0	0	0	63	372	
Count Total	0	28	0	122	0	0	0	0	1	47	293	0	0	0	755	0	
Peak Hour	All	0	26	0	98	0	0	0	0	1	34	183	0	0	0	509	0
	HV	0	0	0	0	0	0	0	0	0	0	11	0	0	0	21	0
	HV%	-	0%	-	0%	-	-	-	-	0%	0%	6%	-	-	-	4%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

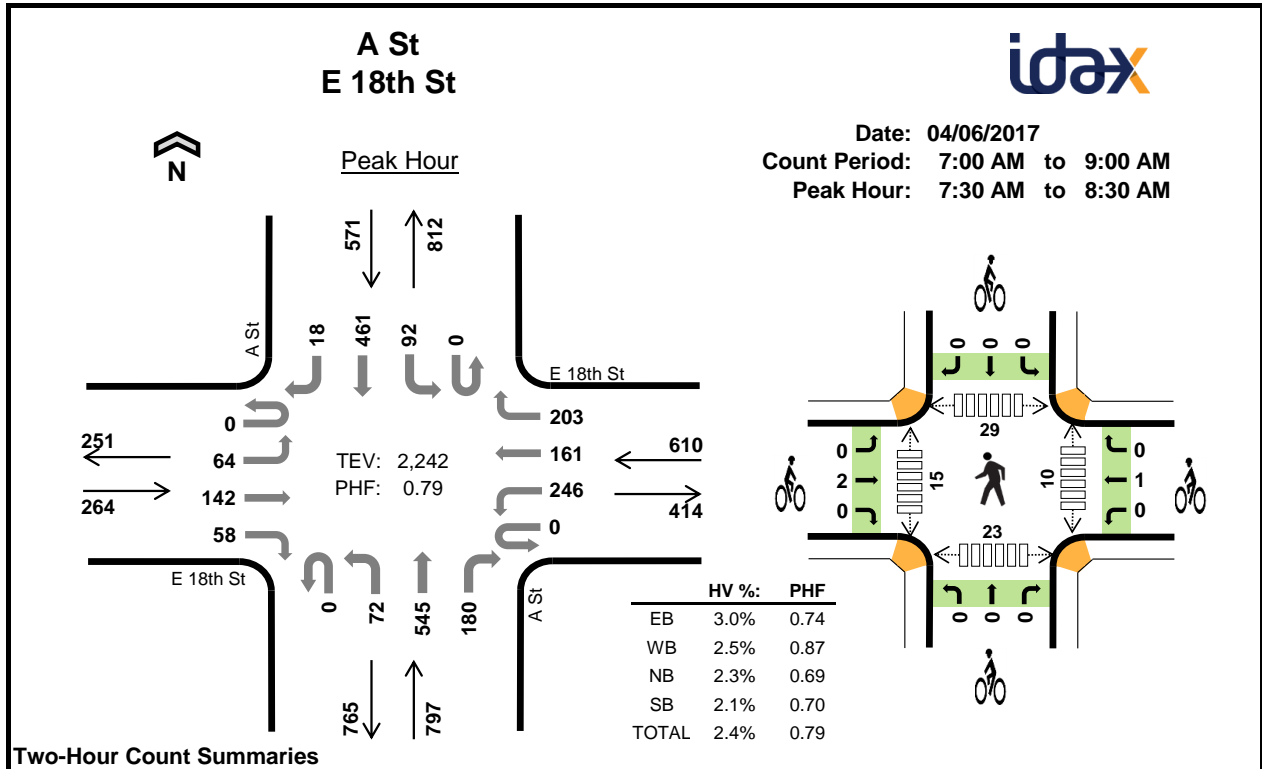
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	2	4	6	0	0	0	1	1	0	0	1	0	1
7:15 AM	2	0	1	2	5	0	0	0	0	0	0	0	8	0	8
7:30 AM	0	0	2	1	3	1	0	0	0	1	0	0	1	0	1
7:45 AM	0	0	4	4	8	0	0	1	0	1	0	2	0	0	2
8:00 AM	0	0	3	3	6	0	0	0	0	0	0	0	1	0	1
8:15 AM	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	4	6	10	0	0	0	1	1	0	0	1	0	1
8:45 AM	0	0	7	3	10	0	0	0	0	0	0	0	0	0	0
Count Total	2	0	25	25	52	1	0	1	2	4	0	2	12	0	14
Peak Hr	0	0	11	10	21	1	0	1	0	2	0	2	2	0	4

<b>Two-Hour Count Summaries - Heavy Vehicles</b>																		
Interval Start	E 13th St				0				Cavallo Rd				15-min Total	Rolling One Hour				
	Eastbound				Westbound				Northbound						Southbound			
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	1	1	0	0	0	4	0	6	0
7:15 AM	0	0	0	2	0	0	0	0	0	0	1	0	0	0	2	0	5	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	8	22
8:00 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	6	22
8:15 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	4	21
8:30 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	5	1	10	28
8:45 AM	0	0	0	0	0	0	0	0	0	0	7	0	0	0	3	0	10	30
Count Total	0	0	0	2	0	0	0	0	0	1	24	0	0	0	24	1	52	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	11	0	0	0	10	0	21	0

<b>Two-Hour Count Summaries - Bikes</b>														
Interval Start	E 13th St			0			Cavallo Rd			Cavallo Rd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	1	0
7:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	3
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	1	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Count Total	0	0	1	0	0	0	0	1	0	0	0	2	4	0
Peak Hour	0	0	1	0	0	0	0	1	0	0	0	0	2	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.



**Two-Hour Count Summaries**

Interval Start	E 18th St Eastbound				E 18th St Westbound				A St Northbound				A St Southbound				15-min Total	Rolling One Hour	
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
7:00 AM	0	4	14	5	0	29	17	24	0	3	55	14	0	7	45	1	218	0	
7:15 AM	0	13	12	7	0	28	22	32	0	3	65	24	0	17	60	2	285	0	
7:30 AM	0	9	27	15	0	46	61	48	0	29	129	35	0	14	92	6	511	0	
7:45 AM	0	32	40	17	0	57	41	78	0	16	222	49	0	23	132	2	709	1,723	
8:00 AM	0	14	47	21	0	80	33	37	0	19	96	47	0	33	167	4	598	2,103	
8:15 AM	0	9	28	5	0	63	26	40	0	8	98	49	0	22	70	6	424	2,242	
8:30 AM	0	6	29	10	0	60	35	36	0	10	78	31	0	20	63	2	380	2,111	
8:45 AM	0	13	25	6	0	40	32	24	0	9	78	31	0	17	67	6	348	1,750	
Count Total	0	100	222	86	0	403	267	319	0	97	821	280	0	153	696	29	3,473	0	
Peak Hour	All	0	64	142	58	0	246	161	203	0	72	545	180	0	92	461	18	2,242	0
	HV	0	0	3	5	0	7	4	4	0	3	6	9	0	4	8	0	53	0
	HV%	-	0%	2%	9%	-	3%	2%	2%	-	4%	1%	5%	-	4%	2%	0%	2%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	4	3	2	10	0	0	0	1	1	0	7	1	1	9
7:15 AM	0	0	3	4	7	0	0	0	0	0	0	5	3	13	21
7:30 AM	2	2	3	4	11	0	1	0	0	1	3	4	10	7	24
7:45 AM	2	4	4	1	11	2	0	0	0	2	3	9	9	13	34
8:00 AM	2	6	6	3	17	0	0	0	0	0	1	1	7	2	11
8:15 AM	2	3	5	4	14	0	0	0	0	0	3	1	3	1	8
8:30 AM	3	10	6	2	21	0	0	0	0	0	2	10	6	2	20
8:45 AM	2	4	3	4	13	0	0	0	0	0	4	8	1	8	21
Count Total	14	33	33	24	104	2	1	0	1	4	16	45	40	47	148
Peak Hour	8	15	18	12	53	2	1	0	0	3	10	15	29	23	77

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	E 18th St				E 18th St				A St				A St				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	1	0	0	0	2	2	0	0	3	0	0	1	1	0	10	0
7:15 AM	0	0	0	0	0	0	0	0	0	1	1	1	0	3	1	0	7	0
7:30 AM	0	0	0	2	0	1	1	0	0	1	0	2	0	1	3	0	11	0
7:45 AM	0	0	1	1	0	2	0	2	0	1	1	2	0	0	1	0	11	39
8:00 AM	0	0	0	2	0	4	1	1	0	0	3	3	0	1	2	0	17	46
8:15 AM	0	0	2	0	0	0	2	1	0	1	2	2	0	2	2	0	14	53
8:30 AM	0	1	1	1	0	3	3	4	0	2	4	0	0	0	2	0	21	63
8:45 AM	0	0	2	0	0	3	0	1	0	1	1	1	0	2	2	0	13	65
Count Total	0	1	7	6	0	13	9	11	0	7	15	11	0	10	14	0	104	0
Peak Hour	0	0	3	5	0	7	4	4	0	3	6	9	0	4	8	0	53	0

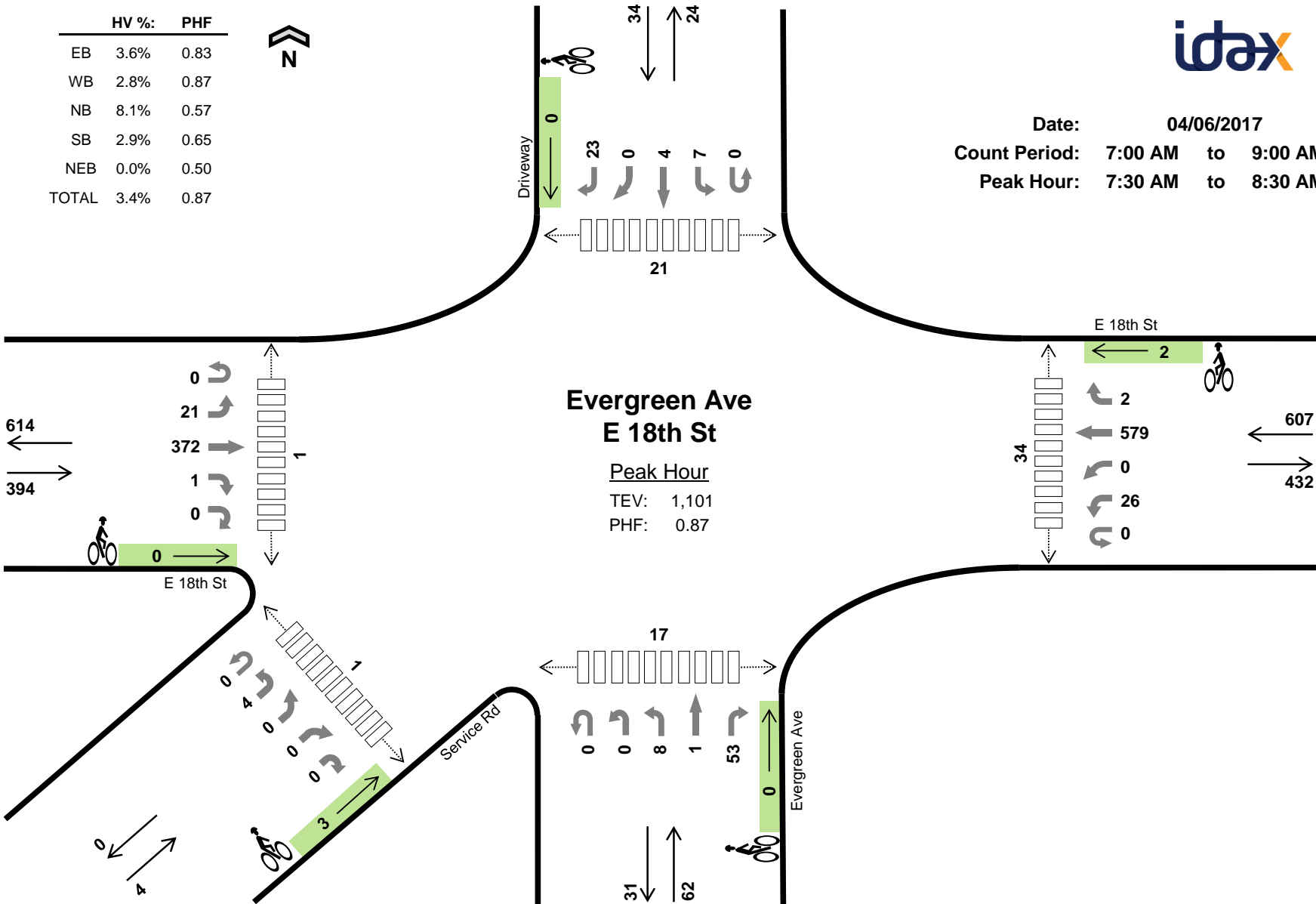
Two-Hour Count Summaries - Bikes																	
Interval Start	E 18th St			E 18th St			A St			A St			15-min Total	Rolling One Hour			
	Eastbound			Westbound			Northbound			Southbound							
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT					
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
7:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	2	0	0	0	1	0	0	0	0	0	0	0	0	1	4	0
Peak Hour	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.



Date: 04/06/2017  
 Count Period: 7:00 AM to 9:00 AM  
 Peak Hour: 7:30 AM to 8:30 AM

	HV %:	PHF
EB	3.6%	0.83
WB	2.8%	0.87
NB	8.1%	0.57
SB	2.9%	0.65
NEB	0.0%	0.50
TOTAL	3.4%	0.87



Two-Hour Count Summaries

Interval Start	E 18th St Eastbound					E 18th St Westbound					Evergreen Ave Northbound					Driveway Southbound					Service Rd Northeastbound					15-min Total	Rolling One Hour	
	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	LT	TH	RT	UT	LT	TH	BR	RT	UT	HL	BL	BR	HR			
	7:00 AM	0	3	33	0	0	0	1	0	68	0	0	0	3	0	3	0	3	0	0	2	0	2	0	0			0
7:15 AM	0	1	45	0	0	0	1	0	83	0	0	0	1	0	5	0	0	0	0	4	0	0	0	0	0	140	0	
7:30 AM	0	4	75	0	0	0	8	0	156	0	0	0	2	1	15	0	1	1	0	6	0	0	0	0	0	269	0	
7:45 AM	0	6	99	1	0	0	5	0	169	0	0	0	3	0	24	0	2	1	0	3	0	2	0	0	0	315	842	
8:00 AM	0	7	111	0	0	0	10	0	131	1	0	0	1	0	12	0	2	0	0	5	0	1	0	0	0	281	1,005	
8:15 AM	0	4	87	0	0	0	3	0	123	1	0	0	2	0	2	0	2	2	0	9	0	1	0	0	0	236	1,101	
8:30 AM	0	3	74	0	0	0	2	0	115	0	0	0	0	0	2	0	1	0	0	8	0	2	0	0	1	208	1,040	
8:45 AM	0	4	62	0	0	0	2	0	94	0	0	0	3	0	2	0	1	0	0	4	0	0	0	0	3	175	900	
Count Total	0	32	586	1	0	0	32	0	939	2	0	0	15	1	65	0	12	4	0	41	0	8	0	0	4	1,742	0	
Peak Hour	All HV	0	21	372	1	0	0	26	0	579	2	0	0	8	1	53	0	7	4	0	23	0	4	0	0	0	1,101	0
	HV%	-	5%	3%	0%	-	-	4%	-	3%	0%	-	-	0%	0%	5	-	0%	0%	-	4%	-	0%	-	-	-	37	0
		-				-	-					-	-				-					-		-	-		0	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals						Bicycles						Pedestrians (Crossing Leg)					
	EB	WB	NB	SB	NEB	Total	EB	WB	NB	SB	NEB	Total	East	West	North	South	Southwest	Total
7:00 AM	2	4	0	0	0	6	0	0	0	0	0	0	2	0	1	8	0	11
7:15 AM	3	3	0	0	0	6	0	0	0	0	0	0	4	0	4	4	0	12
7:30 AM	2	1	0	0	0	3	0	1	0	0	0	1	15	1	6	11	1	34
7:45 AM	2	5	2	0	0	9	0	1	0	0	1	2	10	0	6	4	0	20
8:00 AM	4	7	1	1	0	13	0	0	0	0	0	0	6	0	6	2	0	14
8:15 AM	6	4	2	0	0	12	0	0	0	0	2	2	3	0	3	0	0	6
8:30 AM	2	10	0	0	0	12	0	0	0	0	0	0	1	0	1	1	0	3
8:45 AM	4	3	1	0	0	8	0	0	0	0	0	0	2	0	1	3	0	6
Count Total	25	37	6	1	0	69	0	2	0	0	3	5	43	1	28	33	1	106
Peak Hr	14	17	5	1	0	37	0	2	0	0	3	5	34	1	21	17	1	74

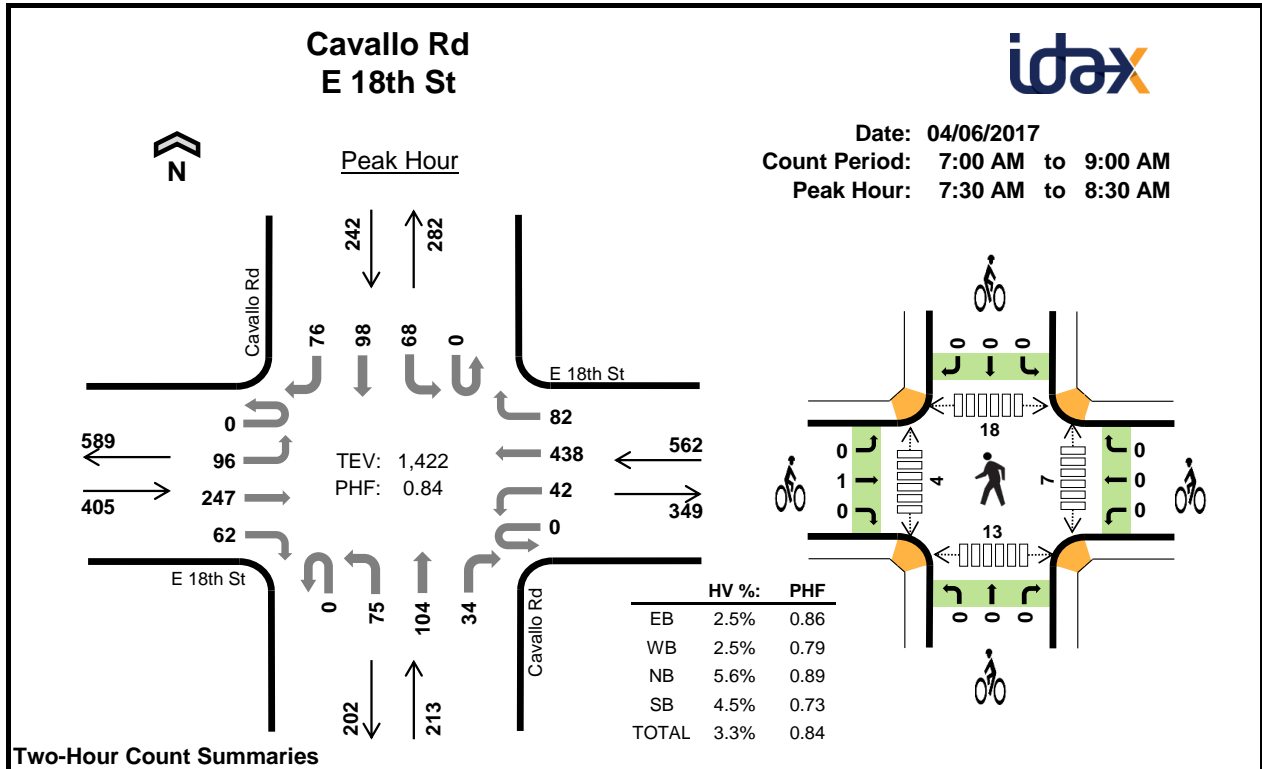
Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 18th St Eastbound					E 18th St Westbound					Evergreen Ave Northbound					Driveway Southbound					Service Rd Northeastbound					15-min Total	Rolling One Hour
	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	LT	TH	RT	UT	LT	TH	BR	RT	UT	HL	BL	BR	HR		
7:00 AM	0	0	2	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	
7:15 AM	0	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	
7:30 AM	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0		
7:45 AM	0	1	1	0	0	0	1	0	4	0	0	0	0	2	0	0	0	0	0	0	0	0	0	9	24		
8:00 AM	0	0	4	0	0	0	0	0	7	0	0	0	0	1	0	0	0	0	0	1	0	0	0	13	31		
8:15 AM	0	0	6	0	0	0	0	0	4	0	0	0	0	2	0	0	0	0	0	0	0	0	0	12	37		
8:30 AM	0	0	2	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	46		
8:45 AM	0	0	4	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	8	45		
Count Total	0	1	24	0	0	0	1	0	36	0	0	0	1	0	5	0	0	0	0	1	0	0	0	69	0		
Peak Hour	0	1	13	0	0	0	1	0	16	0	0	0	0	5	0	0	0	0	1	0	0	0	0	37	0		

Two-Hour Count Summaries - Bikes

Interval Start	E 18th St Eastbound					E 18th St Westbound					Evergreen Ave Northbound					Driveway Southbound					Service Rd Northeastbound					15-min Total	Rolling One Hour
	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	LT	TH	RT	UT	LT	TH	BR	RT	UT	HL	BL	BR	HR		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0		
7:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3		
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3		
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	5		
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4		
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2		
Count Total	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5	0		
Peak Hour	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5	0		





**Two-Hour Count Summaries**

Interval Start	E 18th St Eastbound				E 18th St Westbound				Cavallo Rd Northbound				Cavallo Rd Southbound				15-min Total	Rolling One Hour	
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
7:00 AM	0	8	23	5	0	2	51	8	0	8	6	4	0	9	10	9	143	0	
7:15 AM	0	10	28	10	0	4	66	9	0	7	21	5	0	8	5	15	188	0	
7:30 AM	0	16	45	14	0	8	115	16	0	25	22	3	0	8	16	17	305	0	
7:45 AM	0	32	65	21	0	14	134	29	0	24	28	7	0	21	36	13	424	1,060	
8:00 AM	0	25	77	15	0	13	97	18	0	14	31	15	0	24	33	26	388	1,305	
8:15 AM	0	23	60	12	0	7	92	19	0	12	23	9	0	15	13	20	305	1,422	
8:30 AM	0	18	41	8	0	11	77	26	0	10	18	13	0	11	10	18	261	1,378	
8:45 AM	0	8	45	10	0	11	74	18	0	13	15	7	0	4	13	14	232	1,186	
Count Total	0	140	384	95	0	70	706	143	0	113	164	63	0	100	136	132	2,246	0	
Peak Hour	All	0	96	247	62	0	42	438	82	0	75	104	34	0	68	98	76	1,422	0
	HV	0	4	4	2	0	2	8	4	0	8	3	1	0	5	6	0	47	0
	HV%	-	4%	2%	3%	-	5%	2%	5%	-	11%	3%	3%	-	7%	6%	0%	3%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	4	0	5	11	0	0	0	0	0	2	0	0	4	6
7:15 AM	4	0	0	4	8	0	0	0	0	0	0	3	3	1	7
7:30 AM	1	2	2	2	7	0	0	0	0	0	0	1	4	6	11
7:45 AM	1	8	2	4	15	1	0	0	0	1	4	0	6	2	12
8:00 AM	3	4	5	3	15	0	0	0	0	0	1	0	6	2	9
8:15 AM	5	0	3	2	10	0	0	0	0	0	2	3	2	3	10
8:30 AM	2	7	7	3	19	0	0	0	0	0	0	2	2	0	4
8:45 AM	2	10	4	3	19	0	0	0	0	0	1	1	0	1	3
Count Total	20	35	23	26	104	1	0	0	0	1	10	10	23	19	62
Peak Hour	10	14	12	11	47	1	0	0	0	1	7	4	18	13	42

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	E 18th St				E 18th St				Cavallo Rd				Cavallo Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	1	1	0	0	2	2	0	0	0	0	0	3	2	0	11	0
7:15 AM	0	1	2	1	0	0	0	0	0	0	0	0	0	2	1	1	8	0
7:30 AM	0	1	0	0	0	0	1	1	0	2	0	0	0	1	1	0	7	0
7:45 AM	0	1	0	0	0	0	5	3	0	1	1	0	0	3	1	0	15	41
8:00 AM	0	1	2	0	0	2	2	0	0	2	2	1	0	1	2	0	15	45
8:15 AM	0	1	2	2	0	0	0	0	0	3	0	0	0	0	2	0	10	47
8:30 AM	0	0	2	0	0	0	3	4	0	4	1	2	0	1	1	1	19	59
8:45 AM	0	0	1	1	0	0	5	5	0	3	0	1	0	0	3	0	19	63
Count Total	0	5	10	5	0	2	18	15	0	15	4	4	0	11	13	2	104	0
Peak Hour	0	4	4	2	0	2	8	4	0	8	3	1	0	5	6	0	47	0

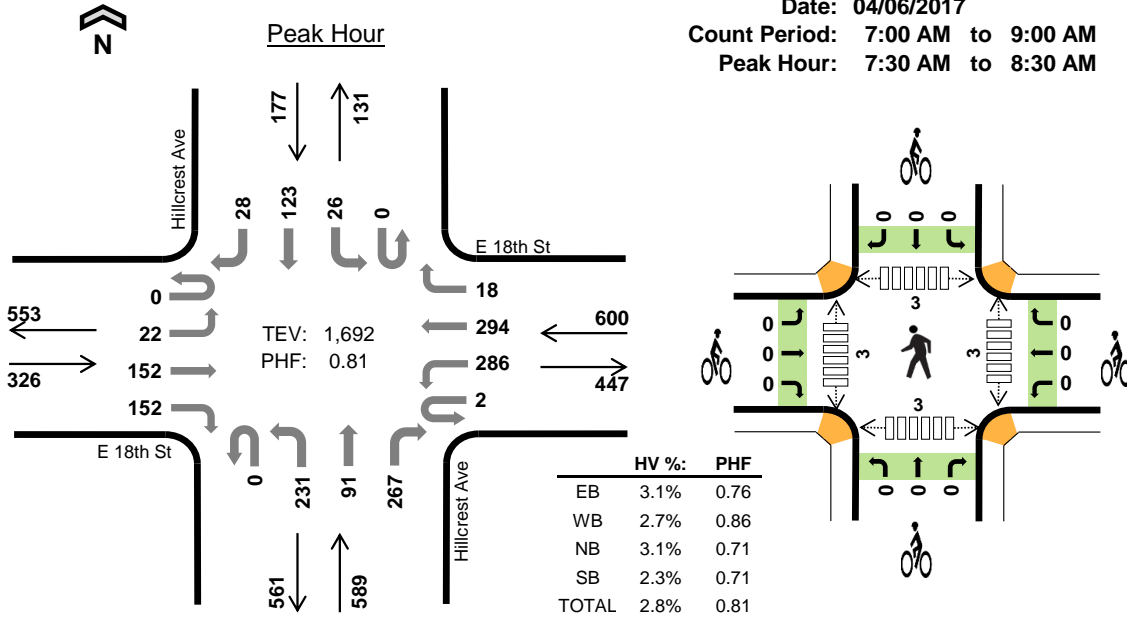
Two-Hour Count Summaries - Bikes														
Interval Start	E 18th St			E 18th St			Cavallo Rd			Cavallo Rd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	1	0	0	0	0	0	0	0	0	0	0	1	0
Peak Hour	0	1	0	0	0	0	0	0	0	0	0	0	1	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

### Hillcrest Ave E 18th St



Date: 04/06/2017  
 Count Period: 7:00 AM to 9:00 AM  
 Peak Hour: 7:30 AM to 8:30 AM



#### Two-Hour Count Summaries

Interval Start	E 18th St Eastbound				E 18th St Westbound				Hillcrest Ave Northbound				Hillcrest Ave Southbound				15-min Total	Rolling One Hour	
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
	7:00 AM	0	6	22	11	0	53	31	3	0	19	9	17	0	9	31			5
7:15 AM	0	5	17	17	1	44	43	3	0	41	15	24	0	6	25	4	245	0	
7:30 AM	0	9	31	23	1	56	76	2	0	59	18	47	0	6	35	6	369	0	
7:45 AM	0	5	42	34	1	77	94	3	0	77	24	106	0	12	39	11	525	1,355	
8:00 AM	0	6	47	54	0	87	59	6	0	49	20	54	0	3	27	4	416	1,555	
8:15 AM	0	2	32	41	0	66	65	7	0	46	29	60	0	5	22	7	382	1,692	
8:30 AM	0	3	27	24	2	63	50	2	0	49	24	35	0	5	35	5	324	1,647	
8:45 AM	1	3	30	32	2	40	52	9	0	45	24	33	0	4	24	6	305	1,427	
Count Total	1	39	248	236	7	486	470	35	0	385	163	376	0	50	238	48	2,782	0	
Peak Hour	All	0	22	152	152	2	286	294	18	0	231	91	267	0	26	123	28	1,692	0
	HV	0	0	7	3	0	9	6	1	0	5	5	8	0	1	2	1	48	0
	HV%	-	0%	5%	2%	0%	3%	2%	6%	-	2%	5%	3%	-	4%	2%	4%	3%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	4	3	5	0	12	0	0	0	0	0	0	1	2	0	3
7:15 AM	3	1	1	0	5	0	0	0	0	0	0	0	0	0	0
7:30 AM	1	8	7	0	16	0	0	0	0	0	0	0	0	0	
7:45 AM	2	5	3	2	12	0	0	0	0	0	0	0	3	3	
8:00 AM	6	2	2	2	12	0	0	0	0	0	3	0	0	1	4
8:15 AM	1	1	6	0	8	0	0	0	0	0	0	3	0	2	5
8:30 AM	3	6	6	0	15	0	2	0	0	2	2	3	0	0	5
8:45 AM	4	11	8	0	23	0	0	0	0	0	2	0	1	1	4
Count Total	24	37	38	4	103	0	2	0	0	2	7	7	6	4	24
Peak Hour	10	16	18	4	48	0	0	0	0	0	3	3	3	3	12

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	E 18th St				E 18th St				Hillcrest Ave				Hillcrest Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	1	2	0	2	1	0	0	2	1	2	0	0	0	0	12	0
7:15 AM	0	0	1	2	0	1	0	0	0	0	0	1	0	0	0	0	5	0
7:30 AM	0	0	1	0	0	7	0	1	0	2	2	3	0	0	0	0	16	0
7:45 AM	0	0	0	2	0	0	5	0	0	2	0	1	0	1	0	1	12	45
8:00 AM	0	0	5	1	0	1	1	0	0	0	2	0	0	0	2	0	12	45
8:15 AM	0	0	1	0	0	1	0	0	0	1	1	4	0	0	0	0	8	48
8:30 AM	0	1	1	1	0	4	2	0	0	4	1	1	0	0	0	0	15	47
8:45 AM	0	1	1	2	0	5	6	0	0	6	2	0	0	0	0	0	23	58
Count Total	0	3	11	10	0	21	15	1	0	17	9	12	0	1	2	1	103	0
Peak Hour	0	0	7	3	0	9	6	1	0	5	5	8	0	1	2	1	48	0

Two-Hour Count Summaries - Bikes														
Interval Start	E 18th St			E 18th St			Hillcrest Ave			Hillcrest Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	1	0	1	0	0	0	0	0	0	2	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Count Total	0	0	0	1	0	1	0	0	0	0	0	0	2	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.



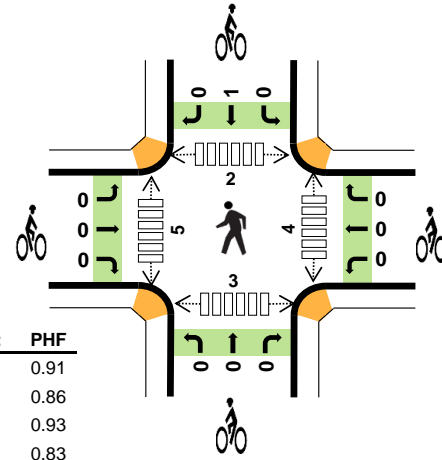
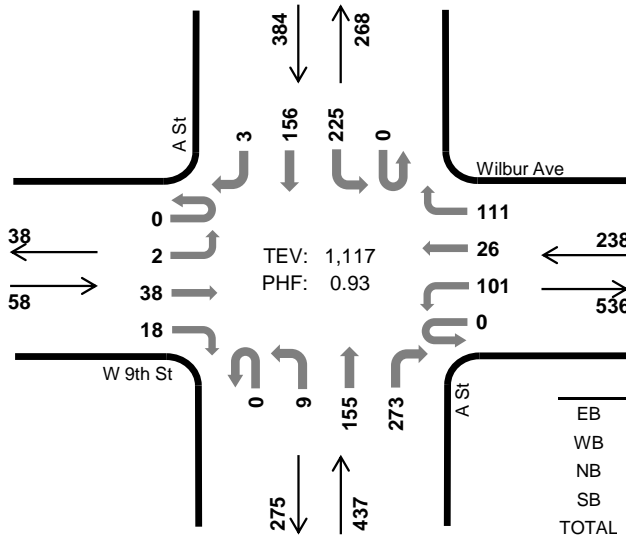
### A St W 9th St

Date: 04/06/2017

Count Period: 4:00 PM to 6:00 PM

Peak Hour: 4:30 PM to 5:30 PM

Peak Hour



	HV %:	PHF
EB	0.0%	0.91
WB	2.9%	0.86
NB	1.6%	0.93
SB	0.5%	0.83
TOTAL	1.4%	0.93

#### Two-Hour Count Summaries

Interval Start	W 9th St				Wilbur Ave				A St				A St				15-min Total	Rolling One Hour	
	Eastbound				Westbound				Northbound				Southbound						
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
4:00 PM	0	0	5	5	0	30	6	21	0	3	37	71	0	44	51	1	274	0	
4:15 PM	0	0	7	4	0	28	7	22	0	1	37	72	0	26	38	2	244	0	
4:30 PM	0	0	10	4	0	31	12	26	0	3	30	68	0	62	39	0	285	0	
4:45 PM	0	1	10	4	0	23	3	34	0	2	45	71	0	49	28	2	272	1,075	
5:00 PM	0	0	12	1	0	22	9	33	0	0	34	73	0	65	50	0	299	1,100	
5:15 PM	0	1	6	9	0	25	2	18	0	4	46	61	0	49	39	1	261	1,117	
5:30 PM	0	0	4	4	0	26	9	28	0	7	36	56	0	29	21	1	221	1,053	
5:45 PM	0	0	7	3	0	30	2	40	0	2	38	52	0	24	37	3	238	1,019	
Count Total	0	2	61	34	0	215	50	222	0	22	303	524	0	348	303	10	2,094	0	
Peak Hour	All	0	2	38	18	0	101	26	111	0	9	155	273	0	225	156	3	1,117	0
	HV	0	0	0	0	0	3	0	4	0	0	3	4	0	2	0	0	16	0
	HV%	-	0%	0%	0%	-	3%	0%	4%	-	0%	2%	1%	-	1%	0%	0%	1%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

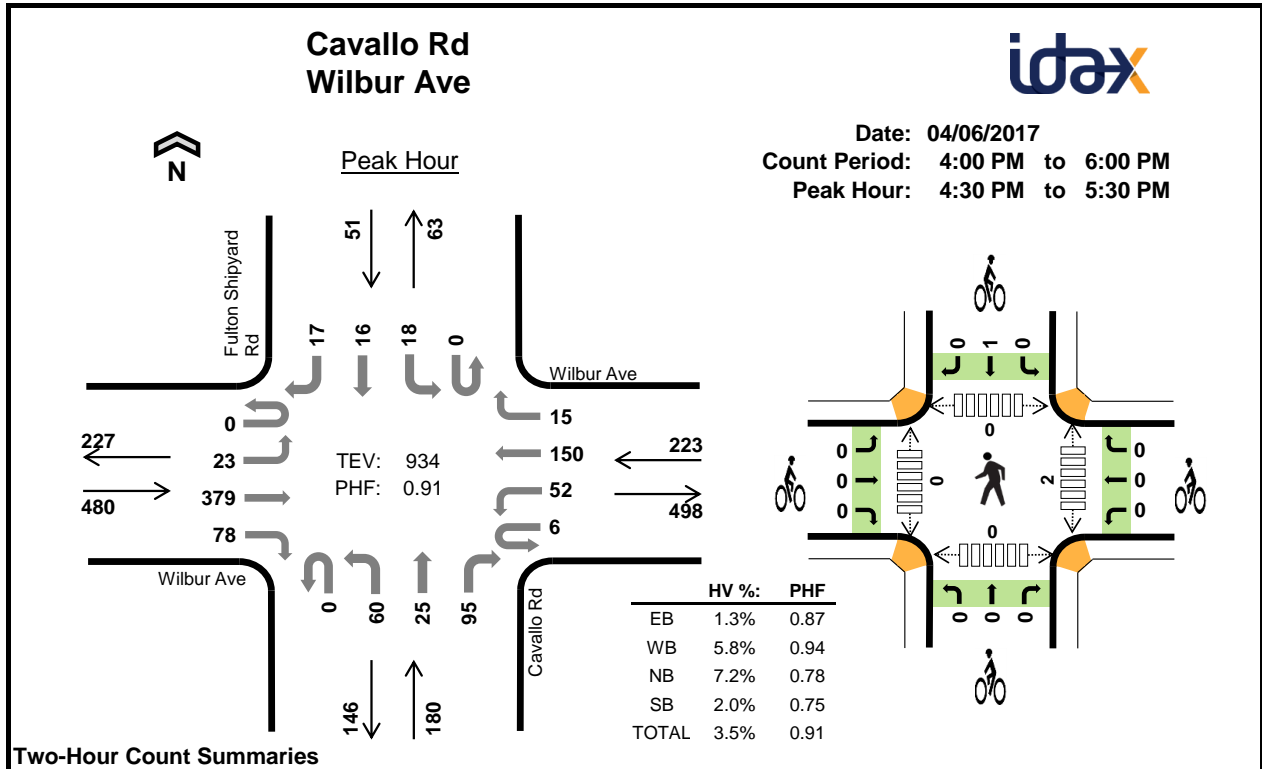
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	1	1	1	3	0	1	0	0	1	2	0	0	0	2
4:15 PM	0	1	1	1	3	0	2	0	0	2	2	1	1	1	4
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2
4:45 PM	0	1	2	1	4	0	0	0	0	0	1	0	0	0	1
5:00 PM	0	2	3	0	5	0	0	0	0	0	2	5	1	1	9
5:15 PM	0	4	2	1	7	0	0	0	1	1	0	0	1	1	2
5:30 PM	0	1	3	1	5	0	0	1	0	1	0	1	0	0	1
5:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
Count Total	0	11	12	5	28	0	3	1	1	5	8	7	3	3	21
Peak Hour	0	7	7	2	16	0	0	0	1	1	4	5	2	3	14

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	W 9th St				Wilbur Ave				A St				A St				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	3	0
4:15 PM	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	3	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	2	0	1	0	0	4	10
5:00 PM	0	0	0	0	0	0	0	2	0	0	2	1	0	0	0	0	5	12
5:15 PM	0	0	0	0	0	3	0	1	0	0	1	1	0	1	0	0	7	16
5:30 PM	0	0	0	0	0	0	0	1	0	0	1	2	0	1	0	0	5	21
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	18
Count Total	0	0	0	0	0	3	1	7	0	0	4	8	0	5	0	0	28	0
Peak Hour	0	0	0	0	0	3	0	4	0	0	3	4	0	2	0	0	16	0

Two-Hour Count Summaries - Bikes														
Interval Start	W 9th St			Wilbur Ave			A St			A St			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	1	0
4:15 PM	0	0	0	0	1	1	0	0	0	0	0	0	2	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	1
5:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	1	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Count Total	0	0	0	0	2	1	0	0	1	0	1	0	5	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	1	0	1	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.



**Two-Hour Count Summaries**

Interval Start	Wilbur Ave Eastbound				Wilbur Ave Westbound				Cavallo Rd Northbound				Fulton Shipyard Rd Southbound				15-min Total	Rolling One Hour	
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
4:00 PM	0	3	92	24	1	16	34	2	0	14	3	9	0	5	3	3	209	0	
4:15 PM	0	5	75	13	3	5	34	2	0	15	9	20	0	3	3	4	191	0	
4:30 PM	0	1	98	20	0	12	39	5	0	21	8	29	0	8	7	2	250	0	
4:45 PM	0	6	78	24	3	12	39	3	0	11	5	24	0	3	5	2	215	865	
5:00 PM	0	11	110	17	3	16	37	3	0	20	4	21	0	6	1	8	257	913	
5:15 PM	0	5	93	17	0	12	35	4	0	8	8	21	0	1	3	5	212	934	
5:30 PM	0	5	70	15	0	15	50	7	0	11	1	25	0	4	4	6	213	897	
5:45 PM	0	6	61	12	2	13	43	4	0	12	1	16	0	6	5	4	185	867	
Count Total	0	42	677	142	12	101	311	30	0	112	39	165	0	36	31	34	1,732	0	
Peak Hour	All	0	23	379	78	6	52	150	15	0	60	25	95	0	18	16	17	934	0
	HV	0	0	6	0	0	6	6	1	0	1	1	11	0	0	1	0	33	0
	HV%	-	0%	2%	0%	0%	12%	4%	7%	-	2%	4%	12%	-	0%	6%	0%	4%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	3	4	0	0	7	0	0	0	0	0	1	0	0	0	1
4:15 PM	0	3	1	0	4	0	2	1	0	3	0	0	0	0	0
4:30 PM	0	2	2	1	5	0	0	0	1	1	1	0	0	0	1
4:45 PM	1	1	5	0	7	0	0	0	0	0	0	0	0	0	0
5:00 PM	2	3	5	0	10	0	0	0	0	0	0	0	0	0	0
5:15 PM	3	7	1	0	11	0	0	0	0	0	1	0	0	0	1
5:30 PM	3	2	1	0	6	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	2	2	0	5	0	0	0	0	0	0	0	0	0	0
Count Total	13	24	17	1	55	0	2	1	1	4	3	0	0	0	3
Peak Hour	6	13	13	1	33	0	0	0	1	1	2	0	0	0	2

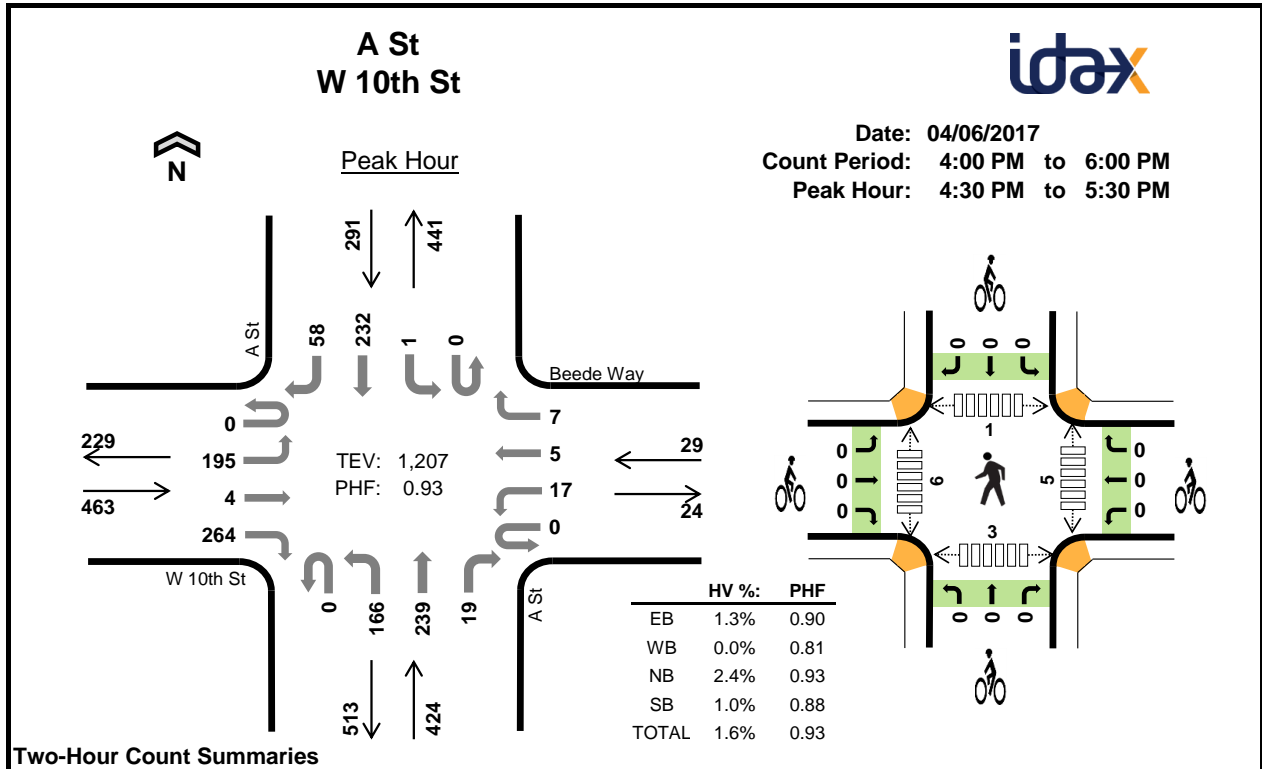
Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	Wilbur Ave				Wilbur Ave				Cavallo Rd				Fulton Shipyard Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	3	0	0	3	1	0	0	0	0	0	0	0	0	0	7	0
4:15 PM	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0	4	0
4:30 PM	0	0	0	0	0	2	0	0	0	0	0	2	0	0	1	0	5	0
4:45 PM	0	0	1	0	0	0	1	0	0	0	0	5	0	0	0	0	7	23
5:00 PM	0	0	2	0	0	2	0	1	0	1	1	3	0	0	0	0	10	26
5:15 PM	0	0	3	0	0	2	5	0	0	0	0	1	0	0	0	0	11	33
5:30 PM	0	0	3	0	0	1	1	0	0	0	0	1	0	0	0	0	6	34
5:45 PM	0	0	1	0	0	1	1	0	0	0	0	2	0	0	0	0	5	32
Count Total	0	0	13	0	0	11	12	1	0	1	1	15	0	0	1	0	55	0
Peak Hour	0	0	6	0	0	6	6	1	0	1	1	11	0	0	1	0	33	0

Two-Hour Count Summaries - Bikes														
Interval Start	Wilbur Ave			Wilbur Ave			Cavallo Rd			Fulton Shipyard Rd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	1	1	0	0	1	0	0	0	3	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	1	1	0	0	1	0	1	0	4	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	1	0	1	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.





Two-Hour Count Summaries

Interval Start	W 10th St				Beede Way				A St				A St				15-min Total	Rolling One Hour	
	Eastbound				Westbound				Northbound				Southbound						
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
4:00 PM	0	60	2	72	0	2	3	1	0	37	49	3	0	0	69	16	314	0	
4:15 PM	0	52	5	55	0	2	0	1	0	32	56	1	0	0	52	16	272	0	
4:30 PM	0	58	1	63	0	2	2	2	0	46	45	6	0	0	64	19	308	0	
4:45 PM	0	42	0	61	0	6	1	2	0	37	72	5	0	1	41	8	276	1,170	
5:00 PM	0	55	1	73	0	5	1	3	0	40	64	4	0	0	68	12	326	1,182	
5:15 PM	0	40	2	67	0	4	1	0	0	43	58	4	0	0	59	19	297	1,207	
5:30 PM	0	40	2	68	0	2	2	1	0	55	58	3	0	0	36	16	283	1,182	
5:45 PM	0	33	5	71	0	2	3	0	0	46	58	1	0	0	62	12	293	1,199	
Count Total	0	380	18	530	0	25	13	10	0	336	460	27	0	1	451	118	2,369	0	
Peak Hour	All	0	195	4	264	0	17	5	7	0	166	239	19	0	1	232	58	1,207	0
	HV	0	2	0	4	0	0	0	0	0	4	6	0	0	0	2	1	19	0
	HV%	-	1%	0%	2%	-	0%	0%	0%	-	2%	3%	0%	-	0%	1%	2%	2%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	0	1	0	2	0	0	1	0	1	0	0	0	0	0
4:15 PM	3	0	0	0	3	0	0	1	0	1	0	0	0	0	
4:30 PM	0	0	2	0	2	0	0	0	0	0	2	1	0	1	
4:45 PM	4	0	3	0	7	0	0	0	0	0	2	0	0	1	
5:00 PM	1	0	3	0	4	0	0	0	0	0	0	5	0	1	
5:15 PM	1	0	2	3	6	0	0	0	0	0	1	0	1	0	
5:30 PM	1	0	2	0	3	1	0	0	0	1	0	1	0	0	
5:45 PM	2	1	1	0	4	0	0	0	0	0	0	1	0	0	
Count Total	13	1	14	3	31	1	0	2	0	3	5	8	1	3	
Peak Hour	6	0	10	3	19	0	0	0	0	0	5	6	1	3	

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	W 10th St				Beede Way				A St				15-min Total	Rolling One Hour				
	Eastbound				Westbound				Northbound						Southbound			
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			UT	LT	TH	RT
4:00 PM	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	2	0
4:15 PM	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3	0
4:30 PM	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2	0
4:45 PM	0	1	0	3	0	0	0	0	0	2	1	0	0	0	0	0	7	14
5:00 PM	0	1	0	0	0	0	0	0	0	1	2	0	0	0	0	0	4	16
5:15 PM	0	0	0	1	0	0	0	0	0	0	2	0	0	0	2	1	6	19
5:30 PM	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	3	20
5:45 PM	0	0	0	2	0	0	1	0	0	1	0	0	0	0	0	0	4	17
Count Total	0	4	0	9	0	0	1	0	0	6	8	0	0	0	2	1	31	0
Peak Hour	0	2	0	4	0	0	0	0	0	4	6	0	0	0	2	1	19	0

Two-Hour Count Summaries - Bikes														
Interval Start	W 10th St			Beede Way			A St			A St			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
4:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	1	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Count Total	1	0	0	0	0	0	0	2	0	0	0	0	3	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0

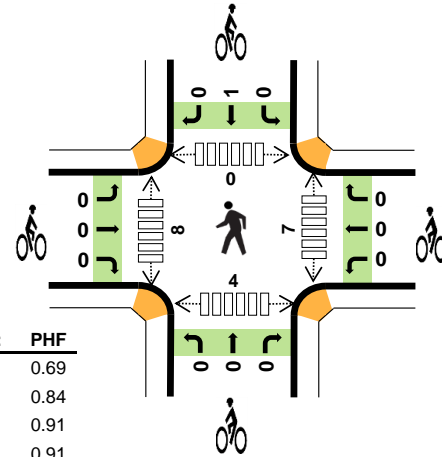
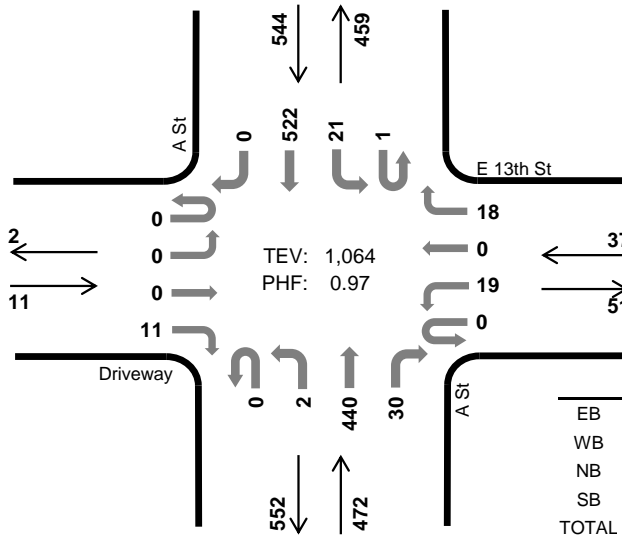
Note: U-Turn volumes for bikes are included in Left-Turn, if any.



### A St E 13th St

Peak Hour

Date: 04/06/2017  
Count Period: 4:00 PM to 6:00 PM  
Peak Hour: 5:00 PM to 6:00 PM



	HV %:	PHF
EB	0.0%	0.69
WB	2.7%	0.84
NB	1.5%	0.91
SB	1.1%	0.91
TOTAL	1.3%	0.97

#### Two-Hour Count Summaries

Interval Start	Driveway				E 13th St				A St				A St				15-min Total	Rolling One Hour	
	Eastbound				Westbound				Northbound				Southbound						
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
4:00 PM	0	0	0	0	0	1	0	0	0	0	89	10	0	5	141	0	246	0	
4:15 PM	0	0	0	2	0	3	0	1	0	0	89	10	0	1	107	0	213	0	
4:30 PM	0	0	2	0	0	8	0	5	0	1	97	6	0	4	128	0	251	0	
4:45 PM	0	1	0	0	0	5	0	5	0	2	110	9	0	2	111	0	245	955	
<b>5:00 PM</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>107</b>	<b>8</b>	<b>0</b>	<b>3</b>	<b>147</b>	<b>0</b>	<b>274</b>	<b>983</b>	
5:15 PM	0	0	0	4	0	6	0	4	0	1	111	4	0	5	135	0	270	1,040	
5:30 PM	0	0	0	1	0	4	0	5	0	1	119	9	1	7	105	0	252	1,041	
5:45 PM	0	0	0	4	0	5	0	6	0	0	103	9	0	6	135	0	268	1,064	
Count Total	0	1	2	13	0	36	0	29	0	5	825	65	1	33	1,009	0	2,019	0	
Peak Hour	All	0	0	0	11	0	19	0	18	0	2	440	30	1	21	522	0	1,064	0
	HV	0	0	0	0	0	0	0	1	0	0	7	0	0	1	5	0	14	0
	HV%	-	-	-	0%	-	0%	-	6%	-	0%	2%	0%	0%	5%	1%	-	1%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	1	1	2	0	0	0	0	0	0	2	0	1	3
4:15 PM	0	1	0	3	4	0	0	1	0	1	0	0	0	1	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	1	3
4:45 PM	0	0	3	4	7	0	0	0	0	0	1	0	0	0	1
<b>5:00 PM</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>4</b>
5:15 PM	0	0	1	4	5	0	0	0	0	0	4	2	0	1	7
5:30 PM	0	0	2	0	2	0	0	0	1	1	2	1	0	0	3
5:45 PM	0	0	0	2	2	0	0	0	0	0	0	4	0	1	5
Count Total	0	2	11	14	27	0	0	1	1	2	9	11	0	7	27
Peak Hour	0	1	7	6	14	0	0	0	1	1	7	8	0	4	19

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	Driveway				E 13th St				A St				A St				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0
4:15 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	0	4	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	4	0	7	13
<b>5:00 PM</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>16</b>	
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	3	0	5	17
5:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	19
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	14
Count Total	0	0	0	0	0	1	0	1	0	0	11	0	0	1	13	0	27	0
Peak Hour	0	0	0	0	0	0	0	1	0	0	7	0	0	1	5	0	14	0

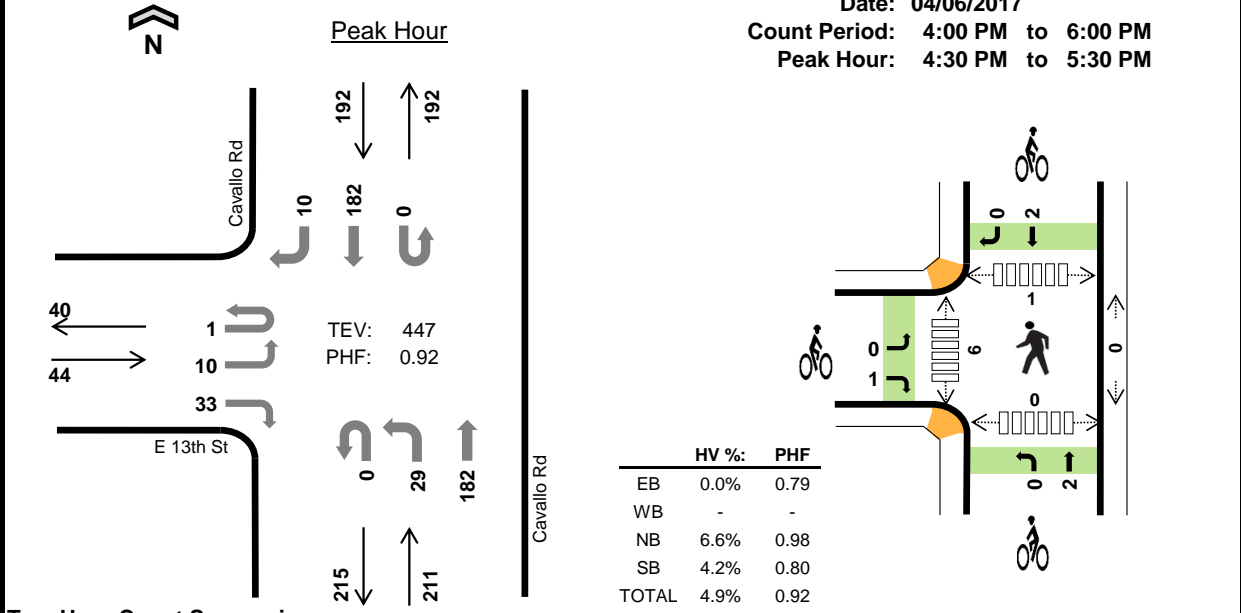
Two-Hour Count Summaries - Bikes																	
Interval Start	Driveway			E 13th St			A St			A St			15-min Total	Rolling One Hour			
	Eastbound			Westbound			Northbound			Southbound							
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT					
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<b>5:00 PM</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Count Total	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

### Cavallo Rd E 13th St



Date: 04/06/2017  
 Count Period: 4:00 PM to 6:00 PM  
 Peak Hour: 4:30 PM to 5:30 PM



#### Two-Hour Count Summaries

Interval Start	E 13th St				0				Cavallo Rd				Cavallo Rd				15-min Total	Rolling One Hour	
	Eastbound				Westbound				Northbound				Southbound						
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
4:00 PM	0	3	0	8	0	0	0	0	0	6	31	0	0	0	56	1	105	0	
4:15 PM	0	7	0	6	0	0	0	0	0	6	40	0	0	0	27	2	88	0	
<b>4:30 PM</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>48</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>58</b>	<b>2</b>	<b>122</b>	<b>0</b>	
4:45 PM	0	3	0	11	0	0	0	0	0	6	47	0	0	0	40	3	110	425	
5:00 PM	1	0	0	7	0	0	0	0	0	10	44	0	0	0	51	2	115	435	
5:15 PM	0	4	0	8	0	0	0	0	0	9	43	0	0	0	33	3	100	447	
5:30 PM	0	7	0	9	0	0	0	0	0	7	29	0	0	0	35	1	88	413	
5:45 PM	0	4	0	8	0	0	0	0	0	6	28	0	0	0	36	3	85	388	
Count Total	1	31	0	64	0	0	0	0	0	54	310	0	0	0	336	17	813	0	
Peak Hour	All	1	10	0	33	0	0	0	0	0	29	182	0	0	0	182	10	447	0
	HV	0	0	0	0	0	0	0	0	0	0	14	0	0	0	8	0	22	0
	HV%	0%	0%	-	0%	-	-	-	-	-	0%	8%	-	-	-	4%	0%	5%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	3	3	0	0	2	0	2	0	0	0	1	1
4:15 PM	0	0	1	0	1	0	0	1	1	2	0	1	0	0	1
<b>4:30 PM</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>
4:45 PM	0	0	5	1	6	1	0	0	1	2	0	1	1	0	2
5:00 PM	0	0	6	4	10	0	0	0	0	0	0	2	0	0	2
5:15 PM	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1
5:30 PM	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	2	1	3	0	0	0	0	0	0	0	0	0	0
Count Total	1	0	17	13	31	1	0	5	3	9	0	7	1	1	9
Peak Hr	0	0	14	8	22	1	0	2	2	5	0	6	1	0	7

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	E 13th St				0				Cavallo Rd				Cavallo Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
<b>4:30 PM</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>5</b>	<b>0</b>
4:45 PM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	1	0	6	15
5:00 PM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	4	0	10	22
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	22
5:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	2	19
5:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	3	16
Count Total	0	0	0	1	0	0	0	0	0	0	17	0	0	0	13	0	31	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	14	0	0	0	8	0	22	0

Two-Hour Count Summaries - Bikes														
Interval Start	E 13th St			0			Cavallo Rd			Cavallo Rd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	2	0
4:15 PM	0	0	0	0	0	0	0	1	0	0	1	0	2	0
<b>4:30 PM</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>
4:45 PM	0	0	1	0	0	0	0	0	0	0	1	0	2	9
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	7
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	5
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	1	0	0	0	0	5	0	0	3	0	9	0
Peak Hour	0	0	1	0	0	0	0	2	0	0	2	0	5	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

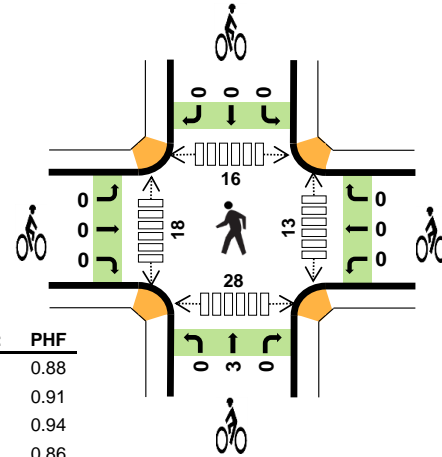
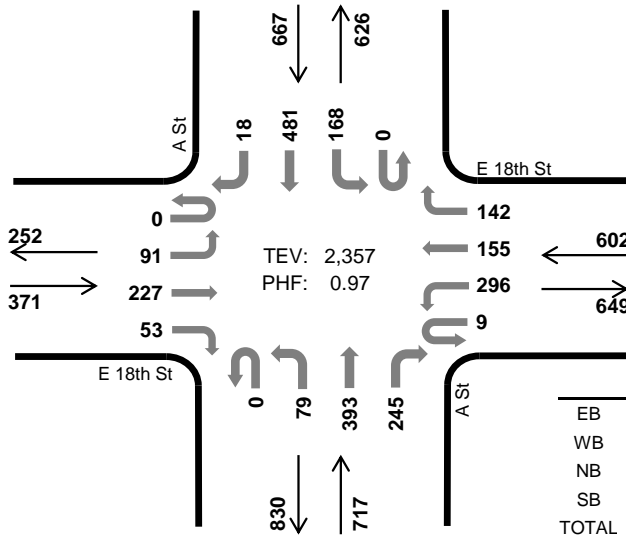


### A St E 18th St

Date: 04/06/2017

Count Period: 4:00 PM to 6:00 PM

Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	1.3%	0.88
WB	1.5%	0.91
NB	1.7%	0.94
SB	1.0%	0.86
TOTAL	1.4%	0.97

#### Two-Hour Count Summaries

Interval Start	E 18th St Eastbound				E 18th St Westbound				A St Northbound				A St Southbound				15-min Total	Rolling One Hour	
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
	4:00 PM	0	14	59	11	1	75	46	37	0	21	91	70	0	41	127			8
4:15 PM	0	16	54	18	0	65	34	36	0	14	96	60	0	33	104	8	538	0	
4:30 PM	0	20	54	18	3	73	31	30	0	26	94	68	0	36	136	5	594	0	
4:45 PM	0	28	64	14	1	72	34	44	0	20	112	58	0	38	81	5	571	2,304	
5:00 PM	0	16	56	10	2	75	46	26	0	19	94	70	0	46	144	4	608	2,311	
5:15 PM	0	27	53	11	3	76	44	42	0	14	93	49	0	48	120	4	584	2,357	
5:30 PM	0	24	48	19	2	67	37	42	0	12	99	53	0	33	102	8	546	2,309	
5:45 PM	0	28	67	24	3	69	31	36	0	12	102	49	0	39	128	7	595	2,333	
Count Total	0	173	455	125	15	572	303	293	0	138	781	477	0	314	942	49	4,637	0	
Peak Hour	All	0	91	227	53	9	296	155	142	0	79	393	245	0	168	481	18	2,357	0
	HV	0	1	2	2	0	4	3	2	0	2	6	4	0	2	5	0	33	0
	HV%	-	1%	1%	4%	0%	1%	2%	1%	-	3%	2%	2%	-	1%	1%	0%	1%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	2	1	3	1	7	0	0	0	0	0	3	4	1	7	15
4:15 PM	0	1	1	1	3	0	0	0	0	0	5	0	6	3	14
4:30 PM	1	3	5	1	10	0	0	2	0	2	2	5	4	7	18
4:45 PM	2	4	1	2	9	0	0	0	0	0	4	1	2	3	10
5:00 PM	1	1	5	1	8	0	0	1	0	1	2	6	8	10	26
5:15 PM	1	1	1	3	6	0	0	0	0	0	5	6	2	8	21
5:30 PM	1	2	2	0	5	1	0	0	0	1	10	4	9	3	26
5:45 PM	1	1	0	1	3	0	0	1	0	1	2	1	3	7	13
Count Total	9	14	18	10	51	1	0	4	0	5	33	27	35	48	143
Peak Hour	5	9	12	7	33	0	0	3	0	3	13	18	16	28	75

Two-Hour Count Summaries - Heavy Vehicles																			
Interval Start	E 18th St				E 18th St				A St				A St				15-min Total	Rolling One Hour	
	Eastbound				Westbound				Northbound				Southbound						
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
4:00 PM	0	0	1	1	0	0	1	0	0	1	1	1	0	0	0	1	0	7	0
4:15 PM	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	3	0
4:30 PM	0	0	1	0	0	2	1	0	0	1	1	3	0	0	1	0	10	0	
4:45 PM	0	1	0	1	0	1	1	2	0	0	0	1	0	0	2	0	9	29	
5:00 PM	0	0	1	0	0	0	1	0	0	1	4	0	0	0	1	0	0	8	30
5:15 PM	0	0	0	1	0	1	0	0	0	0	1	0	0	0	1	2	0	6	33
5:30 PM	0	0	1	0	0	0	1	1	0	1	1	0	0	0	0	0	5	28	
5:45 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	3	22	
Count Total	0	1	4	4	0	5	6	3	0	4	9	5	0	4	6	0	51	0	
Peak Hour	0	1	2	2	0	4	3	2	0	2	6	4	0	2	5	0	33	0	

Two-Hour Count Summaries - Bikes														
Interval Start	E 18th St			E 18th St			A St			A St			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	2	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	2
5:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	1	3
Count Total	0	1	0	0	0	0	0	0	3	1	0	0	5	0
Peak Hour	0	0	0	0	0	0	0	0	3	0	0	0	3	0

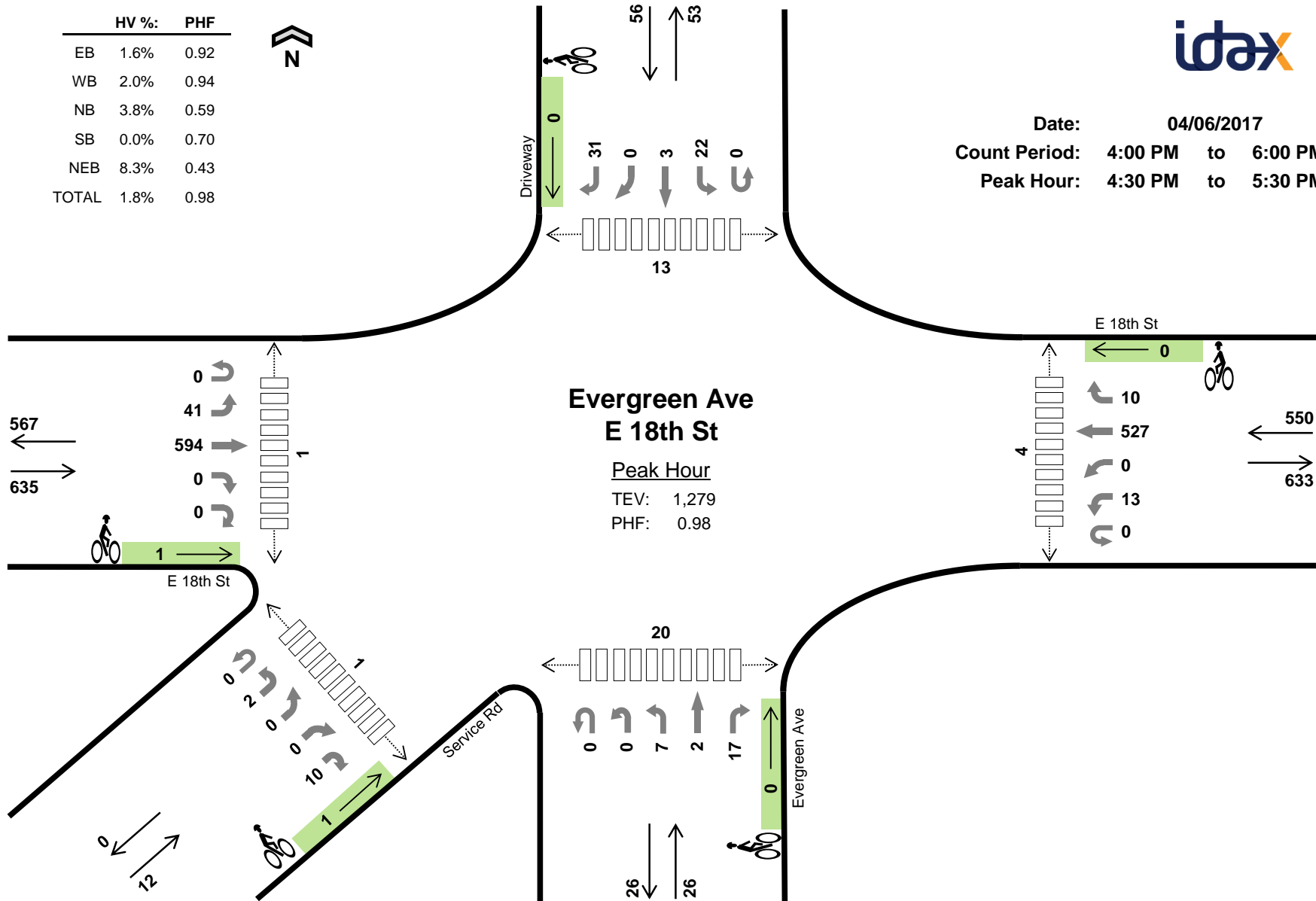
Note: U-Turn volumes for bikes are included in Left-Turn, if any.





Date: 04/06/2017  
 Count Period: 4:00 PM to 6:00 PM  
 Peak Hour: 4:30 PM to 5:30 PM

	HV %:	PHF
EB	1.6%	0.92
WB	2.0%	0.94
NB	3.8%	0.59
SB	0.0%	0.70
NEB	8.3%	0.43
TOTAL	1.8%	0.98



Two-Hour Count Summaries

Interval Start	E 18th St Eastbound					E 18th St Westbound					Evergreen Ave Northbound					Driveway Southbound					Service Rd Northeastbound					15-min Total	Rolling One Hour	
	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	LT	TH	RT	UT	LT	TH	BR	RT	UT	HL	BL	BR	HR			
	4:00 PM	0	8	149	0	0	0	5	0	131	2	0	0	1	0	8	0	6	1	0	11	0	0	0	3			3
4:15 PM	0	12	142	0	0	0	2	0	112	0	0	0	1	0	5	0	9	0	0	8	0	1	0	0	2	294	0	
4:30 PM	0	9	152	0	0	0	3	0	140	3	0	0	1	0	3	0	7	0	0	4	0	0	0	0	2	324	0	
4:45 PM	0	8	151	0	0	0	1	0	137	2	0	0	1	1	3	0	5	2	0	9	0	0	0	0	2	322	1,268	
5:00 PM	0	13	160	0	0	0	7	0	125	0	0	0	2	1	3	0	3	1	0	5	0	2	0	0	5	327	1,267	
5:15 PM	0	11	131	0	0	0	2	0	125	5	0	0	3	0	8	0	7	0	0	13	0	0	0	0	1	306	1,279	
5:30 PM	0	15	111	0	0	0	8	0	128	3	0	0	1	0	5	0	7	1	0	12	0	1	0	0	3	295	1,250	
5:45 PM	0	8	135	0	0	0	6	0	115	1	0	0	3	0	12	0	4	3	0	13	0	0	0	0	0	300	1,228	
Count Total	0	84	1,131	0	0	0	34	0	1,013	16	0	0	13	2	47	0	48	8	0	75	0	4	0	3	18	2,496	0	
Peak Hour	All HV	0	41	594	0	0	13	0	527	10	0	0	7	2	17	0	22	3	0	31	0	2	0	0	10	1,279	0	
	HV%	-	0%	2%	-	-	-	8%	-	2%	0%	-	-	0%	0%	6%	-	0%	0%	-	0%	-	0%	-	-	10%	2%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

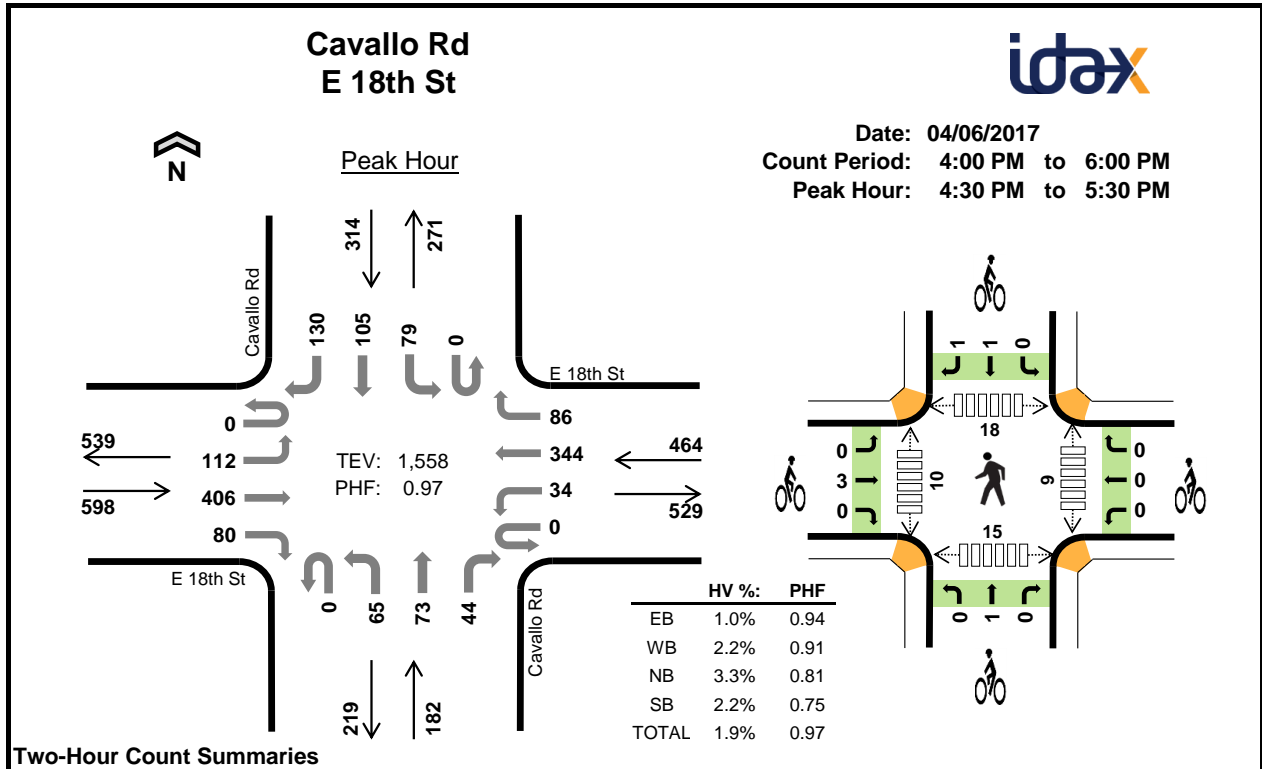
Interval Start	Heavy Vehicle Totals						Bicycles						Pedestrians (Crossing Leg)					
	EB	WB	NB	SB	NEB	Total	EB	WB	NB	SB	NEB	Total	East	West	North	South	Southwest	Total
4:00 PM	2	1	0	0	0	3	0	1	0	0	0	1	2	0	1	8	0	11
4:15 PM	1	1	0	0	0	2	0	1	0	0	0	1	0	0	4	6	0	10
4:30 PM	5	3	0	0	0	8	0	0	0	0	0	0	1	0	3	8	0	12
4:45 PM	1	5	0	0	0	6	0	0	0	0	0	0	0	0	2	2	0	4
5:00 PM	3	2	0	0	1	6	1	0	0	0	1	2	1	0	4	7	0	12
5:15 PM	1	1	1	0	0	3	0	0	0	0	0	0	2	1	4	3	1	11
5:30 PM	1	2	0	0	0	3	1	0	0	0	1	0	3	0	2	6	0	11
5:45 PM	1	1	1	0	0	3	0	0	0	0	0	0	2	0	3	1	0	6
Count Total	15	16	2	0	1	34	2	2	0	0	1	5	11	1	23	41	1	77
Peak Hr	10	11	1	0	1	23	1	0	0	0	1	2	4	1	13	20	1	39

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	E 18th St Eastbound					E 18th St Westbound					Evergreen Ave Northbound					Driveway Southbound					Service Rd Northeastbound					15-min Total	Rolling One Hour
	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	LT	TH	RT	UT	LT	TH	BR	RT	UT	HL	BL	BR	HR		
4:00 PM	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	
4:15 PM	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	
4:30 PM	0	0	5	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	
4:45 PM	0	0	1	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	19	
5:00 PM	0	0	3	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6	22	
5:15 PM	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	23	
5:30 PM	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	18		
5:45 PM	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3	15		
Count Total	0	0	15	0	0	0	1	0	15	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	34	0	
Peak Hour	0	0	10	0	0	0	1	0	10	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	23	0	

Two-Hour Count Summaries - Bikes

Interval Start	E 18th St Eastbound					E 18th St Westbound					Evergreen Ave Northbound					Driveway Southbound					Service Rd Northeastbound					15-min Total	Rolling One Hour
	UT	LT	TH	RT	HR	UT	LT	BL	TH	RT	UT	HL	LT	TH	RT	UT	LT	TH	BR	RT	UT	HL	BL	BR	HR		
4:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
4:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
5:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3	
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
5:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3		
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	
Count Total	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0	
Peak Hour	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	



**Two-Hour Count Summaries**

Interval Start	E 18th St Eastbound				E 18th St Westbound				Cavallo Rd Northbound				Cavallo Rd Southbound				15-min Total	Rolling One Hour	
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
4:00 PM	0	26	107	24	0	5	104	10	0	19	18	12	0	16	30	20	391	0	
4:15 PM	0	22	91	24	0	10	95	29	0	18	16	8	0	16	19	17	365	0	
4:30 PM	0	28	117	14	0	5	83	21	0	19	13	9	0	19	25	32	385	0	
4:45 PM	0	27	102	20	0	13	91	21	0	17	21	18	0	15	25	33	403	1,544	
5:00 PM	0	28	85	29	0	7	72	23	0	13	12	8	0	30	34	41	382	1,535	
5:15 PM	0	29	102	17	0	9	98	21	0	16	27	9	0	15	21	24	388	1,558	
5:30 PM	0	19	82	16	0	9	91	15	0	20	19	11	0	18	25	24	349	1,522	
5:45 PM	0	26	97	22	0	9	85	16	0	17	11	9	0	10	22	23	347	1,466	
Count Total	0	205	783	166	0	67	719	156	0	139	137	84	0	139	201	214	3,010	0	
Peak Hour	All	0	112	406	80	0	34	344	86	0	65	73	44	0	79	105	130	1,558	0
	HV	0	2	4	0	0	1	2	7	0	3	3	0	0	4	2	1	29	0
	HV%	-	2%	1%	0%	-	3%	1%	8%	-	5%	4%	0%	-	5%	2%	1%	2%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	1	0	3	5	0	0	0	0	0	1	2	6	1	10
4:15 PM	1	2	0	1	4	0	0	1	1	2	2	1	5	5	13
4:30 PM	4	3	0	2	9	0	0	0	1	1	0	2	7	2	11
4:45 PM	1	3	5	1	10	3	0	0	0	3	2	0	1	2	5
5:00 PM	1	4	1	2	8	0	0	1	1	2	4	7	5	2	18
5:15 PM	0	0	0	2	2	0	0	0	0	0	3	1	5	9	18
5:30 PM	0	1	1	1	3	0	0	0	0	0	9	1	2	6	18
5:45 PM	1	1	0	1	3	0	0	0	0	0	1	1	5	2	9
Count Total	9	15	7	13	44	3	0	2	3	8	22	15	36	29	102
Peak Hour	6	10	6	7	29	3	0	1	2	6	9	10	18	15	52

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	E 18th St				E 18th St				Cavallo Rd				Cavallo Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	2	1	0	5	0
4:15 PM	0	0	0	1	0	0	1	1	0	0	0	0	0	0	1	0	4	0
4:30 PM	0	2	2	0	0	1	2	0	0	0	0	0	0	2	0	0	9	0
4:45 PM	0	0	1	0	0	0	0	3	0	3	2	0	0	0	0	1	10	28
5:00 PM	0	0	1	0	0	0	0	4	0	0	1	0	0	1	1	0	8	31
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	29
5:30 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	3	23
5:45 PM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	3	16
Count Total	0	2	5	2	0	1	4	10	0	4	3	0	0	7	4	2	44	0
Peak Hour	0	2	4	0	0	1	2	7	0	3	3	0	0	4	2	1	29	0

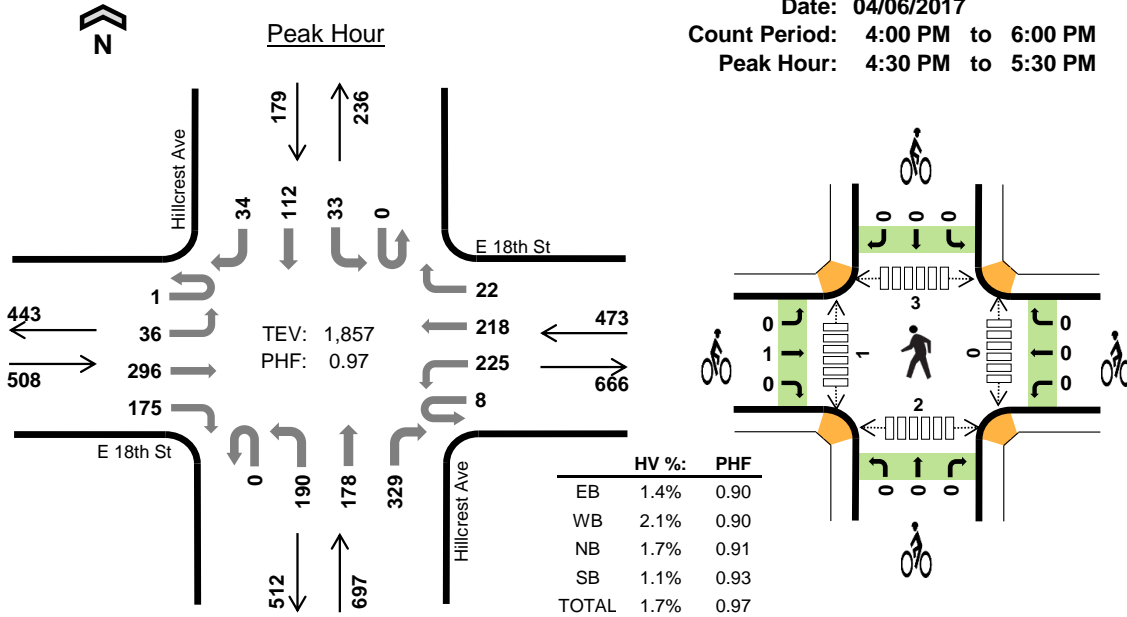
Two-Hour Count Summaries - Bikes															
Interval Start	E 18th St			E 18th St			Cavallo Rd			Cavallo Rd			15-min Total	Rolling One Hour	
	Eastbound			Westbound			Northbound			Southbound					
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT			
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
4:45 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	3	6
5:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	1	2	8
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Count Total	0	3	0	0	0	0	0	0	1	1	0	1	2	8	0
Peak Hour	0	3	0	0	0	0	0	0	1	0	0	1	1	6	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

### Hillcrest Ave E 18th St



Date: 04/06/2017  
 Count Period: 4:00 PM to 6:00 PM  
 Peak Hour: 4:30 PM to 5:30 PM



#### Two-Hour Count Summaries

Interval Start	E 18th St Eastbound				E 18th St Westbound				Hillcrest Ave Northbound				Hillcrest Ave Southbound				15-min Total	Rolling One Hour	
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT			
4:00 PM	1	10	56	50	1	41	53	5	0	44	39	67	0	10	31	7	415	0	
4:15 PM	0	7	67	34	3	49	61	10	0	55	36	67	0	7	26	6	428	0	
4:30 PM	0	12	81	48	2	49	44	8	0	51	46	77	0	9	26	7	460	0	
4:45 PM	0	5	78	31	1	50	52	8	0	57	43	91	0	7	29	12	464	1,767	
5:00 PM	0	8	63	55	3	69	55	5	0	46	51	83	0	6	29	8	481	1,833	
5:15 PM	1	11	74	41	2	57	67	1	0	36	38	78	0	11	28	7	452	1,857	
5:30 PM	1	9	56	35	3	67	64	3	0	41	42	68	0	7	13	4	413	1,810	
5:45 PM	0	9	53	34	3	51	48	3	0	49	43	81	0	7	24	9	414	1,760	
Count Total	3	71	528	328	18	433	444	43	0	379	338	612	0	64	206	60	3,527	0	
Peak Hour	All	1	36	296	175	8	225	218	22	0	190	178	329	0	33	112	34	1,857	0
	HV	0	0	3	4	0	4	6	0	0	7	2	3	0	1	1	0	31	0
	HV%	0%	0%	1%	2%	0%	2%	3%	0%	-	4%	1%	1%	-	3%	1%	0%	2%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	3	10	4	2	19	0	0	0	0	0	3	2	0	0	5
4:15 PM	2	5	5	1	13	0	0	0	0	0	1	0	0	0	1
4:30 PM	4	4	3	0	11	0	0	0	0	0	0	0	1	1	2
4:45 PM	0	1	5	0	6	1	0	0	0	1	0	1	0	0	1
5:00 PM	1	3	2	2	8	0	0	0	0	0	0	0	2	1	3
5:15 PM	2	2	2	0	6	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	4	0	5	0	0	0	0	0	0	1	1	0	2
5:45 PM	1	0	3	1	5	0	1	0	0	1	0	0	1	0	1
Count Total	13	26	28	6	73	1	1	0	0	2	4	4	5	3	16
Peak Hour	7	10	12	2	31	1	0	0	0	1	0	1	3	2	6

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	E 18th St				E 18th St				Hillcrest Ave				Hillcrest Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	3	1	8	1	0	0	0	0	4	0	1	1	0	19	0
4:15 PM	0	0	2	0	0	3	2	0	0	2	1	2	0	0	0	1	13	0
4:30 PM	0	0	1	3	0	2	2	0	0	1	1	1	0	0	0	0	11	0
4:45 PM	0	0	0	0	0	1	0	0	0	4	1	0	0	0	0	0	6	49
5:00 PM	0	0	1	0	0	0	3	0	0	1	0	1	0	1	1	0	8	38
5:15 PM	0	0	1	1	0	1	1	0	0	1	0	1	0	0	0	0	6	31
5:30 PM	0	0	0	0	0	1	0	0	0	0	1	3	0	0	0	0	5	25
5:45 PM	0	0	0	1	0	0	0	0	0	1	0	2	0	1	0	0	5	24
Count Total	0	0	5	8	1	16	9	0	0	10	4	14	0	3	2	1	73	0
Peak Hour	0	0	3	4	0	4	6	0	0	7	2	3	0	1	1	0	31	0

Two-Hour Count Summaries - Bikes														
Interval Start	E 18th St			E 18th St			Hillcrest Ave			Hillcrest Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Count Total	0	1	0	0	1	0	0	0	0	0	0	0	0	2
Peak Hour	0	1	0	0	0	0	0	0	0	0	0	0	0	1

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

PHA Transportation Consultants  
510.848.9233

File Name : 16am  
Site Code : 00000016  
Start Date : 02/17/2016  
Page No : 1

Groups Printed- Group 1

Start Time	G st From North				10th st From East				G st From South				10th st From West				Int. Total		
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds			
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	1	13	5	0	4	101	4	0	2	32	7	1	3	32	3	3			211
07:15 AM	3	17	9	0	4	96	5	0	7	34	6	3	8	38	2	1			233
07:30 AM	4	23	18	0	8	123	11	1	13	44	12	0	21	76	1	2			357
07:45 AM	0	53	16	1	6	140	25	0	4	25	14	0	20	89	4	2			399
Total	8	106	48	1	22	460	45	1	26	135	39	4	52	235	10	8			1200
08:00 AM	5	19	2	0	9	108	7	0	11	30	16	0	12	61	4	6			290
08:15 AM	5	11	2	0	9	77	12	1	3	20	10	0	2	54	7	3			216
08:30 AM	6	12	5	0	5	91	2	0	0	17	7	1	3	49	8	3			209
08:45 AM	1	6	2	0	1	106	3	0	2	15	8	0	1	51	1	0			197
Total	17	48	11	0	24	382	24	1	16	82	41	1	18	215	20	12			912
Grand Total	25	154	59	1	46	842	69	2	42	217	80	5	70	450	30	20			2112
Apprch %	10.5	64.4	24.7	0.4	4.8	87.8	7.2	0.2	12.2	63.1	23.3	1.5	12.3	78.9	5.3	3.5			
Total %	1.2	7.3	2.8	0.0	2.2	39.9	3.3	0.1	2.0	10.3	3.8	0.2	3.3	21.3	1.4	0.9			

Start Time	G st From North					10th st From East					G st From South					10th st From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Intersection 07:15 AM																					
Volume	12	112	45	1	170	27	467	48	1	543	35	133	48	3	219	61	264	11	11	347	1279
Percent	7.1	65.9	26.5	0.6		5.0	86.0	8.8	0.2		16.0	60.7	21.9	1.4		17.6	76.1	3.2	3.2		
07:45 Volume	0	53	16	1	70	6	140	25	0	171	4	25	14	0	43	20	89	4	2	115	399
Peak Factor																					0.801
High Int. 07:45 AM																					
Volume	0	53	16	1	70	6	140	25	0	171	13	44	12	0	69	20	89	4	2	115	
Peak Factor					0.607					0.794					0.793					0.754	



PHA Transportation Consultants  
510.848.9233

File Name : 13amR  
Site Code : 0000013  
Start Date : 03/24/2016  
Page No : 1

Groups Printed- Unshifted

Start Time	G St From North				From East				G St From South				W. 18th From West				Int. Total
	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	
07:00 AM	4	7	5	3	7	58	3	2	2	6	14	0	2	31	8	0	152
07:15 AM	5	6	7	17	7	48	3	3	3	11	4	0	4	22	5	0	145
07:30 AM	23	7	11	22	14	65	3	0	8	15	17	0	8	39	11	0	243
07:45 AM	32	24	24	83	14	69	14	2	22	21	43	0	32	40	8	0	428
Total	64	44	47	125	42	240	23	7	35	53	78	0	46	132	32	0	968
08:00 AM	61	42	30	133	10	42	10	3	13	23	30	0	43	15	9	0	464
08:15 AM	16	33	25	53	13	60	19	0	7	29	42	0	39	32	12	0	380
08:30 AM	24	13	12	19	14	87	12	1	4	24	39	0	37	47	18	0	351
08:45 AM	15	7	11	8	10	72	3	0	6	19	18	0	19	35	8	0	231
Total	116	95	78	213	47	261	44	4	30	95	129	0	138	129	47	0	1426
Grand Total	180	139	125	338	89	501	67	11	65	148	207	0	184	261	79	0	2394
Apprch %	23.0	17.8	16.0	43.2	13.3	75.0	10.0	1.6	15.5	35.2	49.3	0.0	35.1	49.8	15.1	0.0	
Total %	7.5	5.8	5.2	14.1	3.7	20.9	2.8	0.5	2.7	6.2	8.6	0.0	7.7	10.9	3.3	0.0	

Start Time	G St From North					From East					G St From South					W. 18th From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Intersection	07:45 AM																				
Volume	133	112	91	288	624	51	258	55	6	370	46	97	154	0	297	151	134	47	0	332	1623
Percent	21.3	17.9	14.6	46.2		13.8	69.7	14.9	1.6		15.5	32.7	51.9	0.0		45.5	40.4	14.2	0.0		
08:00 Volume	61	42	30	133	266	10	42	10	3	65	13	23	30	0	66	43	15	9	0	67	464
Peak Factor																					0.874
High Int.	08:00 AM					08:30 AM					07:45 AM					08:30 AM					
Volume	61	42	30	133	266	14	87	12	1	114	22	21	43	0	86	37	47	18	0	102	
Peak Factor	0.586										0.811					0.863					0.814

## **Appendix B**

### **Volume Summary Tables**

Antioch Rocketship School TIA AM Conditions

Scenario:		Movements																Total				
		North Approach				East Approach				South Approach				West Approach				Southwest Approach				
		RT2	RT	TH	LT	RT	TH	LT	LT2	RT	TH	LT	LT2	RT2	RT	TH	LT	RT2	RT	LT	LT2	
Intersection Number: <b>1</b>																						
Synchro Node Number: 1																						
Intersection Name: A Street & East 9th Street/Wilbur Avenue																						
Peak Hour: AM																						
Count Date: 04/06/17																						
Scenario: Antioch Rocketship School																						
INDEX		9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
PHF		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	5	84	72	205	51	180	0	186	139	8	0	0	13	19	3	0	0	0	0	965
Project Trips		0	0	6	32	26	0	24	0	28	5	0	0	0	0	0	0	0	0	0	0	121
Existing + Project		0	5	90	104	231	51	204	0	214	144	8	0	0	13	19	3	0	0	0	0	1086
Cumulative Baseline Conditions		0	5	90	77	205	51	180	0	186	139	8	0	0	13	19	3	0	0	0	0	976
Cumulative + Proj Conditions		0	5	96	109	231	51	204	0	214	144	8	0	0	13	19	3	0	0	0	0	1097
Intersection Number: <b>2</b>																						
Synchro Node Number: 2																						
Intersection Name: Cavallo Road & Wilbur Avenue																						
Peak Hour: AM																						
Count Date: 04/06/17																						
Scenario: Antioch Rocketship School																						
INDEX		9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
PHF		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	19	7	7	17	304	35	0	74	10	104	0	0	53	212	10	0	0	0	0	852
Project Trips		0	0	0	0	0	0	6	0	5	0	50	0	0	60	0	0	0	0	0	0	121
Existing + Project		0	19	7	7	17	304	41	0	79	10	154	0	0	113	212	10	0	0	0	0	973
Cumulative Baseline Conditions		0	19	7	7	17	304	35	0	74	10	104	0	0	54	217	10	0	0	0	0	858
Cumulative + Proj Conditions		0	19	7	7	17	304	41	0	79	10	154	0	0	114	217	10	0	0	0	0	979
Intersection Number: <b>3</b>																						
Synchro Node Number: 3																						
Intersection Name: G Street & East 10th Street																						
Peak Hour: AM																						
Count Date: 02/17/16																						
Scenario: Antioch Rocketship School																						
INDEX		9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
PHF		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	12	112	45	27	467	48	0	35	133	48	0	0	61	264	11	0	0	0	0	1263
Project Trips		0	0	0	26	21	3	24	0	28	0	0	0	0	0	3	0	0	0	0	0	105
Existing + Project		0	12	112	71	48	470	72	0	63	133	48	0	0	61	267	11	0	0	0	0	1368
Cumulative Baseline Conditions		0	19	175	70	27	469	48	0	35	133	48	0	0	61	266	11	0	0	0	0	1362
Cumulative + Proj Conditions		0	19	175	96	48	472	72	0	63	133	48	0	0	61	269	11	0	0	0	0	1467
Intersection Number: <b>4</b>																						
Synchro Node Number: 4																						
Intersection Name: A Street & East 10th Street/Beede Way																						
Peak Hour: AM																						
Count Date: 04/06/17																						
Scenario: Antioch Rocketship School																						
INDEX		9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
PHF		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
User Adjustment		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	137	144	2	8	17	13	0	10	219	229	0	0	193	11	109	0	0	0	0	1092
Project Trips		0	24	6	0	0	0	0	0	0	5	24	0	0	29	0	28	0	0	0	0	116
Existing + Project		0	161	150	2	8	17	13	0	10	224	253	0	0	222	11	137	0	0	0	0	1208
Cumulative Baseline Conditions		0	204	214	3	8	17	13	0	10	219	229	0	0	233	13	132	0	0	0	0	1295
Cumulative + Proj Conditions		0	228	220	3	8	17	13	0	10	224	253	0	0	262	13	160	0	0	0	0	1411

Antioch Rocketship School TIA AM Conditions

Intersection Number:		5																				
Synchro Node Number:		5																				
Intersection Name:		A Street & East 13th Street																				
Peak Hour:		AM		Date of Analysis: 04/18/17																		
Count Date:		04/06/17																				
Scenario:		Antioch Rocketship School																				
Movements																						
Scenario:	North Approach				East Approach				South Approach				West Approach				Southwest Approach				Total	
	RT2	RT	TH	LT	RT	TH	LT	LT2	RT	TH	LT	LT2	RT2	RT	TH	LT	RT2	RT	LT	LT2		
	INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
	PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
	User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	1	321	44	47	0	29	0	75	434	14	0	0	40	0	0	0	0	0	0	1005
Project Trips		0	0	0	35	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
Existing + Project		0	1	321	79	77	0	29	0	75	434	14	0	0	40	0	0	0	0	0	0	1070
Cumulative Baseline Conditions		0	1	393	54	66	0	41	0	75	434	14	0	0	43	0	0	0	0	0	0	1121
Cumulative + Proj Conditions		0	1	393	89	96	0	41	0	75	434	14	0	0	43	0	0	0	0	0	0	1186
Intersection Number:		6																				
Synchro Node Number:		6																				
Intersection Name:		Cavallo Road & East 13th Street																				
Peak Hour:		AM		Date of Analysis: 04/18/17																		
Count Date:		04/06/17																				
Scenario:		Antioch Rocketship School																				
Movements																						
Scenario:	North Approach				East Approach				South Approach				West Approach				Southwest Approach				Total	
	RT2	RT	TH	LT	RT	TH	LT	LT2	RT	TH	LT	LT2	RT2	RT	TH	LT	RT2	RT	LT	LT2		
	INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
	PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
	User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	26	141	0	0	0	0	0	0	183	35	0	0	98	0	26	0	0	0	0	509
Project Trips		0	0	66	0	0	0	0	0	0	55	51	0	0	60	0	0	0	0	0	0	232
Existing + Project		0	26	207	0	0	0	0	0	0	238	86	0	0	158	0	26	0	0	0	0	741
Cumulative Baseline Conditions		0	26	143	0	0	0	0	0	0	183	35	0	0	98	0	26	0	0	0	0	511
Cumulative + Proj Conditions		0	26	209	0	0	0	0	0	0	238	86	0	0	158	0	26	0	0	0	0	743
Intersection Number:		7																				
Synchro Node Number:		7																				
Intersection Name:		G Street & East 18th Street																				
Peak Hour:		AM		Date of Analysis: 04/18/17																		
Count Date:		03/24/16																				
Scenario:		Antioch Rocketship School																				
Movements																						
Scenario:	North Approach				East Approach				South Approach				West Approach				Southwest Approach				Total	
	RT2	RT	TH	LT	RT	TH	LT	LT2	RT	TH	LT	LT2	RT2	RT	TH	LT	RT2	RT	LT	LT2		
	INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
	PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
	User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	133	112	91	51	258	55	0	46	97	154	0	0	151	134	47	0	0	0	0	1329
Project Trips		0	0	0	12	24	3	21	0	10	0	0	0	0	0	3	0	0	0	0	0	73
Existing + Project		0	133	112	103	75	261	76	0	56	97	154	0	0	151	137	47	0	0	0	0	1402
Cumulative Baseline Conditions		0	137	116	94	51	258	55	0	58	123	196	0	0	151	134	47	0	0	0	0	1420
Cumulative + Proj Conditions		0	137	116	106	75	261	76	0	68	123	196	0	0	151	137	47	0	0	0	0	1493

Intersection Number: <b>8</b>																							
Synchro Node Number: 8																							
Intersection Name: A Street & East 18th Street																							
Peak Hour: AM		Date of Analysis: 04/18/17																					
Count Date: 04/06/17																							
Scenario: Antioch Rocketship School																							
		Movements																					
		North Approach				East Approach				South Approach				West Approach				Southwest Approach					
Scenario:		RT2	RT	TH	LT	RT	TH	LT	LT2	RT	TH	LT	LT2	RT2	RT	TH	LT	RT2	RT	LT	LT2	Total	
		INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
		PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
		User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	18	461	92	203	161	246	0	180	545	72	0	0	58	142	64	0	0	0	0	2242	
<b>Project Trips</b>		0	0	0	0	0	48	26	0	31	0	0	0	0	0	57	0	0	0	0	0	162	
Existing + Project		0	18	461	92	203	209	272	0	211	545	72	0	0	58	199	64	0	0	0	0	2404	
Cumulative Baseline Conditions		0	22	566	113	203	161	246	0	180	545	72	0	0	58	142	64	0	0	0	0	2372	
Cumulative + Proj Conditions		0	22	566	113	203	209	272	0	211	545	72	0	0	58	199	64	0	0	0	0	2534	

Intersection Number: <b>9</b>																							
Synchro Node Number: 9																							
Intersection Name: Evergreen Avenue & East 18th Street																							
Peak Hour: AM		Date of Analysis: 04/18/17																					
Count Date: 04/06/17																							
Scenario: Antioch Rocketship School																							
		Movements																					
		North Approach				East Approach				South Approach				West Approach				Southwest Approach					
Scenario:		RT2	RT	TH	LT	RT	TH	LT	LT2	RT	TH	LT	LT2	RT2	RT	TH	LT	RT2	RT	LT	LT2	Total	
		INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
		PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
		User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		23	0	4	7	2	579	0	26	53	1	8	0	0	1	372	21	0	0	0	4	1101	
<b>Project Trips</b>		0	0	0	0	0	74	0	21	25	0	0	0	0	0	88	0	0	0	0	0	208	
Existing + Project		23	0	4	7	2	653	0	47	78	1	8	0	0	1	460	21	0	0	0	4	1309	
Cumulative Baseline Conditions		23	0	4	7	2	579	0	26	64	1	10	0	0	1	372	21	0	0	0	4	1114	
Cumulative + Proj Conditions		23	0	4	7	2	653	0	47	89	1	10	0	0	1	460	21	0	0	0	4	1322	

Intersection Number: <b>10</b>																							
Synchro Node Number: 10																							
Intersection Name: Cavallo Road & East 18th Street																							
Peak Hour: AM		Date of Analysis: 04/18/17																					
Count Date: 04/06/17																							
Scenario: Antioch Rocketship School																							
		Movements																					
		North Approach				East Approach				South Approach				West Approach				Southwest Approach					
Scenario:		RT2	RT	TH	LT	RT	TH	LT	LT2	RT	TH	LT	LT2	RT2	RT	TH	LT	RT2	RT	LT	LT2	Total	
		INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
		PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
		User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	76	98	68	82	438	42	0	34	104	75	0	0	62	247	96	0	0	0	0	1422	
<b>Project Trips</b>		0	95	5	58	69	0	0	0	0	6	0	0	0	0	0	113	0	0	0	0	346	
Existing + Project		0	171	103	126	151	438	42	0	34	110	75	0	0	62	247	209	0	0	0	0	1768	
Cumulative Baseline Conditions		0	77	99	69	82	438	42	0	35	107	77	0	0	62	247	96	0	0	0	0	1431	
Cumulative + Proj Conditions		0	172	104	127	151	438	42	0	35	113	77	0	0	62	247	209	0	0	0	0	1777	

Intersection Number: <b>11</b>																							
Synchro Node Number: 11																							
Intersection Name: Hillcrest Avenue & East 18th Street																							
Peak Hour: AM		Date of Analysis: 04/18/17																					
Count Date: 04/06/17																							
Scenario: Antioch Rocketship School																							
		Movements																					
		North Approach				East Approach				South Approach				West Approach				Southwest Approach					
Scenario:		RT2	RT	TH	LT	RT	TH	LT	LT2	RT	TH	LT	LT2	RT2	RT	TH	LT	RT2	RT	LT	LT2	Total	
		INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
		PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
		User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	28	123	26	18	294	288	0	267	91	231	0	0	152	152	22	0	0	0	0	1692	
<b>Project Trips</b>		0	19	0	0	0	16	0	0	0	0	16	0	0	13	13	16	0	0	0	0	93	
Existing + Project		0	47	123	26	18	310	288	0	267	91	247	0	0	165	165	38	0	0	0	0	1785	
Cumulative Baseline Conditions		0	28	123	26	18	294	288	0	319	109	276	0	0	169	169	24	0	0	0	0	1843	
Cumulative + Proj Conditions		0	47	123	26	18	310	288	0	319	109	292	0	0	182	182	40	0	0	0	0	1936	

Antioch Rocketship School TIA PM Conditions

Scenario:		Movements																Total					
		North Approach				East Approach				South Approach				West Approach				Southwest Approach					
		RT2	RT	TH	LT	RT	TH	LT	LT2	RT	TH	LT	LT2	RT2	RT	TH	LT	RT2	RT	LT	LT2		
Intersection Number:	1																						
Synchro Node Number:	1																						
Intersection Name:	A Street & East 9th Street/Wilbur Avenue																						
Peak Hour:	PM																						
Count Date:	04/06/17																						
Scenario:	Antioch Rocketship School																						
Scenario:	INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18		
	PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
	User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	3	156	225	111	26	101	0	273	155	9	0	0	18	38	2	0	0	0	0	1117	
Project Trips		0	0	3	13	18	0	17	0	12	4	0	0	0	0	0	0	0	0	0	0	67	
Existing + Project		0	3	159	238	129	26	118	0	285	159	9	0	0	18	38	2	0	0	0	0	1184	
Cumulative Baseline Volumes		0	3	156	225	113	27	103	0	329	187	11	0	0	18	38	2	0	0	0	0	1212	
Cumulative + Proj Conditions		0	3	159	238	131	27	120	0	341	191	11	0	0	18	38	2	0	0	0	0	1279	
Intersection Number:	2																						
Synchro Node Number:	2																						
Intersection Name:	Cavallo Road & Wilbur Avenue																						
Peak Hour:	PM																						
Count Date:	04/06/17																						
Scenario:	Antioch Rocketship School																						
Scenario:	INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18		
	PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
	User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	17	16	18	15	150	58	0	95	25	60	0	0	78	379	23	0	0	0	0	934	
Project Trips		0	0	0	0	0	0	2	0	4	0	35	0	0	25	0	0	0	0	0	0	66	
Existing + Project		0	17	16	18	15	150	60	0	99	25	95	0	0	103	379	23	0	0	0	0	1000	
Cumulative Baseline Volumes		0	17	16	18	15	150	58	0	98	26	62	0	0	78	379	23	0	0	0	0	940	
Cumulative + Proj Conditions		0	17	16	18	15	150	60	0	102	26	97	0	0	103	379	23	0	0	0	0	1006	
Intersection Number:	3																						
Synchro Node Number:	3																						
Intersection Name:	G Street & East 10th Street																						
Peak Hour:	PM																						
Count Date:	02/17/16																						
Scenario:	Antioch Rocketship School																						
Scenario:	INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18		
	PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
	User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	46	97	88	29	278	16	0	20	49	14	0	0	27	479	32	0	0	0	0	1175	
Project Trips		0	0	0	10	15	2	16	0	12	0	0	0	0	0	1	0	0	0	0	0	56	
Existing + Project		0	46	97	98	44	280	32	0	32	49	14	0	0	27	480	32	0	0	0	0	1231	
Cumulative Baseline Volumes		0	46	97	88	29	278	16	0	24	59	17	0	0	27	479	32	0	0	0	0	1192	
Cumulative + Proj Conditions		0	46	97	98	44	280	32	0	36	59	17	0	0	27	480	32	0	0	0	0	1248	
Intersection Number:	4																						
Synchro Node Number:	4																						
Intersection Name:	A Street & East 10th Street/Beede Way																						
Peak Hour:	PM																						
Count Date:	04/06/17																						
Scenario:	Antioch Rocketship School																						
Scenario:	INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18		
	PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
	User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	58	232	1	7	5	17	0	19	239	166	0	0	264	4	195	0	0	0	0	1207	
Project Trips		0	17	3	0	0	0	0	0	0	4	17	0	0	11	0	12	0	0	0	0	64	
Existing + Project		0	75	235	1	7	5	17	0	19	243	183	0	0	275	4	207	0	0	0	0	1271	
Cumulative Baseline Volumes		0	68	272	1	7	5	17	0	19	239	166	0	0	264	4	195	0	0	0	0	1257	
Cumulative + Proj Conditions		0	85	275	1	7	5	17	0	19	243	183	0	0	275	4	207	0	0	0	0	1321	

Antioch Rocketship School TIA PM Conditions

Intersection Number:		5																					
Synchro Node Number:		5																					
Intersection Name:		A Street & East 13th Street		Date of Analysis: 04/18/17																			
Peak Hour:		PM																					
Count Date:		04/06/17																					
Scenario:		Antioch Rocketship School																					
		Movements																					
		North Approach				East Approach				South Approach				West Approach				Southwest Approach					
Scenario:		RT2	RT	TH	LT	RT	TH	LT	LT2	RT	TH	LT	LT2	RT2	RT	TH	LT	RT2	RT	LT	LT2	Total	
		INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
		PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
		User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	0	522	22	18	0	19	0	30	440	2	0	0	11	0	0	0	0	0	0	1064	
Project Trips		0	0	0	14	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	
Existing + Project		0	0	522	36	39	0	19	0	30	440	2	0	0	11	0	0	0	0	0	0	1099	
Cumulative Baseline Volumes		0	0	522	22	18	0	19	0	32	467	2	0	0	11	0	0	0	0	0	0	1093	
Cumulative + Proj Conditions		0	0	522	36	39	0	19	0	32	467	2	0	0	11	0	0	0	0	0	0	1128	
Intersection Number:		6																					
Synchro Node Number:		6																					
Intersection Name:		Cavallo Road & East 13th Street		Date of Analysis: 04/18/17																			
Peak Hour:		PM																					
Count Date:		04/06/17																					
Scenario:		Antioch Rocketship School																					
		Movements																					
		North Approach				East Approach				South Approach				West Approach				Southwest Approach					
Scenario:		RT2	RT	TH	LT	RT	TH	LT	LT2	RT	TH	LT	LT2	RT2	RT	TH	LT	RT2	RT	LT	LT2	Total	
		INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
		PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
		User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	10	182	0	0	0	0	0	0	182	29	0	0	33	0	11	0	0	0	0	447	
Project Trips		0	0	27	0	0	0	0	0	0	39	35	0	0	24	0	0	0	0	0	0	125	
Existing + Project		0	10	209	0	0	0	0	0	0	221	64	0	0	57	0	11	0	0	0	0	572	
Cumulative Baseline Volumes		0	10	182	0	0	0	0	0	0	186	30	0	0	33	0	11	0	0	0	0	452	
Cumulative + Proj Conditions		0	10	209	0	0	0	0	0	0	225	65	0	0	57	0	11	0	0	0	0	577	
Intersection Number:		7																					
Synchro Node Number:		7																					
Intersection Name:		G Street & East 18th Street		Date of Analysis: 04/18/17																			
Peak Hour:		PM																					
Count Date:		03/24/16																					
Scenario:		Antioch Rocketship School																					
		Movements																					
		North Approach				East Approach				South Approach				West Approach				Southwest Approach					
Scenario:		RT2	RT	TH	LT	RT	TH	LT	LT2	RT	TH	LT	LT2	RT2	RT	TH	LT	RT2	RT	LT	LT2	Total	
		INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
		PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
		User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	54	102	44	72	355	87	0	71	94	16	0	0	37	373	51	0	0	0	0	1356	
Project Trips		0	0	0	12	16	2	15	0	10	0	0	0	0	0	1	0	0	0	0	0	56	
Existing + Project		0	54	102	56	88	357	102	0	81	94	16	0	0	37	374	51	0	0	0	0	1412	
Cumulative Baseline Volumes		0	107	203	87	72	355	87	0	74	98	17	0	0	37	373	51	0	0	0	0	1561	
Cumulative + Proj Conditions		0	107	203	99	88	357	102	0	84	98	17	0	0	37	374	51	0	0	0	0	1617	
Intersection Number:		8																					
Synchro Node Number:		8																					
Intersection Name:		A Street & East 18th Street		Date of Analysis: 04/18/17																			
Peak Hour:		PM																					
Count Date:		04/06/17																					
Scenario:		Antioch Rocketship School																					
		Movements																					
		North Approach				East Approach				South Approach				West Approach				Southwest Approach					
Scenario:		RT2	RT	TH	LT	RT	TH	LT	LT2	RT	TH	LT	LT2	RT2	RT	TH	LT	RT2	RT	LT	LT2	Total	
		INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
		PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
		User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	18	481	168	142	155	305	0	245	393	79	0	0	53	227	91	0	0	0	0	2357	
Project Trips		0	0	0	0	0	33	19	0	13	0	0	0	0	0	23	0	0	0	0	0	88	
Existing + Project		0	18	481	168	142	188	324	0	258	393	79	0	0	53	250	91	0	0	0	0	2445	
Cumulative Baseline Volumes		0	18	481	168	147	160	316	0	282	453	91	0	0	53	227	91	0	0	0	0	2487	
Cumulative + Proj Conditions		0	18	481	168	147	193	335	0	295	453	91	0	0	53	250	91	0	0	0	0	2575	

Antioch Rocketship School TIA PM Conditions

Intersection Number:		9																					
Synchro Node Number:		9																					
Intersection Name:		Evergreen Avenue & East 18th Street													Date of Analysis: 04/18/17								
Peak Hour:		PM																					
Count Date:		04/06/17																					
Scenario:		Antioch Rocketship School																					
		Movements																					
		North Approach				East Approach				South Approach				West Approach				Southwest Approach					
Scenario:		RT2	RT	TH	LT	RT	TH	LT	LT2	RT	TH	LT	LT2	RT2	RT	TH	LT	RT2	RT	LT	LT2	Total	
		INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
		PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
		User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		31	0	3	22	10	527	0	13	17	2	7	0	0	0	594	41	10	0	0	2	1279	
Project Trips		0	0	0	0	0	52	0	15	10	0	0	0	0	0	36	0	0	0	0	0	113	
Existing + Project		31	0	3	22	10	579	0	28	27	2	7	0	0	0	630	41	10	0	0	2	1392	
Cumulative Baseline Volumes		31	0	3	22	11	578	0	14	27	3	11	0	0	0	594	41	10	0	0	2	1347	
Cumulative + Proj Conditions		31	0	3	22	11	630	0	29	37	3	11	0	0	0	630	41	10	0	0	2	1460	
Intersection Number:		10																					
Synchro Node Number:		10																					
Intersection Name:		Cavallo Road & East 18th Street													Date of Analysis: 04/18/17								
Peak Hour:		PM																					
Count Date:		04/06/17																					
Scenario:		Antioch Rocketship School																					
		Movements																					
		North Approach				East Approach				South Approach				West Approach				Southwest Approach					
Scenario:		RT2	RT	TH	LT	RT	TH	LT	LT2	RT	TH	LT	LT2	RT2	RT	TH	LT	RT2	RT	LT	LT2	Total	
		INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
		PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
		User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	130	105	79	86	344	34	0	44	73	65	0	0	80	406	112	0	0	0	0	1558	
Project Trips		0	67	4	41	28	0	0	0	0	3	0	0	0	0	0	46	0	0	0	0	189	
Existing + Project		0	197	109	120	114	344	34	0	44	76	65	0	0	80	406	158	0	0	0	0	1747	
Cumulative Baseline Volumes		0	130	105	79	104	415	41	0	44	73	65	0	0	80	406	112	0	0	0	0	1654	
Cumulative + Proj Conditions		0	197	109	120	132	415	41	0	44	76	65	0	0	80	406	158	0	0	0	0	1843	
Intersection Number:		11																					
Synchro Node Number:		11																					
Intersection Name:		Hillcrest Avenue & East 18th Street													Date of Analysis: 04/18/17								
Peak Hour:		PM																					
Count Date:		04/06/17																					
Scenario:		Antioch Rocketship School																					
		Movements																					
		North Approach				East Approach				South Approach				West Approach				Southwest Approach					
Scenario:		RT2	RT	TH	LT	RT	TH	LT	LT2	RT	TH	LT	LT2	RT2	RT	TH	LT	RT2	RT	LT	LT2	Total	
		INDEX	9	8	7	6	17	16	15	14	5	4	3	2	13	12	11	10	21	20	19	18	
		PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
		User Adjustment	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Existing Conditions		0	34	112	33	22	218	233	0	329	178	190	0	0	175	296	37	0	0	0	0	1857	
Project Trips		0	8	0	0	0	6	0	0	0	0	6	0	0	9	9	11	0	0	0	0	49	
Existing + Project		0	42	112	33	22	224	233	0	329	178	196	0	0	184	305	48	0	0	0	0	1906	
Cumulative Baseline Volumes		0	34	112	33	26	260	278	0	420	227	242	0	0	175	296	37	0	0	0	0	2140	
Cumulative + Proj Conditions		0	42	112	33	26	266	278	0	420	227	248	0	0	184	305	48	0	0	0	0	2189	























## **Appendix C**

### **Intersection Level of Service Calculations**
























HCM 2010 Signalized Intersection Summary  
 1: A Street & W. 9th Street/Wilbur Avenue

Existing AM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	19	13	180	51	205	8	139	186	72	84	5
Future Volume (veh/h)	3	19	13	180	51	205	8	139	186	72	84	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1900	1900	1845	1845	1900	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	3	21	14	200	57	228	9	154	207	80	93	0
Adj No. of Lanes	0	1	0	0	1	1	0	1	1	1	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	32	225	150	326	93	370	61	399	348	146	666	566
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.22	0.22	0.22	0.08	0.36	0.00
Sat Flow, veh/h	136	954	636	1382	394	1568	35	1794	1568	1757	1845	1568
Grp Volume(v), veh/h	38	0	0	257	0	228	163	0	207	80	93	0
Grp Sat Flow(s),veh/h/ln	1726	0	0	1776	0	1568	1829	0	1568	1757	1845	1568
Q Serve(g_s), s	1.2	0.0	0.0	9.3	0.0	9.4	0.0	0.0	8.5	3.1	2.4	0.0
Cycle Q Clear(g_c), s	1.2	0.0	0.0	9.3	0.0	9.4	5.4	0.0	8.5	3.1	2.4	0.0
Prop In Lane	0.08		0.37	0.78		1.00	0.06		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	407	0	0	419	0	370	459	0	348	146	666	566
V/C Ratio(X)	0.09	0.00	0.00	0.61	0.00	0.62	0.35	0.00	0.59	0.55	0.14	0.00
Avail Cap(c_a), veh/h	407	0	0	419	0	370	459	0	348	146	666	566
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.5	0.0	0.0	24.6	0.0	24.6	23.9	0.0	25.1	31.7	15.5	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	6.6	0.0	7.5	2.1	0.0	7.3	13.9	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	5.3	0.0	4.8	3.0	0.0	4.4	2.1	1.3	0.0
LnGrp Delay(d),s/veh	21.9	0.0	0.0	31.1	0.0	32.1	26.0	0.0	32.4	45.6	15.9	0.0
LnGrp LOS	C			C		C	C		C	D	B	
Approach Vol, veh/h		38			485			370			173	
Approach Delay, s/veh		21.9			31.6			29.6			29.6	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.0	20.0		21.0		30.0		21.0				
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	6.0	16.0		17.0		26.0		17.0				
Max Q Clear Time (g_c+I1), s	5.1	10.5		3.2		4.4		11.4				
Green Ext Time (p_c), s	0.0	1.1		0.1		2.1		1.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				30.2								
HCM 2010 LOS				C								




















HCM 2010 Signalized Intersection Summary  
 2: Cavallo Road/Fulton Shipyard Road & Wilbur Avenue

Existing AM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	212	53	35	304	17	104	10	74	7	7	19
Future Volume (veh/h)	10	212	53	35	304	17	104	10	74	7	7	19
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1845	1845	1845	1845	1845	1845	1900
Adj Flow Rate, veh/h	11	236	59	39	338	19	116	11	82	8	8	21
Adj No. of Lanes	1	2	0	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	107	1141	280	183	834	709	382	529	450	107	59	154
Arrive On Green	0.06	0.41	0.41	0.10	0.45	0.45	0.22	0.29	0.29	0.06	0.13	0.13
Sat Flow, veh/h	1757	2792	684	1757	1845	1568	1757	1845	1568	1757	451	1184
Grp Volume(v), veh/h	11	146	149	39	338	19	116	11	82	8	0	29
Grp Sat Flow(s),veh/h/ln	1757	1752	1724	1757	1845	1568	1757	1845	1568	1757	0	1636
Q Serve(g_s), s	0.7	6.2	6.4	2.3	14.1	0.8	6.4	0.5	4.5	0.5	0.0	1.8
Cycle Q Clear(g_c), s	0.7	6.2	6.4	2.3	14.1	0.8	6.4	0.5	4.5	0.5	0.0	1.8
Prop In Lane	1.00		0.40	1.00		1.00	1.00		1.00	1.00		0.72
Lane Grp Cap(c), veh/h	107	716	705	183	834	709	382	529	450	107	0	213
V/C Ratio(X)	0.10	0.20	0.21	0.21	0.41	0.03	0.30	0.02	0.18	0.07	0.00	0.14
Avail Cap(c_a), veh/h	107	716	705	183	834	709	382	529	450	107	0	213
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.0	21.9	22.0	47.2	21.1	17.5	37.7	29.4	30.8	50.9	0.0	44.3
Incr Delay (d2), s/veh	1.9	0.6	0.7	2.6	1.5	0.1	2.0	0.1	0.9	1.4	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.1	3.2	1.3	7.5	0.3	3.3	0.3	2.1	0.3	0.0	0.9
LnGrp Delay(d),s/veh	53.0	22.6	22.7	49.8	22.6	17.5	39.7	29.5	31.7	52.3	0.0	45.6
LnGrp LOS	D	C	C	D	C	B	D	C	C	D		D
Approach Vol, veh/h		306			396			209				37
Approach Delay, s/veh		23.7			25.0			36.1				47.0
Approach LOS		C			C			D				D
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	37.0	16.0	51.0	29.0	19.0	11.0	56.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	7.0	33.0	12.0	47.0	25.0	15.0	7.0	52.0				
Max Q Clear Time (g_c+I1), s	2.5	6.5	4.3	8.4	8.4	3.8	2.7	16.1				
Green Ext Time (p_c), s	0.0	0.4	0.0	4.4	0.2	0.3	0.0	4.4				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				27.9								
HCM 2010 LOS				C								



















HCM 2010 Signalized Intersection Summary  
3: G Street & W. 10th Street

Existing AM Conditions  
07/13/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	264	61	48	467	27	48	133	35	45	112	12
Future Volume (veh/h)	11	264	61	48	467	27	48	133	35	45	112	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1900
Adj Flow Rate, veh/h	12	278	64	51	492	28	51	140	37	47	118	13
Adj No. of Lanes	0	1	1	0	1	1	0	1	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	75	989	862	119	918	862	176	435	497	172	390	38
Arrive On Green	0.55	0.55	0.55	0.55	0.55	0.55	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	22	1798	1568	97	1669	1568	317	1374	1568	304	1232	121
Grp Volume(v), veh/h	290	0	64	543	0	28	191	0	37	178	0	0
Grp Sat Flow(s),veh/h/ln	1820	0	1568	1767	0	1568	1691	0	1568	1656	0	0
Q Serve(g_s), s	0.0	0.0	1.1	0.0	0.0	0.5	0.0	0.0	1.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.0	0.0	1.1	11.3	0.0	0.5	4.7	0.0	1.0	4.4	0.0	0.0
Prop In Lane	0.04		1.00	0.09		1.00	0.27		1.00	0.26		0.07
Lane Grp Cap(c), veh/h	1063	0	862	1037	0	862	611	0	497	600	0	0
V/C Ratio(X)	0.27	0.00	0.07	0.52	0.00	0.03	0.31	0.00	0.07	0.30	0.00	0.00
Avail Cap(c_a), veh/h	1063	0	862	1037	0	862	611	0	497	600	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.2	0.0	6.3	8.6	0.0	6.2	15.6	0.0	14.3	15.5	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.2	1.9	0.0	0.1	1.3	0.0	0.3	1.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	0.5	6.1	0.0	0.2	2.6	0.0	0.5	2.4	0.0	0.0
LnGrp Delay(d),s/veh	7.8	0.0	6.5	10.5	0.0	6.3	17.0	0.0	14.6	16.8	0.0	0.0
LnGrp LOS	A		A	B		A	B		B	B		
Approach Vol, veh/h		354			571			228			178	
Approach Delay, s/veh		7.6			10.3			16.6			16.8	
Approach LOS		A			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.0		37.0		23.0		37.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		19.0		33.0		19.0		33.0				
Max Q Clear Time (g_c+I1), s		6.7		7.0		6.4		13.3				
Green Ext Time (p_c), s		1.8		6.4		1.9		5.8				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				11.5								
HCM 2010 LOS				B								

HCM 2010 Signalized Intersection Summary  
4: A Street & W. 10th Street/Beede Way

Existing AM Conditions  
07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	11	193	13	17	8	229	219	10	2	144	137
Future Volume (veh/h)	109	11	193	13	17	8	229	219	10	2	144	137
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1900	1845	1900	1845	1845	1900	1900	1845	1900
Adj Flow Rate, veh/h	118	12	0	14	18	9	249	238	11	2	157	149
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	410	430	0	46	60	30	527	1896	87	41	388	301
Arrive On Green	0.23	0.23	0.00	0.08	0.08	0.08	0.30	0.56	0.56	0.21	0.21	0.21
Sat Flow, veh/h	1757	1845	0	597	767	384	1757	3412	157	5	1837	1427
Grp Volume(v), veh/h	118	12	0	41	0	0	249	122	127	159	0	149
Grp Sat Flow(s),veh/h/ln	1757	1845	0	1747	0	0	1757	1752	1817	1842	0	1427
Q Serve(g_s), s	5.0	0.5	0.0	2.0	0.0	0.0	10.4	3.0	3.0	0.0	0.0	8.3
Cycle Q Clear(g_c), s	5.0	0.5	0.0	2.0	0.0	0.0	10.4	3.0	3.0	6.7	0.0	8.3
Prop In Lane	1.00		0.00	0.34		0.22	1.00		0.09	0.01		1.00
Lane Grp Cap(c), veh/h	410	430	0	136	0	0	527	974	1009	429	0	301
V/C Ratio(X)	0.29	0.03	0.00	0.30	0.00	0.00	0.47	0.13	0.13	0.37	0.00	0.49
Avail Cap(c_a), veh/h	410	430	0	136	0	0	527	974	1009	429	0	301
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.4	26.6	0.0	39.2	0.0	0.0	25.7	9.6	9.6	30.6	0.0	31.3
Incr Delay (d2), s/veh	1.8	0.1	0.0	5.6	0.0	0.0	3.0	0.3	0.3	2.4	0.0	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.2	0.0	1.2	0.0	0.0	5.5	1.5	1.6	3.7	0.0	3.7
LnGrp Delay(d),s/veh	30.1	26.7	0.0	44.8	0.0	0.0	28.7	9.8	9.8	33.1	0.0	37.0
LnGrp LOS	C	C		D			C	A	A	C		D
Approach Vol, veh/h		130			41			498			308	
Approach Delay, s/veh		29.8			44.8			19.3			35.0	
Approach LOS		C			D			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		54.0		25.0	31.0	23.0		11.0				
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s		50.0		21.0	27.0	19.0		7.0				
Max Q Clear Time (g_c+I1), s		5.0		7.0	12.4	10.3		4.0				
Green Ext Time (p_c), s		3.8		0.3	0.6	2.2		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			26.7									
HCM 2010 LOS			C									

**Intersection**

Int Delay, s/veh 2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	40	29	0	47	14	434	75	44	321	1
Future Vol, veh/h	0	0	40	29	0	47	14	434	75	44	321	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	43	32	0	51	15	472	82	48	349	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	711	1029	175	813	989	277	350	0	0	553	0	0
Stage 1	445	445	-	543	543	-	-	-	-	-	-	-
Stage 2	266	584	-	270	446	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	318	231	835	268	244	717	1198	-	-	1006	-	-
Stage 1	559	570	-	489	515	-	-	-	-	-	-	-
Stage 2	714	494	-	710	570	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	278	213	835	239	225	717	1198	-	-	1006	-	-
Mov Cap-2 Maneuver	278	213	-	239	225	-	-	-	-	-	-	-
Stage 1	549	536	-	480	506	-	-	-	-	-	-	-
Stage 2	651	485	-	633	536	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	16.1	0.2	1.2
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1198	-	-	835	407	1006	-	-
HCM Lane V/C Ratio	0.013	-	-	0.052	0.203	0.048	-	-
HCM Control Delay (s)	8	-	-	9.5	16.1	8.8	0.2	-
HCM Lane LOS	A	-	-	A	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.8	0.1	-	-

**Intersection**

Int Delay, s/veh 3.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	26	98	35	183	141	26
Future Vol, veh/h	26	98	35	183	141	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	175	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	29	109	39	203	157	29

























Major/Minor	Minor2	Major1		Major2
Conflicting Flow All	452	171	186	0
Stage 1	171	-	-	-
Stage 2	281	-	-	-
Critical Hdwy	6.43	6.23	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-
Pot Cap-1 Maneuver	564	870	1382	-
Stage 1	857	-	-	-
Stage 2	764	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	548	870	1382	-
Mov Cap-2 Maneuver	548	-	-	-
Stage 1	857	-	-	-
Stage 2	742	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.6	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1382	-	775	-	-
HCM Lane V/C Ratio	0.028	-	0.178	-	-
HCM Control Delay (s)	7.7	-	10.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

HCM 2010 Signalized Intersection Summary  
7: G Street & W. 18th Street
























Existing AM Conditions  
07/13/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	134	151	55	258	51	154	97	46	91	112	133
Future Volume (veh/h)	47	134	151	55	258	51	154	97	46	91	112	133
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1845	1845	1845	1900	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	51	146	0	60	280	0	167	105	0	99	122	145
Adj No. of Lanes	1	1	1	1	1	1	0	1	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	73	408	347	81	417	354	227	143	324	148	182	286
Arrive On Green	0.04	0.22	0.00	0.05	0.23	0.00	0.21	0.21	0.00	0.18	0.18	0.18
Sat Flow, veh/h	1757	1845	1568	1757	1845	1568	1099	691	1568	808	996	1568
Grp Volume(v), veh/h	51	146	0	60	280	0	272	0	0	221	0	145
Grp Sat Flow(s),veh/h/ln	1757	1845	1568	1757	1845	1568	1790	0	1568	1804	0	1568
Q Serve(g_s), s	1.3	3.1	0.0	1.6	6.5	0.0	6.6	0.0	0.0	5.3	0.0	3.9
Cycle Q Clear(g_c), s	1.3	3.1	0.0	1.6	6.5	0.0	6.6	0.0	0.0	5.3	0.0	3.9
Prop In Lane	1.00		1.00	1.00		1.00	0.61		1.00	0.45		1.00
Lane Grp Cap(c), veh/h	73	408	347	81	417	354	370	0	324	330	0	286
V/C Ratio(X)	0.70	0.36	0.00	0.74	0.67	0.00	0.74	0.00	0.00	0.67	0.00	0.51
Avail Cap(c_a), veh/h	188	831	706	188	831	706	652	0	572	619	0	538
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.1	15.4	0.0	22.0	16.5	0.0	17.3	0.0	0.0	17.7	0.0	17.2
Incr Delay (d2), s/veh	11.5	0.5	0.0	12.1	1.9	0.0	2.9	0.0	0.0	2.4	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.6	0.0	1.0	3.5	0.0	3.5	0.0	0.0	2.9	0.0	1.8
LnGrp Delay(d),s/veh	33.5	15.9	0.0	34.1	18.4	0.0	20.2	0.0	0.0	20.1	0.0	18.5
LnGrp LOS	C	B		C	B		C			C		B
Approach Vol, veh/h		197			340			272				366
Approach Delay, s/veh		20.5			21.1			20.2				19.5
Approach LOS		C			C			C				B
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.6	6.2	14.3		12.5	5.9	14.5				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	5.0	21.0		16.0	5.0	21.0				
Max Q Clear Time (g_c+I1), s		8.6	3.6	5.1		7.3	3.3	8.5				
Green Ext Time (p_c), s		1.0	0.0	2.3		1.2	0.0	2.1				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			20.3									
HCM 2010 LOS			C									



HCM Signalized Intersection Capacity Analysis  
 8: A Street & W. 18th Street/E. 18th Street

Existing AM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	142	58	246	161	203	72	545	180	92	461	18
Future Volume (vph)	64	142	58	246	161	203	72	545	180	92	461	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1764		1665	1733	1568	1752	3505	1568	1752	3485	
Flt Permitted	0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1764		1665	1733	1568	1752	3505	1568	1752	3485	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	70	154	63	267	175	221	78	592	196	100	501	20
RTOR Reduction (vph)	0	13	0	0	0	169	0	0	137	0	2	0
Lane Group Flow (vph)	70	204	0	216	226	52	78	592	59	100	519	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	25.0	25.0		28.0	28.0	28.0	12.0	36.0	36.0	15.0	39.0	
Effective Green, g (s)	25.0	25.0		28.0	28.0	28.0	12.0	36.0	36.0	15.0	39.0	
Actuated g/C Ratio	0.21	0.21		0.23	0.23	0.23	0.10	0.30	0.30	0.12	0.32	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	365	367		388	404	365	175	1051	470	219	1132	
v/s Ratio Prot	0.04	c0.12		0.13	c0.13		0.04	c0.17		c0.06	c0.15	
v/s Ratio Perm						0.03			0.04			
v/c Ratio	0.19	0.56		0.56	0.56	0.14	0.45	0.56	0.13	0.46	0.46	
Uniform Delay, d1	39.2	42.5		40.5	40.6	36.5	50.9	35.4	30.5	48.7	32.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	6.0		5.7	5.5	0.8	8.0	2.2	0.5	6.7	1.3	
Delay (s)	40.3	48.5		46.2	46.1	37.3	58.9	37.6	31.1	55.4	33.5	
Level of Service	D	D		D	D	D	E	D	C	E	C	
Approach Delay (s)		46.5			43.2			38.0			37.0	
Approach LOS		D			D			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			40.2	HCM 2000 Level of Service				D				
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			120.0	Sum of lost time (s)				16.0				
Intersection Capacity Utilization			55.5%	ICU Level of Service				B				
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 9: Service Road & Evergreen Avenue/Driveway & E. 18th Street

Existing AM Conditions  
 07/12/2017



Movement	EBL	EBT	EBR	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Traffic Volume (vph)	21	372	1	26	579	2	8	1	53	7	4	23
Future Volume (vph)	21	372	1	26	579	2	8	1	53	7	4	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.88			0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1752	3504		1752	3503			1622			1658	
Flt Permitted	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (perm)	1752	3504		1752	3503			1622			1658	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	404	1	28	629	2	9	1	58	8	4	25
RTOR Reduction (vph)	0	0	0	0	0	0	0	51	0	0	34	0
Lane Group Flow (vph)	23	405	0	28	631	0	0	17	0	0	3	0
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	7	4		3	8		5	5		6	6	
Permitted Phases												
Actuated Green, G (s)	10.0	39.0		11.0	40.0			12.0			7.0	
Effective Green, g (s)	10.0	39.0		11.0	40.0			12.0			7.0	
Actuated g/C Ratio	0.10	0.39		0.11	0.40			0.12			0.07	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	175	1366		192	1401			194			116	
v/s Ratio Prot	0.01	0.12		c0.02	c0.18			c0.01			c0.00	
v/s Ratio Perm												
v/c Ratio	0.13	0.30		0.15	0.45			0.09			0.02	
Uniform Delay, d1	41.0	21.0		40.3	22.0			39.1			43.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.6	0.6		1.6	1.0			0.9			0.4	
Delay (s)	42.6	21.6		41.8	23.0			40.0			43.7	
Level of Service	D	C		D	C			D			D	
Approach Delay (s)		22.7			23.8			40.0			43.7	
Approach LOS		C			C			D			D	

Intersection Summary		
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.26	
Actuated Cycle Length (s)	100.0	Sum of lost time (s) 20.0
Intersection Capacity Utilization	40.2%	ICU Level of Service A
Analysis Period (min)	15	

c Critical Lane Group























Movement	NEL2	NEL
Lane Configurations		
Traffic Volume (vph)	4	0
Future Volume (vph)	4	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		4.0
Lane Util. Factor		1.00
Frt		1.00
Flt Protected		0.95
Satd. Flow (prot)		1752
Flt Permitted		0.95
Satd. Flow (perm)		1752
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	4	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	4
Turn Type	Prot	Prot
Protected Phases	2	2
Permitted Phases		
Actuated Green, G (s)		11.0
Effective Green, g (s)		11.0
Actuated g/C Ratio		0.11
Clearance Time (s)		4.0
Vehicle Extension (s)		3.0
Lane Grp Cap (vph)		192
v/s Ratio Prot		c0.00
v/s Ratio Perm		
v/c Ratio		0.02
Uniform Delay, d1		39.7
Progression Factor		1.00
Incremental Delay, d2		0.2
Delay (s)		39.9
Level of Service		D
Approach Delay (s)		39.9
Approach LOS		D

Intersection Summary























HCM 2010 Signalized Intersection Summary  
 10: Cavallo Road & E. 18th Street

Existing AM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	247	62	42	438	82	75	104	34	68	98	76
Future Volume (veh/h)	96	247	62	42	438	82	75	104	34	68	98	76
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	104	268	67	46	476	89	82	113	37	74	107	83
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	351	1151	283	220	996	185	357	416	136	394	301	234
Arrive On Green	0.20	0.41	0.41	0.13	0.34	0.34	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1757	2791	685	1757	2951	549	1177	1332	436	1220	964	748
Grp Volume(v), veh/h	104	166	169	46	282	283	82	0	150	74	0	190
Grp Sat Flow(s),veh/h/ln	1757	1752	1724	1757	1752	1748	1177	0	1768	1220	0	1713
Q Serve(g_s), s	4.0	4.9	5.1	1.9	10.1	10.3	4.6	0.0	5.1	3.9	0.0	6.9
Cycle Q Clear(g_c), s	4.0	4.9	5.1	1.9	10.1	10.3	11.5	0.0	5.1	9.0	0.0	6.9
Prop In Lane	1.00		0.40	1.00		0.31	1.00		0.25	1.00		0.44
Lane Grp Cap(c), veh/h	351	723	711	220	591	590	357	0	552	394	0	535
V/C Ratio(X)	0.30	0.23	0.24	0.21	0.48	0.48	0.23	0.00	0.27	0.19	0.00	0.36
Avail Cap(c_a), veh/h	351	723	711	220	591	590	357	0	552	394	0	535
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.2	15.3	15.3	31.4	20.9	21.0	25.7	0.0	20.7	24.0	0.0	21.3
Incr Delay (d2), s/veh	2.1	0.7	0.8	2.2	2.7	2.8	1.5	0.0	1.2	1.1	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	2.5	2.5	1.0	5.3	5.4	1.7	0.0	2.7	1.4	0.0	3.5
LnGrp Delay(d),s/veh	29.4	16.0	16.1	33.6	23.7	23.7	27.2	0.0	21.9	25.1	0.0	23.1
LnGrp LOS	C	B	B	C	C	C	C		C	C		C
Approach Vol, veh/h		439			611			232				264
Approach Delay, s/veh		19.2			24.4			23.8				23.7
Approach LOS		B			C			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		29.0	14.0	37.0		29.0	20.0	31.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		25.0	10.0	33.0		25.0	16.0	27.0				
Max Q Clear Time (g_c+I1), s		13.5	3.9	7.1		11.0	6.0	12.3				
Green Ext Time (p_c), s		2.0	0.0	6.0		2.2	0.2	4.9				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				22.7								
HCM 2010 LOS				C								

HCM Signalized Intersection Capacity Analysis  
 11: Hillcrest Avenue & E. 18th Street

Existing AM Conditions  
 07/12/2017





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	152	152	288	294	18	231	91	267	26	123	28
Future Volume (vph)	22	152	152	288	294	18	231	91	267	26	123	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3242		1752	3474		1665	1715	1568	1752	1845	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	3242		1752	3474		1665	1715	1568	1752	1845	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	165	165	313	320	20	251	99	290	28	134	30
RTOR Reduction (vph)	0	143	0	0	4	0	0	0	213	0	0	25
Lane Group Flow (vph)	24	187	0	313	336	0	173	177	77	28	134	5
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			6
Actuated Green, G (s)	5.0	14.0		31.0	40.0		28.0	28.0	28.0	16.0	16.0	16.0
Effective Green, g (s)	5.0	14.0		31.0	40.0		28.0	28.0	28.0	16.0	16.0	16.0
Actuated g/C Ratio	0.05	0.13		0.30	0.38		0.27	0.27	0.27	0.15	0.15	0.15
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	83	432		517	1323		444	457	418	266	281	238
v/s Ratio Prot	0.01	c0.06		c0.18	0.10		c0.10	0.10		0.02	c0.07	
v/s Ratio Perm									0.05			0.00
v/c Ratio	0.29	0.43		0.61	0.25		0.39	0.39	0.19	0.11	0.48	0.02
Uniform Delay, d1	48.3	41.8		31.8	22.3		31.5	31.5	29.7	38.3	40.7	37.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.6	3.1		5.2	0.5		2.6	2.5	1.0	0.8	5.7	0.1
Delay (s)	56.9	45.0		36.9	22.7		34.1	34.0	30.7	39.1	46.4	38.0
Level of Service	E	D		D	C		C	C	C	D	D	D
Approach Delay (s)		45.8			29.5			32.5			44.0	
Approach LOS		D			C			C			D	

Intersection Summary		
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.49	
Actuated Cycle Length (s)	105.0	Sum of lost time (s) 16.0
Intersection Capacity Utilization	53.6%	ICU Level of Service A
Analysis Period (min)	15	

c Critical Lane Group
























HCM 2010 Signalized Intersection Summary  
 1: A Street & W. 9th Street/Wilbur Avenue

Existing PM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	38	18	101	26	111	9	155	273	225	156	3
Future Volume (veh/h)	2	38	18	101	26	111	9	155	273	225	156	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1900	1900	1845	1845	1900	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	2	41	20	110	28	121	10	168	297	245	170	0
Adj No. of Lanes	0	1	0	0	1	1	0	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	10	203	99	253	64	281	50	489	429	351	951	809
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.27	0.27	0.27	0.20	0.52	0.00
Sat Flow, veh/h	55	1135	554	1414	360	1568	37	1788	1568	1757	1845	1568
Grp Volume(v), veh/h	63	0	0	138	0	121	178	0	297	245	170	0
Grp Sat Flow(s),veh/h/ln	1744	0	0	1774	0	1568	1825	0	1568	1757	1845	1568
Q Serve(g_s), s	2.9	0.0	0.0	6.6	0.0	6.5	0.0	0.0	16.1	12.3	4.7	0.0
Cycle Q Clear(g_c), s	2.9	0.0	0.0	6.6	0.0	6.5	7.4	0.0	16.1	12.3	4.7	0.0
Prop In Lane	0.03		0.32	0.80		1.00	0.06		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	312	0	0	317	0	281	539	0	429	351	951	809
V/C Ratio(X)	0.20	0.00	0.00	0.43	0.00	0.43	0.33	0.00	0.69	0.70	0.18	0.00
Avail Cap(c_a), veh/h	312	0	0	317	0	281	539	0	429	351	951	809
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.2	0.0	0.0	34.7	0.0	34.7	27.7	0.0	30.9	35.3	12.3	0.0
Incr Delay (d2), s/veh	1.5	0.0	0.0	4.3	0.0	4.8	1.6	0.0	8.9	10.9	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	3.6	0.0	3.2	4.0	0.0	8.0	7.1	2.5	0.0
LnGrp Delay(d),s/veh	34.7	0.0	0.0	39.0	0.0	39.5	29.4	0.0	39.8	46.3	12.7	0.0
LnGrp LOS	C			D		D	C		D	D	B	
Approach Vol, veh/h		63			259			475			415	
Approach Delay, s/veh		34.7			39.2			35.9			32.5	
Approach LOS		C			D			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	23.0	30.0		21.0		53.0		21.0				
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	19.0	26.0		17.0		49.0		17.0				
Max Q Clear Time (g_c+I1), s	14.3	18.1		4.9		6.7		8.6				
Green Ext Time (p_c), s	0.3	2.0		0.2		3.3		0.7				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				35.4								
HCM 2010 LOS				D								




















HCM 2010 Signalized Intersection Summary  
 2: Cavallo Road/Fulton Shipyard Road & Wilbur Avenue

Existing PM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	379	78	58	150	15	60	25	95	18	16	17
Future Volume (veh/h)	23	379	78	58	150	15	60	25	95	18	16	17
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1845	1845	1845	1845	1845	1845	1900
Adj Flow Rate, veh/h	26	421	87	64	167	17	67	28	106	20	18	19
Adj No. of Lanes	1	2	0	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	141	927	190	234	689	585	164	492	418	117	197	208
Arrive On Green	0.08	0.32	0.32	0.13	0.37	0.37	0.09	0.27	0.27	0.07	0.24	0.24
Sat Flow, veh/h	1757	2898	594	1757	1845	1568	1757	1845	1568	1757	823	869
Grp Volume(v), veh/h	26	253	255	64	167	17	67	28	106	20	0	37
Grp Sat Flow(s),veh/h/ln	1757	1752	1740	1757	1845	1568	1757	1845	1568	1757	0	1691
Q Serve(g_s), s	1.0	8.6	8.7	2.5	4.7	0.5	2.7	0.8	4.0	0.8	0.0	1.3
Cycle Q Clear(g_c), s	1.0	8.6	8.7	2.5	4.7	0.5	2.7	0.8	4.0	0.8	0.0	1.3
Prop In Lane	1.00		0.34	1.00		1.00	1.00		1.00	1.00		0.51
Lane Grp Cap(c), veh/h	141	561	557	234	689	585	164	492	418	117	0	406
V/C Ratio(X)	0.18	0.45	0.46	0.27	0.24	0.03	0.41	0.06	0.25	0.17	0.00	0.09
Avail Cap(c_a), veh/h	141	561	557	234	689	585	164	492	418	117	0	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.2	20.3	20.3	29.2	16.2	14.9	32.0	20.5	21.6	33.0	0.0	22.1
Incr Delay (d2), s/veh	2.9	2.6	2.7	2.9	0.8	0.1	7.4	0.2	1.5	3.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	4.6	4.6	1.4	2.5	0.2	1.6	0.5	1.9	0.5	0.0	0.6
LnGrp Delay(d),s/veh	35.1	22.9	23.0	32.1	17.0	15.0	39.4	20.7	23.1	36.2	0.0	22.6
LnGrp LOS	D	C	C	C	B	B	D	C	C	D		C
Approach Vol, veh/h		534			248			201			57	
Approach Delay, s/veh		23.5			20.8			28.2			27.4	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.0	24.0	14.0	28.0	11.0	22.0	10.0	32.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	5.0	20.0	10.0	24.0	7.0	18.0	6.0	28.0				
Max Q Clear Time (g_c+I1), s	2.8	6.0	4.5	10.7	4.7	3.3	3.0	6.7				
Green Ext Time (p_c), s	0.0	0.5	0.0	3.5	0.0	0.5	0.0	4.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			24.0									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary  
3: G Street & W. 10th Street



















Existing PM Conditions  
07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	479	27	16	278	29	14	49	20	88	97	46
Future Volume (veh/h)	32	479	27	16	278	29	14	49	20	88	97	46
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1900
Adj Flow Rate, veh/h	35	521	29	17	302	32	15	53	22	96	105	50
Adj No. of Lanes	0	1	1	0	1	1	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	112	895	801	100	908	801	164	473	488	254	255	99
Arrive On Green	0.51	0.51	0.51	0.51	0.51	0.51	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	52	1751	1568	31	1776	1568	213	1521	1568	460	821	319
Grp Volume(v), veh/h	556	0	29	319	0	32	68	0	22	251	0	0
Grp Sat Flow(s),veh/h/ln	1803	0	1568	1808	0	1568	1734	0	1568	1599	0	0
Q Serve(g_s), s	0.0	0.0	0.4	0.0	0.0	0.5	0.0	0.0	0.4	2.3	0.0	0.0
Cycle Q Clear(g_c), s	9.5	0.0	0.4	4.6	0.0	0.5	1.2	0.0	0.4	5.4	0.0	0.0
Prop In Lane	0.06		1.00	0.05		1.00	0.22		1.00	0.38		0.20
Lane Grp Cap(c), veh/h	1007	0	801	1008	0	801	637	0	488	608	0	0
V/C Ratio(X)	0.55	0.00	0.04	0.32	0.00	0.04	0.11	0.00	0.05	0.41	0.00	0.00
Avail Cap(c_a), veh/h	1007	0	801	1008	0	801	637	0	488	608	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.7	0.0	5.5	6.5	0.0	5.5	11.1	0.0	10.8	12.5	0.0	0.0
Incr Delay (d2), s/veh	2.2	0.0	0.1	0.8	0.0	0.1	0.3	0.0	0.2	2.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	0.0	0.2	2.5	0.0	0.2	0.7	0.0	0.2	2.9	0.0	0.0
LnGrp Delay(d),s/veh	9.9	0.0	5.6	7.3	0.0	5.6	11.4	0.0	11.0	14.5	0.0	0.0
LnGrp LOS	A		A	A		A	B		B	B		
Approach Vol, veh/h		585			351			90			251	
Approach Delay, s/veh		9.7			7.2			11.3			14.5	
Approach LOS		A			A			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		18.0		27.0		18.0		27.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		14.0		23.0		14.0		23.0				
Max Q Clear Time (g_c+I1), s		3.2		11.5		7.4		6.6				
Green Ext Time (p_c), s		1.4		4.6		1.0		5.6				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			10.1									
HCM 2010 LOS			B									



HCM 2010 Signalized Intersection Summary  
4: A Street & W. 10th Street/Beede Way

Existing PM Conditions  
07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	4	264	17	5	7	166	239	19	1	232	58
Future Volume (veh/h)	195	4	264	17	5	7	166	239	19	1	232	58
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1900	1845	1900	1845	1845	1900	1900	1845	1900
Adj Flow Rate, veh/h	212	4	0	18	5	8	180	260	21	1	252	63
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	509	535	0	80	22	35	422	1676	134	37	629	153
Arrive On Green	0.29	0.29	0.00	0.08	0.08	0.08	0.24	0.51	0.51	0.23	0.23	0.23
Sat Flow, veh/h	1757	1845	0	997	277	443	1757	3287	264	2	2735	667
Grp Volume(v), veh/h	212	4	0	31	0	0	180	138	143	169	0	147
Grp Sat Flow(s),veh/h/ln	1757	1845	0	1717	0	0	1757	1752	1798	1843	0	1561
Q Serve(g_s), s	9.7	0.2	0.0	1.7	0.0	0.0	8.7	4.2	4.2	0.0	0.0	8.0
Cycle Q Clear(g_c), s	9.7	0.2	0.0	1.7	0.0	0.0	8.7	4.2	4.2	7.7	0.0	8.0
Prop In Lane	1.00		0.00	0.58		0.26	1.00		0.15	0.01		0.43
Lane Grp Cap(c), veh/h	509	535	0	137	0	0	422	894	917	460	0	359
V/C Ratio(X)	0.42	0.01	0.00	0.23	0.00	0.00	0.43	0.15	0.16	0.37	0.00	0.41
Avail Cap(c_a), veh/h	509	535	0	137	0	0	422	894	917	460	0	359
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.7	25.3	0.0	43.1	0.0	0.0	32.2	13.0	13.0	32.6	0.0	32.7
Incr Delay (d2), s/veh	2.5	0.0	0.0	3.8	0.0	0.0	3.1	0.4	0.4	2.2	0.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.1	0.0	0.9	0.0	0.0	4.6	2.1	2.2	4.2	0.0	3.8
LnGrp Delay(d),s/veh	31.2	25.3	0.0	46.9	0.0	0.0	35.3	13.4	13.4	34.9	0.0	36.2
LnGrp LOS	C	C		D			D	B	B	C		D
Approach Vol, veh/h		216			31			461			316	
Approach Delay, s/veh		31.0			46.9			22.0			35.5	
Approach LOS		C			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		55.0		33.0	28.0	27.0		12.0				
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s		51.0		29.0	24.0	23.0		8.0				
Max Q Clear Time (g_c+I1), s		6.2		11.7	10.7	10.0		3.7				
Green Ext Time (p_c), s		4.0		0.6	0.4	2.9		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				28.8								
HCM 2010 LOS				C								

**Intersection**

Int Delay, s/veh 0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	11	19	0	18	2	440	30	22	522	0
Future Vol, veh/h	0	0	11	19	0	18	2	440	30	22	522	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	12	21	0	20	2	478	33	24	567	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	858	1130	284	831	1114	255	567	0	0	511	0	0
Stage 1	615	615	-	499	499	-	-	-	-	-	-	-
Stage 2	243	515	-	332	615	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	249	201	710	260	205	741	994	-	-	1043	-	0
Stage 1	443	478	-	519	539	-	-	-	-	-	-	0
Stage 2	736	531	-	652	478	-	-	-	-	-	-	0
Platoon blocked, %												
Mov Cap-1 Maneuver	236	194	710	248	197	741	994	-	-	1043	-	-
Mov Cap-2 Maneuver	236	194	-	248	197	-	-	-	-	-	-	-
Stage 1	442	462	-	517	537	-	-	-	-	-	-	-
Stage 2	714	529	-	619	462	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.2	16	0	0.4
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT
Capacity (veh/h)	994	-	-	710	367	1043	-
HCM Lane V/C Ratio	0.002	-	-	0.017	0.11	0.023	-
HCM Control Delay (s)	8.6	-	-	10.2	16	8.5	0.1
HCM Lane LOS	A	-	-	B	C	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	0.4	0.1	-

**Intersection**

Int Delay, s/veh 1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	33	29	182	182	10
Future Vol, veh/h	11	33	29	182	182	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	175	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	12	37	32	202	202	11





















Major/Minor	Minor2	Major1		Major2
Conflicting Flow All	475	208	213	0
Stage 1	208	-	-	-
Stage 2	267	-	-	-
Critical Hdwy	7.13	6.23	4.13	-
Critical Hdwy Stg 1	6.13	-	-	-
Critical Hdwy Stg 2	6.13	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-
Pot Cap-1 Maneuver	498	830	1351	-
Stage 1	792	-	-	-
Stage 2	736	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	489	830	1351	-
Mov Cap-2 Maneuver	489	-	-	-
Stage 1	773	-	-	-
Stage 2	719	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1351	-	707	-	-
HCM Lane V/C Ratio	0.024	-	0.069	-	-
HCM Control Delay (s)	7.7	-	10.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

HCM 2010 Signalized Intersection Summary  
7: G Street & W. 18th Street

Existing PM Conditions  
07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	373	37	87	355	72	16	94	71	44	102	54
Future Volume (veh/h)	51	373	37	87	355	72	16	94	71	44	102	54
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1900	1900	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	55	405	0	95	386	0	17	102	77	48	111	59
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	146	584	0	176	615	0	44	262	261	82	190	235
Arrive On Green	0.08	0.32	0.00	0.10	0.33	0.00	0.17	0.17	0.17	0.15	0.15	0.15
Sat Flow, veh/h	1757	1845	0	1757	1845	0	262	1570	1568	549	1269	1568
Grp Volume(v), veh/h	55	405	0	95	386	0	119	0	77	159	0	59
Grp Sat Flow(s),veh/h/ln	1757	1845	0	1757	1845	0	1832	0	1568	1817	0	1568
Q Serve(g_s), s	1.8	11.5	0.0	3.1	10.6	0.0	3.5	0.0	2.6	4.9	0.0	2.0
Cycle Q Clear(g_c), s	1.8	11.5	0.0	3.1	10.6	0.0	3.5	0.0	2.6	4.9	0.0	2.0
Prop In Lane	1.00		0.00	1.00		0.00	0.14		1.00	0.30		1.00
Lane Grp Cap(c), veh/h	146	584	0	176	615	0	305	0	261	273	0	235
V/C Ratio(X)	0.38	0.69	0.00	0.54	0.63	0.00	0.39	0.00	0.29	0.58	0.00	0.25
Avail Cap(c_a), veh/h	146	584	0	176	615	0	305	0	261	273	0	235
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.0	17.9	0.0	25.7	16.9	0.0	22.3	0.0	21.9	23.8	0.0	22.5
Incr Delay (d2), s/veh	7.2	6.6	0.0	11.4	4.8	0.0	3.7	0.0	2.9	8.8	0.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	6.9	0.0	2.1	6.2	0.0	2.1	0.0	1.3	3.1	0.0	1.0
LnGrp Delay(d),s/veh	33.2	24.6	0.0	37.1	21.7	0.0	26.0	0.0	24.8	32.6	0.0	25.1
LnGrp LOS	C	C		D	C		C		C	C		C
Approach Vol, veh/h		460			481			196			218	
Approach Delay, s/veh		25.6			24.7			25.5			30.5	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		14.0	10.0	23.0		13.0	9.0	24.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		10.0	6.0	19.0		9.0	5.0	20.0				
Max Q Clear Time (g_c+I1), s		5.5	5.1	13.5		6.9	3.8	12.6				
Green Ext Time (p_c), s		0.3	0.0	2.3		0.2	0.0	2.9				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				26.1								
HCM 2010 LOS				C								

HCM Signalized Intersection Capacity Analysis  
 8: A Street & W. 18th Street/E. 18th Street

Existing PM Conditions  
 07/12/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↑↑	↔	↔	↔	↔
Traffic Volume (vph)	91	227	53	305	155	142	79	393	245	168	481	18
Future Volume (vph)	91	227	53	305	155	142	79	393	245	168	481	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1792		1665	1723	1568	1752	3505	1568	1752	3485	
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1792		1665	1723	1568	1752	3505	1568	1752	3485	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	247	58	332	168	154	86	427	266	183	523	20
RTOR Reduction (vph)	0	6	0	0	0	117	0	0	209	0	2	0
Lane Group Flow (vph)	99	299	0	246	254	37	86	427	57	183	541	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	35.0	35.0		32.0	32.0	32.0	13.0	29.0	29.0	23.0	39.0	
Effective Green, g (s)	35.0	35.0		32.0	32.0	32.0	13.0	29.0	29.0	23.0	39.0	
Actuated g/C Ratio	0.26	0.26		0.24	0.24	0.24	0.10	0.21	0.21	0.17	0.29	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	454	464		394	408	371	168	752	336	298	1006	
v/s Ratio Prot	0.06	c0.17		c0.15	0.15		0.05	0.12		c0.10	c0.16	
v/s Ratio Perm						0.02			0.04			
v/c Ratio	0.22	0.64		0.62	0.62	0.10	0.51	0.57	0.17	0.61	0.54	
Uniform Delay, d1	39.3	44.5		46.1	46.1	40.2	58.0	47.4	43.2	51.9	40.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	6.7		7.3	7.0	0.5	10.7	3.1	1.1	9.1	2.1	
Delay (s)	40.4	51.2		53.4	53.1	40.8	68.7	50.5	44.3	61.0	42.5	
Level of Service	D	D		D	D	D	E	D	D	E	D	
Approach Delay (s)		48.6			50.3			50.4			47.1	
Approach LOS		D			D			D			D	

Intersection Summary

HCM 2000 Control Delay	49.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 9: Service Road & Evergreen Avenue/Driveway & E. 18th Street

Existing PM Conditions  
 07/12/2017



Movement	EBL	EBT	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR2	NEL2
Lane Configurations	↖	↗	↖	↗			↕			↕		
Traffic Volume (vph)	41	594	13	527	10	7	2	17	22	3	31	2
Future Volume (vph)	41	594	13	527	10	7	2	17	22	3	31	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0			4.0			4.0		
Lane Util. Factor	1.00	0.95	1.00	0.95			1.00			1.00		
Frt	1.00	1.00	1.00	1.00			0.91			0.92		
Flt Protected	0.95	1.00	0.95	1.00			0.99			0.98		
Satd. Flow (prot)	1752	3505	1752	3495			1661			1673		
Flt Permitted	0.95	1.00	0.95	1.00			0.99			0.98		
Satd. Flow (perm)	1752	3505	1752	3495			1661			1673		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	646	14	573	11	8	2	18	24	3	34	2
RTOR Reduction (vph)	0	0	0	1	0	0	16	0	0	55	0	0
Lane Group Flow (vph)	45	646	14	583	0	0	12	0	0	6	0	0
Turn Type	Prot	NA	Prot	NA		Split	NA		Split	NA		Prot
Protected Phases	7	4	3	8		5	5		6	6		2
Permitted Phases												
Actuated Green, G (s)	10.0	39.0	7.0	36.0			9.0			10.0		
Effective Green, g (s)	10.0	39.0	7.0	36.0			9.0			10.0		
Actuated g/C Ratio	0.10	0.39	0.07	0.36			0.09			0.10		
Clearance Time (s)	4.0	4.0	4.0	4.0			4.0			4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0			3.0			3.0		
Lane Grp Cap (vph)	175	1366	122	1258			149			167		
v/s Ratio Prot	c0.03	c0.18	0.01	0.17			c0.01			c0.00		
v/s Ratio Perm												
v/c Ratio	0.26	0.47	0.11	0.46			0.08			0.04		
Uniform Delay, d1	41.6	22.8	43.6	24.6			41.7			40.6		
Progression Factor	1.00	1.00	1.00	1.00			1.00			1.00		
Incremental Delay, d2	3.5	1.2	1.9	1.2			1.0			0.4		
Delay (s)	45.1	24.0	45.5	25.8			42.7			41.1		
Level of Service	D	C	D	C			D			D		
Approach Delay (s)		25.4		26.3			42.7			41.1		
Approach LOS		C		C			D			D		

Intersection Summary

HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 9: Service Road & Evergreen Avenue/Driveway & E. 18th Street





















Existing PM Conditions  
 07/12/2017



Movement	NEL	NER2
Lane Configurations		
Traffic Volume (vph)	0	10
Future Volume (vph)	0	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frt	0.89	
Flt Protected	0.99	
Satd. Flow (prot)	1621	
Flt Permitted	0.99	
Satd. Flow (perm)	1621	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	0	11
RTOR Reduction (vph)	11	0
Lane Group Flow (vph)	2	0
Turn Type	Prot	
Protected Phases	2	
Permitted Phases		
Actuated Green, G (s)	15.0	
Effective Green, g (s)	15.0	
Actuated g/C Ratio	0.15	
Clearance Time (s)	4.0	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	243	
v/s Ratio Prot	c0.00	
v/s Ratio Perm		
v/c Ratio	0.01	
Uniform Delay, d1	36.2	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	36.2	
Level of Service	D	
Approach Delay (s)	36.2	
Approach LOS	D	
<b>Intersection Summary</b>		

HCM 2010 Signalized Intersection Summary  
 10: Cavallo Road & E. 18th Street

Existing PM Conditions  
 07/12/2017























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	406	80	34	344	86	65	73	44	79	105	130
Future Volume (veh/h)	112	406	80	34	344	86	65	73	44	79	105	130
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	122	441	87	37	374	93	71	79	48	86	114	141
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	351	1096	215	198	802	197	366	390	237	479	272	337
Arrive On Green	0.20	0.38	0.38	0.11	0.29	0.29	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1757	2923	573	1757	2790	686	1109	1076	654	1246	751	929
Grp Volume(v), veh/h	122	263	265	37	233	234	71	0	127	86	0	255
Grp Sat Flow(s),veh/h/ln	1757	1752	1744	1757	1752	1724	1109	0	1729	1246	0	1681
Q Serve(g_s), s	4.8	8.8	9.0	1.5	8.8	8.9	4.1	0.0	4.0	4.1	0.0	9.1
Cycle Q Clear(g_c), s	4.8	8.8	9.0	1.5	8.8	8.9	13.2	0.0	4.0	8.1	0.0	9.1
Prop In Lane	1.00		0.33	1.00		0.40	1.00		0.38	1.00		0.55
Lane Grp Cap(c), veh/h	351	657	654	198	504	496	366	0	627	479	0	609
V/C Ratio(X)	0.35	0.40	0.41	0.19	0.46	0.47	0.19	0.00	0.20	0.18	0.00	0.42
Avail Cap(c_a), veh/h	351	657	654	198	504	496	366	0	627	479	0	609
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.5	18.4	18.4	32.2	23.4	23.5	24.1	0.0	17.5	20.3	0.0	19.2
Incr Delay (d2), s/veh	2.7	1.8	1.9	2.1	3.0	3.2	1.2	0.0	0.7	0.8	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	4.6	4.6	0.9	4.6	4.7	1.4	0.0	2.0	1.5	0.0	4.5
LnGrp Delay(d),s/veh	30.2	20.2	20.3	34.3	26.5	26.7	25.3	0.0	18.3	21.2	0.0	21.3
LnGrp LOS	C	C	C	C	C	C	C		B	C		C
Approach Vol, veh/h		650			504			198				341
Approach Delay, s/veh		22.1			27.1			20.8				21.2
Approach LOS		C			C			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		33.0	13.0	34.0		33.0	20.0	27.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		29.0	9.0	30.0		29.0	16.0	23.0				
Max Q Clear Time (g_c+I1), s		15.2	3.5	11.0		11.1	6.8	10.9				
Green Ext Time (p_c), s		2.5	0.0	6.1		2.8	0.2	4.8				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			23.3									
HCM 2010 LOS			C									



HCM Signalized Intersection Capacity Analysis  
 11: Hillcrest Avenue & E. 18th Street

Existing PM Conditions





















07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	296	175	233	218	22	190	178	329	33	112	34
Future Volume (vph)	37	296	175	233	218	22	190	178	329	33	112	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3310		1752	3457		1665	1744	1568	1752	1845	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	3310		1752	3457		1665	1744	1568	1752	1845	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	322	190	253	237	24	207	193	358	36	122	37
RTOR Reduction (vph)	0	75	0	0	7	0	0	0	258	0	0	32
Lane Group Flow (vph)	40	437	0	253	254	0	186	214	100	36	122	5
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			6
Actuated Green, G (s)	6.0	24.0		27.0	45.0		32.0	32.0	32.0	16.0	16.0	16.0
Effective Green, g (s)	6.0	24.0		27.0	45.0		32.0	32.0	32.0	16.0	16.0	16.0
Actuated g/C Ratio	0.05	0.21		0.23	0.39		0.28	0.28	0.28	0.14	0.14	0.14
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	91	690		411	1352		463	485	436	243	256	218
v/s Ratio Prot	0.02	c0.13		c0.14	0.07		0.11	c0.12		0.02	c0.07	
v/s Ratio Perm									0.06			0.00
v/c Ratio	0.44	0.63		0.62	0.19		0.40	0.44	0.23	0.15	0.48	0.02
Uniform Delay, d1	52.9	41.5		39.4	23.0		33.7	34.1	32.0	43.5	45.6	42.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.7	4.4		6.7	0.3		2.6	2.9	1.2	1.3	6.2	0.2
Delay (s)	67.5	45.9		46.1	23.3		36.3	37.0	33.2	44.8	51.9	43.0
Level of Service	E	D		D	C		D	D	C	D	D	D
Approach Delay (s)		47.4			34.5			35.0			48.9	
Approach LOS		D			C			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			39.6	HCM 2000 Level of Service				D				
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			115.0	Sum of lost time (s)				16.0				
Intersection Capacity Utilization			55.9%	ICU Level of Service				B				
Analysis Period (min)			15									

c Critical Lane Group

HCM 2010 Signalized Intersection Summary  
 1: A Street & W. 9th Street/Wilbur Avenue
























Existing+Project AM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	19	13	204	51	231	8	144	214	104	90	5
Future Volume (veh/h)	3	19	13	204	51	231	8	144	214	104	90	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1900	1900	1845	1845	1900	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	3	21	14	227	57	257	9	160	238	116	100	0
Adj No. of Lanes	0	1	0	0	1	1	0	1	1	1	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	32	225	150	335	84	370	60	399	348	146	666	566
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.22	0.22	0.22	0.08	0.36	0.00
Sat Flow, veh/h	136	954	636	1418	356	1568	34	1796	1568	1757	1845	1568
Grp Volume(v), veh/h	38	0	0	284	0	257	169	0	238	116	100	0
Grp Sat Flow(s),veh/h/ln	1726	0	0	1774	0	1568	1830	0	1568	1757	1845	1568
Q Serve(g_s), s	1.2	0.0	0.0	10.5	0.0	10.8	0.0	0.0	10.0	4.7	2.6	0.0
Cycle Q Clear(g_c), s	1.2	0.0	0.0	10.5	0.0	10.8	5.6	0.0	10.0	4.7	2.6	0.0
Prop In Lane	0.08		0.37	0.80		1.00	0.05		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	407	0	0	419	0	370	459	0	348	146	666	566
V/C Ratio(X)	0.09	0.00	0.00	0.68	0.00	0.69	0.37	0.00	0.68	0.79	0.15	0.00
Avail Cap(c_a), veh/h	407	0	0	419	0	370	459	0	348	146	666	566
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.5	0.0	0.0	25.0	0.0	25.1	24.0	0.0	25.7	32.4	15.5	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	8.5	0.0	10.3	2.3	0.0	10.4	34.3	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	6.1	0.0	5.7	3.2	0.0	5.3	3.7	1.4	0.0
LnGrp Delay(d),s/veh	21.9	0.0	0.0	33.6	0.0	35.4	26.2	0.0	36.1	66.7	16.0	0.0
LnGrp LOS	C			C		D	C		D	E	B	
Approach Vol, veh/h		38			541			407			216	
Approach Delay, s/veh		21.9			34.4			32.0			43.2	
Approach LOS		C			C			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.0	20.0		21.0		30.0		21.0				
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	6.0	16.0		17.0		26.0		17.0				
Max Q Clear Time (g_c+I1), s	6.7	12.0		3.2		4.6		12.8				
Green Ext Time (p_c), s	0.0	0.9		0.1		2.3		1.1				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				34.8								
HCM 2010 LOS				C								

HCM 2010 Signalized Intersection Summary  
 2: Cavallo Road/Fulton Shipyard Road & Wilbur Avenue




















Existing+Project AM Conditions

07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	212	113	41	304	17	154	10	79	7	7	19
Future Volume (veh/h)	10	212	113	41	304	17	154	10	79	7	7	19
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1845	1845	1845	1845	1845	1845	1900
Adj Flow Rate, veh/h	11	236	126	46	338	19	171	11	88	8	8	21
Adj No. of Lanes	1	2	0	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	107	915	472	183	834	709	382	529	450	107	59	154
Arrive On Green	0.06	0.41	0.41	0.10	0.45	0.45	0.22	0.29	0.29	0.06	0.13	0.13
Sat Flow, veh/h	1757	2239	1155	1757	1845	1568	1757	1845	1568	1757	451	1184
Grp Volume(v), veh/h	11	183	179	46	338	19	171	11	88	8	0	29
Grp Sat Flow(s),veh/h/ln	1757	1752	1641	1757	1845	1568	1757	1845	1568	1757	0	1636
Q Serve(g_s), s	0.7	7.9	8.3	2.8	14.1	0.8	9.7	0.5	4.9	0.5	0.0	1.8
Cycle Q Clear(g_c), s	0.7	7.9	8.3	2.8	14.1	0.8	9.7	0.5	4.9	0.5	0.0	1.8
Prop In Lane	1.00		0.70	1.00		1.00	1.00		1.00	1.00		0.72
Lane Grp Cap(c), veh/h	107	716	671	183	834	709	382	529	450	107	0	213
V/C Ratio(X)	0.10	0.26	0.27	0.25	0.41	0.03	0.45	0.02	0.20	0.07	0.00	0.14
Avail Cap(c_a), veh/h	107	716	671	183	834	709	382	529	450	107	0	213
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.0	22.4	22.6	47.4	21.1	17.5	39.0	29.4	31.0	50.9	0.0	44.3
Incr Delay (d2), s/veh	1.9	0.9	1.0	3.3	1.5	0.1	3.8	0.1	1.0	1.4	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.0	4.0	1.5	7.5	0.3	5.1	0.3	2.2	0.3	0.0	0.9
LnGrp Delay(d),s/veh	53.0	23.3	23.5	50.6	22.6	17.5	42.8	29.5	31.9	52.3	0.0	45.6
LnGrp LOS	D	C	C	D	C	B	D	C	C	D		D
Approach Vol, veh/h		373			403			270				37
Approach Delay, s/veh		24.3			25.6			38.7				47.0
Approach LOS		C			C			D				D
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	37.0	16.0	51.0	29.0	19.0	11.0	56.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	7.0	33.0	12.0	47.0	25.0	15.0	7.0	52.0				
Max Q Clear Time (g_c+I1), s	2.5	6.9	4.8	10.3	11.7	3.8	2.7	16.1				
Green Ext Time (p_c), s	0.0	0.5	0.0	4.9	0.4	0.3	0.0	4.9				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			29.1									
HCM 2010 LOS			C									



















HCM 2010 Signalized Intersection Summary  
3: G Street & W. 10th Street

Existing+Project AM Conditions  
07/13/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	283	61	64	483	43	48	133	54	64	112	12
Future Volume (veh/h)	11	283	61	64	483	43	48	133	54	64	112	12
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1900
Adj Flow Rate, veh/h	12	298	64	67	508	45	51	140	57	67	118	13
Adj No. of Lanes	0	1	1	0	1	1	0	1	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	74	990	862	140	881	862	177	438	497	203	325	32
Arrive On Green	0.55	0.55	0.55	0.55	0.55	0.55	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	21	1799	1568	132	1602	1568	319	1382	1568	388	1028	99
Grp Volume(v), veh/h	310	0	64	575	0	45	191	0	57	198	0	0
Grp Sat Flow(s),veh/h/ln	1820	0	1568	1734	0	1568	1702	0	1568	1515	0	0
Q Serve(g_s), s	0.0	0.0	1.1	1.7	0.0	0.8	0.0	0.0	1.5	1.6	0.0	0.0
Cycle Q Clear(g_c), s	5.5	0.0	1.1	12.5	0.0	0.8	4.7	0.0	1.5	6.3	0.0	0.0
Prop In Lane	0.04		1.00	0.12		1.00	0.27		1.00	0.34		0.07
Lane Grp Cap(c), veh/h	1063	0	862	1021	0	862	615	0	497	560	0	0
V/C Ratio(X)	0.29	0.00	0.07	0.56	0.00	0.05	0.31	0.00	0.11	0.35	0.00	0.00
Avail Cap(c_a), veh/h	1063	0	862	1021	0	862	615	0	497	560	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.3	0.0	6.3	8.8	0.0	6.3	15.6	0.0	14.5	15.9	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.0	0.2	2.2	0.0	0.1	1.3	0.0	0.5	1.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	0.5	6.7	0.0	0.4	2.6	0.0	0.7	2.9	0.0	0.0
LnGrp Delay(d),s/veh	8.0	0.0	6.5	11.1	0.0	6.4	16.9	0.0	15.0	17.7	0.0	0.0
LnGrp LOS	A		A	B		A	B		B	B		
Approach Vol, veh/h		374			620			248			198	
Approach Delay, s/veh		7.7			10.7			16.5			17.7	
Approach LOS		A			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.0		37.0		23.0		37.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		19.0		33.0		19.0		33.0				
Max Q Clear Time (g_c+I1), s		6.7		7.5		8.3		14.5				
Green Ext Time (p_c), s		2.0		7.0		1.9		6.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			11.9									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary  
4: A Street & W. 10th Street/Beede Way

Existing+Project AM Conditions  
07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	137	11	222	13	17	8	253	224	10	2	150	161
Future Volume (veh/h)	137	11	222	13	17	8	253	224	10	2	150	161
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1900	1845	1900	1845	1845	1900	1900	1845	1900
Adj Flow Rate, veh/h	149	12	0	14	18	9	275	243	11	2	163	175
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	410	430	0	46	60	30	527	1898	86	41	388	301
Arrive On Green	0.23	0.23	0.00	0.08	0.08	0.08	0.30	0.56	0.56	0.21	0.21	0.21
Sat Flow, veh/h	1757	1845	0	597	767	384	1757	3416	154	5	1837	1427
Grp Volume(v), veh/h	149	12	0	41	0	0	275	124	130	165	0	175
Grp Sat Flow(s),veh/h/ln	1757	1845	0	1747	0	0	1757	1752	1817	1842	0	1427
Q Serve(g_s), s	6.4	0.5	0.0	2.0	0.0	0.0	11.7	3.1	3.1	0.0	0.0	9.9
Cycle Q Clear(g_c), s	6.4	0.5	0.0	2.0	0.0	0.0	11.7	3.1	3.1	7.0	0.0	9.9
Prop In Lane	1.00		0.00	0.34		0.22	1.00		0.08	0.01		1.00
Lane Grp Cap(c), veh/h	410	430	0	136	0	0	527	974	1010	429	0	301
V/C Ratio(X)	0.36	0.03	0.00	0.30	0.00	0.00	0.52	0.13	0.13	0.38	0.00	0.58
Avail Cap(c_a), veh/h	410	430	0	136	0	0	527	974	1010	429	0	301
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.9	26.6	0.0	39.2	0.0	0.0	26.1	9.6	9.6	30.8	0.0	31.9
Incr Delay (d2), s/veh	2.5	0.1	0.0	5.6	0.0	0.0	3.7	0.3	0.3	2.6	0.0	7.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	0.2	0.0	1.2	0.0	0.0	6.2	1.5	1.6	3.8	0.0	4.6
LnGrp Delay(d),s/veh	31.4	26.7	0.0	44.8	0.0	0.0	29.8	9.8	9.8	33.4	0.0	39.9
LnGrp LOS	C	C		D			C	A	A	C		D
Approach Vol, veh/h		161			41			529			340	
Approach Delay, s/veh		31.0			44.8			20.2			36.7	
Approach LOS		C			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		54.0		25.0	31.0	23.0		11.0				
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s		50.0		21.0	27.0	19.0		7.0				
Max Q Clear Time (g_c+I1), s		5.1		8.4	13.7	11.9		4.0				
Green Ext Time (p_c), s		4.1		0.3	0.7	2.1		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			28.0									
HCM 2010 LOS			C									

**Intersection**

Int Delay, s/veh 2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	40	29	0	77	14	434	75	79	321	1
Future Vol, veh/h	0	0	40	29	0	77	14	434	75	79	321	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	43	32	0	84	15	472	82	86	349	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	787	1105	175	889	1065	277	350	0	0	553	0	0
Stage 1	521	521	-	543	543	-	-	-	-	-	-	-
Stage 2	266	584	-	346	522	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	280	208	835	236	220	717	1198	-	-	1006	-	-
Stage 1	504	527	-	489	515	-	-	-	-	-	-	-
Stage 2	714	494	-	640	527	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	224	183	835	203	193	717	1198	-	-	1006	-	-
Mov Cap-2 Maneuver	224	183	-	203	193	-	-	-	-	-	-	-
Stage 1	495	471	-	480	506	-	-	-	-	-	-	-
Stage 2	619	485	-	542	471	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	16.6	0.2	2
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1198	-	-	835	424	1006	-	-
HCM Lane V/C Ratio	0.013	-	-	0.052	0.272	0.085	-	-
HCM Control Delay (s)	8	-	-	9.5	16.6	8.9	0.3	-
HCM Lane LOS	A	-	-	A	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	1.1	0.3	-	-

**Intersection**

Int Delay, s/veh 4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	26	158	86	238	207	26
Future Vol, veh/h	26	158	86	238	207	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	175	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	29	176	96	264	230	29























Major/Minor	Minor2	Major1		Major2
Conflicting Flow All	700	244	259	0
Stage 1	244	-	-	-
Stage 2	456	-	-	-
Critical Hdwy	6.43	6.23	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-
Pot Cap-1 Maneuver	404	792	1300	-
Stage 1	794	-	-	-
Stage 2	636	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	374	792	1300	-
Mov Cap-2 Maneuver	374	-	-	-
Stage 1	794	-	-	-
Stage 2	589	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1300	-	684	-	-
HCM Lane V/C Ratio	0.074	-	0.299	-	-
HCM Control Delay (s)	8	-	12.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.3	-	-

HCM 2010 Signalized Intersection Summary  
7: G Street & W. 18th Street

Existing+Project AM Conditions  
07/13/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	153	151	71	274	67	154	97	65	110	112	133
Future Volume (veh/h)	47	153	151	71	274	67	154	97	65	110	112	133
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1845	1845	1845	1900	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	51	166	0	77	298	0	167	105	21	120	122	145
Adj No. of Lanes	1	1	1	1	1	1	0	1	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	72	407	346	96	432	368	225	142	321	171	174	301
Arrive On Green	0.04	0.22	0.00	0.05	0.23	0.00	0.20	0.20	0.20	0.19	0.19	0.19
Sat Flow, veh/h	1757	1845	1568	1757	1845	1568	1099	691	1568	893	907	1568
Grp Volume(v), veh/h	51	166	0	77	298	0	272	0	21	242	0	145
Grp Sat Flow(s),veh/h/ln	1757	1845	1568	1757	1845	1568	1790	0	1568	1800	0	1568
Q Serve(g_s), s	1.4	3.8	0.0	2.1	7.2	0.0	6.9	0.0	0.5	6.1	0.0	4.0
Cycle Q Clear(g_c), s	1.4	3.8	0.0	2.1	7.2	0.0	6.9	0.0	0.5	6.1	0.0	4.0
Prop In Lane	1.00		1.00	1.00		1.00	0.61		1.00	0.50		1.00
Lane Grp Cap(c), veh/h	72	407	346	96	432	368	367	0	321	345	0	301
V/C Ratio(X)	0.71	0.41	0.00	0.80	0.69	0.00	0.74	0.00	0.07	0.70	0.00	0.48
Avail Cap(c_a), veh/h	180	795	675	180	795	675	624	0	547	591	0	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.1	16.3	0.0	22.8	17.0	0.0	18.2	0.0	15.6	18.4	0.0	17.6
Incr Delay (d2), s/veh	12.1	0.7	0.0	14.0	2.0	0.0	3.0	0.0	0.1	2.6	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.0	0.0	1.4	3.9	0.0	3.7	0.0	0.2	3.3	0.0	1.8
LnGrp Delay(d),s/veh	35.2	16.9	0.0	36.8	19.0	0.0	21.2	0.0	15.7	21.0	0.0	18.8
LnGrp LOS	D	B		D	B		C		B	C		B
Approach Vol, veh/h		217			375			293				387
Approach Delay, s/veh		21.2			22.7			20.8				20.2
Approach LOS		C			C			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		14.0	6.7	14.8		13.3	6.0	15.4				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	5.0	21.0		16.0	5.0	21.0				
Max Q Clear Time (g_c+I1), s		8.9	4.1	5.8		8.1	3.4	9.2				
Green Ext Time (p_c), s		1.0	0.0	2.5		1.2	0.0	2.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			21.2									
HCM 2010 LOS			C									



HCM Signalized Intersection Capacity Analysis  
 8: A Street & W. 18th Street/E. 18th Street

Existing+Project AM Conditions

07/12/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	199	58	272	209	203	72	545	211	92	461	18
Future Volume (vph)	64	199	58	272	209	203	72	545	211	92	461	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1782		1665	1740	1568	1752	3505	1568	1752	3485	
Flt Permitted	0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1782		1665	1740	1568	1752	3505	1568	1752	3485	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	70	216	63	296	227	221	78	592	229	100	501	20
RTOR Reduction (vph)	0	9	0	0	0	169	0	0	160	0	2	0
Lane Group Flow (vph)	70	270	0	258	265	52	78	592	69	100	519	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	25.0	25.0		28.0	28.0	28.0	12.0	36.0	36.0	15.0	39.0	
Effective Green, g (s)	25.0	25.0		28.0	28.0	28.0	12.0	36.0	36.0	15.0	39.0	
Actuated g/C Ratio	0.21	0.21		0.23	0.23	0.23	0.10	0.30	0.30	0.12	0.32	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	365	371		388	406	365	175	1051	470	219	1132	
v/s Ratio Prot	0.04	c0.15		c0.15	0.15		0.04	c0.17		c0.06	c0.15	
v/s Ratio Perm						0.03			0.04			
v/c Ratio	0.19	0.73		0.66	0.65	0.14	0.45	0.56	0.15	0.46	0.46	
Uniform Delay, d1	39.2	44.3		41.7	41.6	36.5	50.9	35.4	30.7	48.7	32.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	11.9		8.7	7.9	0.8	8.0	2.2	0.7	6.7	1.3	
Delay (s)	40.3	56.2		50.4	49.5	37.3	58.9	37.6	31.4	55.4	33.5	
Level of Service	D	E		D	D	D	E	D	C	E	C	
Approach Delay (s)		53.0			46.2			37.8			37.0	
Approach LOS		D			D			D			D	

Intersection Summary

HCM 2000 Control Delay	42.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 9: Service Road & Evergreen Avenue/Driveway & E. 18th Street

Existing+Project AM Conditions

07/12/2017



Movement	EBL	EBT	EBR	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Traffic Volume (vph)	21	460	1	47	653	2	8	1	78	7	4	23
Future Volume (vph)	21	460	1	47	653	2	8	1	78	7	4	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.88			0.91	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1752	3504		1752	3503			1614			1658	
Flt Permitted	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (perm)	1752	3504		1752	3503			1614			1658	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	500	1	51	710	2	9	1	85	8	4	25
RTOR Reduction (vph)	0	0	0	0	0	0	0	75	0	0	34	0
Lane Group Flow (vph)	23	501	0	51	712	0	0	20	0	0	3	0
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	7	4		3	8		5	5		6	6	
Permitted Phases												
Actuated Green, G (s)	10.0	39.0		11.0	40.0			12.0			7.0	
Effective Green, g (s)	10.0	39.0		11.0	40.0			12.0			7.0	
Actuated g/C Ratio	0.10	0.39		0.11	0.40			0.12			0.07	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	175	1366		192	1401			193			116	
v/s Ratio Prot	0.01	0.14		c0.03	c0.20			c0.01			c0.00	
v/s Ratio Perm												
v/c Ratio	0.13	0.37		0.27	0.51			0.10			0.02	
Uniform Delay, d1	41.0	21.7		40.8	22.6			39.2			43.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.6	0.8		3.4	1.3			1.1			0.4	
Delay (s)	42.6	22.5		44.2	23.9			40.3			43.7	
Level of Service	D	C		D	C			D			D	
Approach Delay (s)		23.4			25.3			40.3			43.7	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 9: Service Road & Evergreen Avenue/Driveway & E. 18th Street

Existing+Project AM Conditions





















07/12/2017



Movement	NEL2	NEL
Lane Configurations		
Traffic Volume (vph)	4	0
Future Volume (vph)	4	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		4.0
Lane Util. Factor		1.00
Frt		1.00
Flt Protected		0.95
Satd. Flow (prot)		1752
Flt Permitted		0.95
Satd. Flow (perm)		1752
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	4	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	4
Turn Type	Prot	Prot
Protected Phases	2	2
Permitted Phases		
Actuated Green, G (s)		11.0
Effective Green, g (s)		11.0
Actuated g/C Ratio		0.11
Clearance Time (s)		4.0
Vehicle Extension (s)		3.0
Lane Grp Cap (vph)		192
v/s Ratio Prot		c0.00
v/s Ratio Perm		
v/c Ratio		0.02
Uniform Delay, d1		39.7
Progression Factor		1.00
Incremental Delay, d2		0.2
Delay (s)		39.9
Level of Service		D
Approach Delay (s)		39.9
Approach LOS		D
<b>Intersection Summary</b>		

HCM 2010 Signalized Intersection Summary  
 10: Cavallo Road & E. 18th Street



























Existing+Project AM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	209	247	62	42	438	151	75	110	34	126	103	171
Future Volume (veh/h)	209	247	62	42	438	151	75	110	34	126	103	171
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	227	268	67	46	476	164	82	120	37	137	112	186
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	351	1151	283	220	866	296	263	423	130	388	195	324
Arrive On Green	0.20	0.41	0.41	0.13	0.34	0.34	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1757	2791	685	1757	2565	878	1066	1354	417	1213	625	1037
Grp Volume(v), veh/h	227	166	169	46	324	316	82	0	157	137	0	298
Grp Sat Flow(s),veh/h/ln	1757	1752	1724	1757	1752	1690	1066	0	1771	1213	0	1662
Q Serve(g_s), s	9.5	4.9	5.1	1.9	12.0	12.2	5.6	0.0	5.4	7.7	0.0	12.0
Cycle Q Clear(g_c), s	9.5	4.9	5.1	1.9	12.0	12.2	17.6	0.0	5.4	13.0	0.0	12.0
Prop In Lane	1.00		0.40	1.00		0.52	1.00		0.24	1.00		0.62
Lane Grp Cap(c), veh/h	351	723	711	220	591	570	263	0	553	388	0	519
V/C Ratio(X)	0.65	0.23	0.24	0.21	0.55	0.55	0.31	0.00	0.28	0.35	0.00	0.57
Avail Cap(c_a), veh/h	351	723	711	220	591	570	263	0	553	388	0	519
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.4	15.3	15.3	31.4	21.5	21.6	30.4	0.0	20.7	25.7	0.0	23.0
Incr Delay (d2), s/veh	8.9	0.7	0.8	2.2	3.6	3.8	3.1	0.0	1.3	2.5	0.0	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	2.5	2.5	1.0	6.4	6.2	1.9	0.0	2.8	2.8	0.0	6.1
LnGrp Delay(d),s/veh	38.3	16.0	16.1	33.6	25.2	25.4	33.5	0.0	22.0	28.2	0.0	27.6
LnGrp LOS	D	B	B	C	C	C	C		C	C		C
Approach Vol, veh/h		562			686			239			435	
Approach Delay, s/veh		25.0			25.9			26.0			27.8	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		29.0	14.0	37.0		29.0	20.0	31.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		25.0	10.0	33.0		25.0	16.0	27.0				
Max Q Clear Time (g_c+I1), s		19.6	3.9	7.1		15.0	11.5	14.2				
Green Ext Time (p_c), s		1.8	0.0	6.7		2.7	0.3	5.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				26.1								
HCM 2010 LOS				C								

HCM Signalized Intersection Capacity Analysis  
 11: Hillcrest Avenue & E. 18th Street

Existing+Project AM Conditions

07/12/2017





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 				 
Traffic Volume (vph)	38	165	165	288	310	18	247	91	267	26	123	47
Future Volume (vph)	38	165	165	288	310	18	247	91	267	26	123	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3242		1752	3475		1665	1713	1568	1752	1845	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	3242		1752	3475		1665	1713	1568	1752	1845	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	179	179	313	337	20	268	99	290	28	134	51
RTOR Reduction (vph)	0	155	0	0	4	0	0	0	213	0	0	43
Lane Group Flow (vph)	41	203	0	313	353	0	182	185	77	28	134	8
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			6
Actuated Green, G (s)	5.0	14.0		31.0	40.0		28.0	28.0	28.0	16.0	16.0	16.0
Effective Green, g (s)	5.0	14.0		31.0	40.0		28.0	28.0	28.0	16.0	16.0	16.0
Actuated g/C Ratio	0.05	0.13		0.30	0.38		0.27	0.27	0.27	0.15	0.15	0.15
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	83	432		517	1323		444	456	418	266	281	238
v/s Ratio Prot	0.02	c0.06		c0.18	0.10		c0.11	0.11		0.02	c0.07	
v/s Ratio Perm									0.05			0.00
v/c Ratio	0.49	0.47		0.61	0.27		0.41	0.41	0.19	0.11	0.48	0.03
Uniform Delay, d1	48.8	42.1		31.8	22.4		31.7	31.7	29.7	38.3	40.7	37.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.5	3.6		5.2	0.5		2.8	2.7	1.0	0.8	5.7	0.3
Delay (s)	68.3	45.7		36.9	22.9		34.5	34.3	30.7	39.1	46.4	38.2
Level of Service	E	D		D	C		C	C	C	D	D	D
Approach Delay (s)		48.0			29.5			32.8			43.5	
Approach LOS		D			C			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			35.9				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			105.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			54.9%				ICU Level of Service			A		
Analysis Period (min)			15									

c Critical Lane Group

HCM 2010 Signalized Intersection Summary  
 1: A Street & W. 9th Street/Wilbur Avenue
























Existing+Project PM Conditions

07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	38	18	101	26	111	9	155	273	225	156	3
Future Volume (veh/h)	2	38	18	101	26	111	9	155	273	225	156	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1900	1900	1845	1845	1900	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	2	41	20	110	28	121	10	168	297	245	170	0
Adj No. of Lanes	0	1	0	0	1	1	0	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	10	203	99	253	64	281	50	489	429	351	951	809
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.27	0.27	0.27	0.20	0.52	0.00
Sat Flow, veh/h	55	1135	554	1414	360	1568	37	1788	1568	1757	1845	1568
Grp Volume(v), veh/h	63	0	0	138	0	121	178	0	297	245	170	0
Grp Sat Flow(s),veh/h/ln	1744	0	0	1774	0	1568	1825	0	1568	1757	1845	1568
Q Serve(g_s), s	2.9	0.0	0.0	6.6	0.0	6.5	0.0	0.0	16.1	12.3	4.7	0.0
Cycle Q Clear(g_c), s	2.9	0.0	0.0	6.6	0.0	6.5	7.4	0.0	16.1	12.3	4.7	0.0
Prop In Lane	0.03		0.32	0.80		1.00	0.06		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	312	0	0	317	0	281	539	0	429	351	951	809
V/C Ratio(X)	0.20	0.00	0.00	0.43	0.00	0.43	0.33	0.00	0.69	0.70	0.18	0.00
Avail Cap(c_a), veh/h	312	0	0	317	0	281	539	0	429	351	951	809
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.2	0.0	0.0	34.7	0.0	34.7	27.7	0.0	30.9	35.3	12.3	0.0
Incr Delay (d2), s/veh	1.5	0.0	0.0	4.3	0.0	4.8	1.6	0.0	8.9	10.9	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	3.6	0.0	3.2	4.0	0.0	8.0	7.1	2.5	0.0
LnGrp Delay(d),s/veh	34.7	0.0	0.0	39.0	0.0	39.5	29.4	0.0	39.8	46.3	12.7	0.0
LnGrp LOS	C			D		D	C		D	D	B	
Approach Vol, veh/h		63			259			475			415	
Approach Delay, s/veh		34.7			39.2			35.9			32.5	
Approach LOS		C			D			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	23.0	30.0		21.0		53.0		21.0				
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	19.0	26.0		17.0		49.0		17.0				
Max Q Clear Time (g_c+I1), s	14.3	18.1		4.9		6.7		8.6				
Green Ext Time (p_c), s	0.3	2.0		0.2		3.3		0.7				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				35.4								
HCM 2010 LOS				D								




















HCM 2010 Signalized Intersection Summary  
 2: Cavallo Road/Fulton Shipyard Road & Wilbur Avenue

Existing+Project PM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	379	78	58	150	15	60	25	95	18	16	17
Future Volume (veh/h)	23	379	78	58	150	15	60	25	95	18	16	17
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1845	1845	1845	1845	1845	1845	1900
Adj Flow Rate, veh/h	26	421	87	64	167	17	67	28	106	20	18	19
Adj No. of Lanes	1	2	0	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	141	927	190	234	689	585	164	492	418	117	197	208
Arrive On Green	0.08	0.32	0.32	0.13	0.37	0.37	0.09	0.27	0.27	0.07	0.24	0.24
Sat Flow, veh/h	1757	2898	594	1757	1845	1568	1757	1845	1568	1757	823	869
Grp Volume(v), veh/h	26	253	255	64	167	17	67	28	106	20	0	37
Grp Sat Flow(s),veh/h/ln	1757	1752	1740	1757	1845	1568	1757	1845	1568	1757	0	1691
Q Serve(g_s), s	1.0	8.6	8.7	2.5	4.7	0.5	2.7	0.8	4.0	0.8	0.0	1.3
Cycle Q Clear(g_c), s	1.0	8.6	8.7	2.5	4.7	0.5	2.7	0.8	4.0	0.8	0.0	1.3
Prop In Lane	1.00		0.34	1.00		1.00	1.00		1.00	1.00		0.51
Lane Grp Cap(c), veh/h	141	561	557	234	689	585	164	492	418	117	0	406
V/C Ratio(X)	0.18	0.45	0.46	0.27	0.24	0.03	0.41	0.06	0.25	0.17	0.00	0.09
Avail Cap(c_a), veh/h	141	561	557	234	689	585	164	492	418	117	0	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.2	20.3	20.3	29.2	16.2	14.9	32.0	20.5	21.6	33.0	0.0	22.1
Incr Delay (d2), s/veh	2.9	2.6	2.7	2.9	0.8	0.1	7.4	0.2	1.5	3.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	4.6	4.6	1.4	2.5	0.2	1.6	0.5	1.9	0.5	0.0	0.6
LnGrp Delay(d),s/veh	35.1	22.9	23.0	32.1	17.0	15.0	39.4	20.7	23.1	36.2	0.0	22.6
LnGrp LOS	D	C	C	C	B	B	D	C	C	D		C
Approach Vol, veh/h		534			248			201			57	
Approach Delay, s/veh		23.5			20.8			28.2			27.4	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.0	24.0	14.0	28.0	11.0	22.0	10.0	32.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	5.0	20.0	10.0	24.0	7.0	18.0	6.0	28.0				
Max Q Clear Time (g_c+I1), s	2.8	6.0	4.5	10.7	4.7	3.3	3.0	6.7				
Green Ext Time (p_c), s	0.0	0.5	0.0	3.5	0.0	0.5	0.0	4.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			24.0									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary  
3: G Street & W. 10th Street



















Existing+Project PM Conditions  
07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	480	27	32	280	44	14	49	32	95	97	46
Future Volume (veh/h)	32	480	27	32	280	44	14	49	32	95	97	46
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1900
Adj Flow Rate, veh/h	35	522	29	35	304	48	15	53	35	103	105	50
Adj No. of Lanes	0	1	1	0	1	1	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	112	894	801	129	853	801	164	473	488	262	247	95
Arrive On Green	0.51	0.51	0.51	0.51	0.51	0.51	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	52	1750	1568	80	1669	1568	213	1521	1568	483	793	307
Grp Volume(v), veh/h	557	0	29	339	0	48	68	0	35	258	0	0
Grp Sat Flow(s),veh/h/ln	1802	0	1568	1750	0	1568	1734	0	1568	1583	0	0
Q Serve(g_s), s	0.0	0.0	0.4	0.0	0.0	0.7	0.0	0.0	0.7	2.8	0.0	0.0
Cycle Q Clear(g_c), s	9.5	0.0	0.4	5.0	0.0	0.7	1.2	0.0	0.7	5.7	0.0	0.0
Prop In Lane	0.06		1.00	0.10		1.00	0.22		1.00	0.40		0.19
Lane Grp Cap(c), veh/h	1006	0	801	983	0	801	637	0	488	605	0	0
V/C Ratio(X)	0.55	0.00	0.04	0.35	0.00	0.06	0.11	0.00	0.07	0.43	0.00	0.00
Avail Cap(c_a), veh/h	1006	0	801	983	0	801	637	0	488	605	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.7	0.0	5.5	6.6	0.0	5.5	11.1	0.0	10.9	12.6	0.0	0.0
Incr Delay (d2), s/veh	2.2	0.0	0.1	1.0	0.0	0.1	0.3	0.0	0.3	2.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	0.0	0.2	2.7	0.0	0.3	0.7	0.0	0.3	2.9	0.0	0.0
LnGrp Delay(d),s/veh	9.9	0.0	5.6	7.6	0.0	5.7	11.4	0.0	11.2	14.8	0.0	0.0
LnGrp LOS	A		A	A		A	B		B	B		
Approach Vol, veh/h		586			387			103			258	
Approach Delay, s/veh		9.7			7.3			11.3			14.8	
Approach LOS		A			A			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		18.0		27.0		18.0		27.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		14.0		23.0		14.0		23.0				
Max Q Clear Time (g_c+I1), s		3.2		11.5		7.7		7.0				
Green Ext Time (p_c), s		1.5		4.8		1.1		5.8				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			10.1									
HCM 2010 LOS			B									



HCM 2010 Signalized Intersection Summary  
4: A Street & W. 10th Street/Beede Way

Existing+Project PM Conditions  
07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	4	264	17	5	7	166	239	19	1	232	58
Future Volume (veh/h)	195	4	264	17	5	7	166	239	19	1	232	58
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1900	1845	1900	1845	1845	1900	1900	1845	1900
Adj Flow Rate, veh/h	212	4	0	18	5	8	180	260	21	1	252	63
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	509	535	0	80	22	35	422	1676	134	37	629	153
Arrive On Green	0.29	0.29	0.00	0.08	0.08	0.08	0.24	0.51	0.51	0.23	0.23	0.23
Sat Flow, veh/h	1757	1845	0	997	277	443	1757	3287	264	2	2735	667
Grp Volume(v), veh/h	212	4	0	31	0	0	180	138	143	169	0	147
Grp Sat Flow(s),veh/h/ln	1757	1845	0	1717	0	0	1757	1752	1798	1843	0	1561
Q Serve(g_s), s	9.7	0.2	0.0	1.7	0.0	0.0	8.7	4.2	4.2	0.0	0.0	8.0
Cycle Q Clear(g_c), s	9.7	0.2	0.0	1.7	0.0	0.0	8.7	4.2	4.2	7.7	0.0	8.0
Prop In Lane	1.00		0.00	0.58		0.26	1.00		0.15	0.01		0.43
Lane Grp Cap(c), veh/h	509	535	0	137	0	0	422	894	917	460	0	359
V/C Ratio(X)	0.42	0.01	0.00	0.23	0.00	0.00	0.43	0.15	0.16	0.37	0.00	0.41
Avail Cap(c_a), veh/h	509	535	0	137	0	0	422	894	917	460	0	359
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.7	25.3	0.0	43.1	0.0	0.0	32.2	13.0	13.0	32.6	0.0	32.7
Incr Delay (d2), s/veh	2.5	0.0	0.0	3.8	0.0	0.0	3.1	0.4	0.4	2.2	0.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.1	0.0	0.9	0.0	0.0	4.6	2.1	2.2	4.2	0.0	3.8
LnGrp Delay(d),s/veh	31.2	25.3	0.0	46.9	0.0	0.0	35.3	13.4	13.4	34.9	0.0	36.2
LnGrp LOS	C	C		D			D	B	B	C		D
Approach Vol, veh/h		216			31			461			316	
Approach Delay, s/veh		31.0			46.9			22.0			35.5	
Approach LOS		C			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		55.0		33.0	28.0	27.0		12.0				
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s		51.0		29.0	24.0	23.0		8.0				
Max Q Clear Time (g_c+I1), s		6.2		11.7	10.7	10.0		3.7				
Green Ext Time (p_c), s		4.0		0.6	0.4	2.9		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				28.8								
HCM 2010 LOS				C								

**Intersection**

Int Delay, s/veh 0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	11	19	0	18	2	440	30	22	522	0
Future Vol, veh/h	0	0	11	19	0	18	2	440	30	22	522	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	12	21	0	20	2	478	33	24	567	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	858	1130	284	831	1114	255	567	0	0	511	0	0
Stage 1	615	615	-	499	499	-	-	-	-	-	-	-
Stage 2	243	515	-	332	615	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	249	201	710	260	205	741	994	-	-	1043	-	0
Stage 1	443	478	-	519	539	-	-	-	-	-	-	0
Stage 2	736	531	-	652	478	-	-	-	-	-	-	0
Platoon blocked, %								-	-			
Mov Cap-1 Maneuver	236	194	710	248	197	741	994	-	-	1043	-	-
Mov Cap-2 Maneuver	236	194	-	248	197	-	-	-	-	-	-	-
Stage 1	442	462	-	517	537	-	-	-	-	-	-	-
Stage 2	714	529	-	619	462	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.2	16	0	0.4
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT
Capacity (veh/h)	994	-	-	710	367	1043
HCM Lane V/C Ratio	0.002	-	-	0.017	0.11	0.023
HCM Control Delay (s)	8.6	-	-	10.2	16	8.5
HCM Lane LOS	A	-	-	B	C	A
HCM 95th %tile Q(veh)	0	-	-	0.1	0.4	0.1

**Intersection**

Int Delay, s/veh 1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	33	29	182	182	10
Future Vol, veh/h	11	33	29	182	182	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	175	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	12	37	32	202	202	11





















Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	475	208	213	0	- 0
Stage 1	208	-	-	-	- -
Stage 2	267	-	-	-	- -
Critical Hdwy	6.43	6.23	4.13	-	- -
Critical Hdwy Stg 1	5.43	-	-	-	- -
Critical Hdwy Stg 2	5.43	-	-	-	- -
Follow-up Hdwy	3.527	3.327	2.227	-	- -
Pot Cap-1 Maneuver	546	830	1351	-	- -
Stage 1	824	-	-	-	- -
Stage 2	775	-	-	-	- -
Platoon blocked, %				-	- -
Mov Cap-1 Maneuver	533	830	1351	-	- -
Mov Cap-2 Maneuver	533	-	-	-	- -
Stage 1	824	-	-	-	- -
Stage 2	757	-	-	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	10.3	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1351	-	729	-	-
HCM Lane V/C Ratio	0.024	-	0.067	-	-
HCM Control Delay (s)	7.7	-	10.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

HCM 2010 Signalized Intersection Summary  
7: G Street & W. 18th Street

Existing+Project PM Conditions  
07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	374	37	102	357	88	16	94	81	56	102	54
Future Volume (veh/h)	51	374	37	102	357	88	16	94	81	56	102	54
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1900	1900	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	55	407	0	111	388	0	17	102	88	61	111	59
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	146	584	0	176	615	0	44	262	261	96	175	235
Arrive On Green	0.08	0.32	0.00	0.10	0.33	0.00	0.17	0.17	0.17	0.15	0.15	0.15
Sat Flow, veh/h	1757	1845	0	1757	1845	0	262	1570	1568	643	1170	1568
Grp Volume(v), veh/h	55	407	0	111	388	0	119	0	88	172	0	59
Grp Sat Flow(s),veh/h/ln	1757	1845	0	1757	1845	0	1832	0	1568	1813	0	1568
Q Serve(g_s), s	1.8	11.6	0.0	3.6	10.7	0.0	3.5	0.0	3.0	5.3	0.0	2.0
Cycle Q Clear(g_c), s	1.8	11.6	0.0	3.6	10.7	0.0	3.5	0.0	3.0	5.3	0.0	2.0
Prop In Lane	1.00		0.00	1.00		0.00	0.14		1.00	0.35		1.00
Lane Grp Cap(c), veh/h	146	584	0	176	615	0	305	0	261	272	0	235
V/C Ratio(X)	0.38	0.70	0.00	0.63	0.63	0.00	0.39	0.00	0.34	0.63	0.00	0.25
Avail Cap(c_a), veh/h	146	584	0	176	615	0	305	0	261	272	0	235
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.0	18.0	0.0	25.9	16.9	0.0	22.3	0.0	22.1	23.9	0.0	22.5
Incr Delay (d2), s/veh	7.2	6.7	0.0	16.0	4.9	0.0	3.7	0.0	3.5	10.7	0.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	7.0	0.0	2.5	6.2	0.0	2.1	0.0	1.5	3.5	0.0	1.0
LnGrp Delay(d),s/veh	33.2	24.7	0.0	42.0	21.7	0.0	26.0	0.0	25.5	34.7	0.0	25.1
LnGrp LOS	C	C		D	C		C		C	C		C
Approach Vol, veh/h		462			499			207			231	
Approach Delay, s/veh		25.7			26.2			25.8			32.2	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		14.0	10.0	23.0		13.0	9.0	24.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		10.0	6.0	19.0		9.0	5.0	20.0				
Max Q Clear Time (g_c+I1), s		5.5	5.6	13.6		7.3	3.8	12.7				
Green Ext Time (p_c), s		0.3	0.0	2.3		0.2	0.0	2.9				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			27.0									
HCM 2010 LOS			C									

HCM Signalized Intersection Capacity Analysis  
8: A Street & W. 18th Street/E. 18th Street

Existing+Project PM Conditions

07/12/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔	↔	↔	↑↑	↔	↔	↔	↔
Traffic Volume (vph)	91	227	53	305	155	142	79	393	245	168	481	18
Future Volume (vph)	91	227	53	305	155	142	79	393	245	168	481	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1792		1665	1723	1568	1752	3505	1568	1752	3485	
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1792		1665	1723	1568	1752	3505	1568	1752	3485	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	247	58	332	168	154	86	427	266	183	523	20
RTOR Reduction (vph)	0	6	0	0	0	117	0	0	209	0	2	0
Lane Group Flow (vph)	99	299	0	246	254	37	86	427	57	183	541	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	35.0	35.0		32.0	32.0	32.0	13.0	29.0	29.0	23.0	39.0	
Effective Green, g (s)	35.0	35.0		32.0	32.0	32.0	13.0	29.0	29.0	23.0	39.0	
Actuated g/C Ratio	0.26	0.26		0.24	0.24	0.24	0.10	0.21	0.21	0.17	0.29	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	454	464		394	408	371	168	752	336	298	1006	
v/s Ratio Prot	0.06	c0.17		c0.15	0.15		0.05	0.12		c0.10	c0.16	
v/s Ratio Perm						0.02			0.04			
v/c Ratio	0.22	0.64		0.62	0.62	0.10	0.51	0.57	0.17	0.61	0.54	
Uniform Delay, d1	39.3	44.5		46.1	46.1	40.2	58.0	47.4	43.2	51.9	40.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	6.7		7.3	7.0	0.5	10.7	3.1	1.1	9.1	2.1	
Delay (s)	40.4	51.2		53.4	53.1	40.8	68.7	50.5	44.3	61.0	42.5	
Level of Service	D	D		D	D	D	E	D	D	E	D	
Approach Delay (s)		48.6			50.3			50.4			47.1	
Approach LOS		D			D			D			D	

Intersection Summary

HCM 2000 Control Delay	49.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 9: Service Road & Evergreen Avenue/Driveway & E. 18th Street

Existing+Project PM Conditions

07/12/2017



Movement	EBL	EBT	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR2	NEL2
Lane Configurations												
Traffic Volume (vph)	41	594	13	527	10	7	2	17	22	3	31	2
Future Volume (vph)	41	594	13	527	10	7	2	17	22	3	31	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0			4.0			4.0		
Lane Util. Factor	1.00	0.95	1.00	0.95			1.00			1.00		
Frt	1.00	1.00	1.00	1.00			0.91			0.92		
Flt Protected	0.95	1.00	0.95	1.00			0.99			0.98		
Satd. Flow (prot)	1752	3505	1752	3495			1661			1673		
Flt Permitted	0.95	1.00	0.95	1.00			0.99			0.98		
Satd. Flow (perm)	1752	3505	1752	3495			1661			1673		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	646	14	573	11	8	2	18	24	3	34	2
RTOR Reduction (vph)	0	0	0	1	0	0	16	0	0	55	0	0
Lane Group Flow (vph)	45	646	14	583	0	0	12	0	0	6	0	0
Turn Type	Prot	NA	Prot	NA		Split	NA		Split	NA		Prot
Protected Phases	7	4	3	8		5	5		6	6		2
Permitted Phases												
Actuated Green, G (s)	10.0	39.0	7.0	36.0			9.0			10.0		
Effective Green, g (s)	10.0	39.0	7.0	36.0			9.0			10.0		
Actuated g/C Ratio	0.10	0.39	0.07	0.36			0.09			0.10		
Clearance Time (s)	4.0	4.0	4.0	4.0			4.0			4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0			3.0			3.0		
Lane Grp Cap (vph)	175	1366	122	1258			149			167		
v/s Ratio Prot	c0.03	c0.18	0.01	0.17			c0.01			c0.00		
v/s Ratio Perm												
v/c Ratio	0.26	0.47	0.11	0.46			0.08			0.04		
Uniform Delay, d1	41.6	22.8	43.6	24.6			41.7			40.6		
Progression Factor	1.00	1.00	1.00	1.00			1.00			1.00		
Incremental Delay, d2	3.5	1.2	1.9	1.2			1.0			0.4		
Delay (s)	45.1	24.0	45.5	25.8			42.7			41.1		
Level of Service	D	C	D	C			D			D		
Approach Delay (s)		25.4		26.3			42.7			41.1		
Approach LOS		C		C			D			D		

Intersection Summary

HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 9: Service Road & Evergreen Avenue/Driveway & E. 18th Street

Existing+Project PM Conditions





















07/12/2017



Movement	NEL	NER2
Lane Configurations		
Traffic Volume (vph)	0	10
Future Volume (vph)	0	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frt	0.89	
Flt Protected	0.99	
Satd. Flow (prot)	1621	
Flt Permitted	0.99	
Satd. Flow (perm)	1621	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	0	11
RTOR Reduction (vph)	11	0
Lane Group Flow (vph)	2	0
Turn Type	Prot	
Protected Phases	2	
Permitted Phases		
Actuated Green, G (s)	15.0	
Effective Green, g (s)	15.0	
Actuated g/C Ratio	0.15	
Clearance Time (s)	4.0	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	243	
v/s Ratio Prot	c0.00	
v/s Ratio Perm		
v/c Ratio	0.01	
Uniform Delay, d1	36.2	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	36.2	
Level of Service	D	
Approach Delay (s)	36.2	
Approach LOS	D	
<b>Intersection Summary</b>		

HCM 2010 Signalized Intersection Summary  
 10: Cavallo Road & E. 18th Street

Existing+Project PM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	406	80	34	344	86	65	73	44	79	105	130
Future Volume (veh/h)	112	406	80	34	344	86	65	73	44	79	105	130
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	122	441	87	37	374	93	71	79	48	86	114	141
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	351	1096	215	198	802	197	366	390	237	479	272	337
Arrive On Green	0.20	0.38	0.38	0.11	0.29	0.29	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1757	2923	573	1757	2790	686	1109	1076	654	1246	751	929
Grp Volume(v), veh/h	122	263	265	37	233	234	71	0	127	86	0	255
Grp Sat Flow(s),veh/h/ln	1757	1752	1744	1757	1752	1724	1109	0	1729	1246	0	1681
Q Serve(g_s), s	4.8	8.8	9.0	1.5	8.8	8.9	4.1	0.0	4.0	4.1	0.0	9.1
Cycle Q Clear(g_c), s	4.8	8.8	9.0	1.5	8.8	8.9	13.2	0.0	4.0	8.1	0.0	9.1
Prop In Lane	1.00		0.33	1.00		0.40	1.00		0.38	1.00		0.55
Lane Grp Cap(c), veh/h	351	657	654	198	504	496	366	0	627	479	0	609
V/C Ratio(X)	0.35	0.40	0.41	0.19	0.46	0.47	0.19	0.00	0.20	0.18	0.00	0.42
Avail Cap(c_a), veh/h	351	657	654	198	504	496	366	0	627	479	0	609
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.5	18.4	18.4	32.2	23.4	23.5	24.1	0.0	17.5	20.3	0.0	19.2
Incr Delay (d2), s/veh	2.7	1.8	1.9	2.1	3.0	3.2	1.2	0.0	0.7	0.8	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	4.6	4.6	0.9	4.6	4.7	1.4	0.0	2.0	1.5	0.0	4.5
LnGrp Delay(d),s/veh	30.2	20.2	20.3	34.3	26.5	26.7	25.3	0.0	18.3	21.2	0.0	21.3
LnGrp LOS	C	C	C	C	C	C	C		B	C		C
Approach Vol, veh/h		650			504			198				341
Approach Delay, s/veh		22.1			27.1			20.8				21.2
Approach LOS		C			C			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		33.0	13.0	34.0		33.0	20.0	27.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		29.0	9.0	30.0		29.0	16.0	23.0				
Max Q Clear Time (g_c+I1), s		15.2	3.5	11.0		11.1	6.8	10.9				
Green Ext Time (p_c), s		2.5	0.0	6.1		2.8	0.2	4.8				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			23.3									
HCM 2010 LOS			C									



HCM Signalized Intersection Capacity Analysis  
 11: Hillcrest Avenue & E. 18th Street

Existing+Project PM Conditions

07/12/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	296	175	233	218	22	190	178	329	33	112	34
Future Volume (vph)	37	296	175	233	218	22	190	178	329	33	112	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3310		1752	3457		1665	1744	1568	1752	1845	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	3310		1752	3457		1665	1744	1568	1752	1845	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	322	190	253	237	24	207	193	358	36	122	37
RTOR Reduction (vph)	0	75	0	0	7	0	0	0	258	0	0	32
Lane Group Flow (vph)	40	437	0	253	254	0	186	214	100	36	122	5
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			6
Actuated Green, G (s)	6.0	24.0		27.0	45.0		32.0	32.0	32.0	16.0	16.0	16.0
Effective Green, g (s)	6.0	24.0		27.0	45.0		32.0	32.0	32.0	16.0	16.0	16.0
Actuated g/C Ratio	0.05	0.21		0.23	0.39		0.28	0.28	0.28	0.14	0.14	0.14
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	91	690		411	1352		463	485	436	243	256	218
v/s Ratio Prot	0.02	c0.13		c0.14	0.07		0.11	c0.12		0.02	c0.07	
v/s Ratio Perm									0.06			0.00
v/c Ratio	0.44	0.63		0.62	0.19		0.40	0.44	0.23	0.15	0.48	0.02
Uniform Delay, d1	52.9	41.5		39.4	23.0		33.7	34.1	32.0	43.5	45.6	42.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.7	4.4		6.7	0.3		2.6	2.9	1.2	1.3	6.2	0.2
Delay (s)	67.5	45.9		46.1	23.3		36.3	37.0	33.2	44.8	51.9	43.0
Level of Service	E	D		D	C		D	D	C	D	D	D
Approach Delay (s)		47.4			34.5			35.0			48.9	
Approach LOS		D			C			D			D	





















Intersection Summary

HCM 2000 Control Delay	39.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group
























HCM 2010 Signalized Intersection Summary  
 1: A Street & W. 9th Street/Wilbur Avenue

Cumulative AM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	19	13	180	51	205	8	139	186	77	90	5
Future Volume (veh/h)	3	19	13	180	51	205	8	139	186	77	90	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1900	1900	1845	1845	1900	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	3	21	14	200	57	228	9	154	207	86	100	0
Adj No. of Lanes	0	1	0	0	1	1	0	1	1	1	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	32	225	150	326	93	370	61	399	348	146	666	566
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.22	0.22	0.22	0.08	0.36	0.00
Sat Flow, veh/h	136	954	636	1382	394	1568	35	1794	1568	1757	1845	1568
Grp Volume(v), veh/h	38	0	0	257	0	228	163	0	207	86	100	0
Grp Sat Flow(s),veh/h/ln	1726	0	0	1776	0	1568	1829	0	1568	1757	1845	1568
Q Serve(g_s), s	1.2	0.0	0.0	9.3	0.0	9.4	0.0	0.0	8.5	3.4	2.6	0.0
Cycle Q Clear(g_c), s	1.2	0.0	0.0	9.3	0.0	9.4	5.4	0.0	8.5	3.4	2.6	0.0
Prop In Lane	0.08		0.37	0.78		1.00	0.06		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	407	0	0	419	0	370	459	0	348	146	666	566
V/C Ratio(X)	0.09	0.00	0.00	0.61	0.00	0.62	0.35	0.00	0.59	0.59	0.15	0.00
Avail Cap(c_a), veh/h	407	0	0	419	0	370	459	0	348	146	666	566
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.5	0.0	0.0	24.6	0.0	24.6	23.9	0.0	25.1	31.8	15.5	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	6.6	0.0	7.5	2.1	0.0	7.3	16.1	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	5.3	0.0	4.8	3.0	0.0	4.4	2.3	1.4	0.0
LnGrp Delay(d),s/veh	21.9	0.0	0.0	31.1	0.0	32.1	26.0	0.0	32.4	47.9	16.0	0.0
LnGrp LOS	C			C		C	C		C	D	B	
Approach Vol, veh/h		38			485			370			186	
Approach Delay, s/veh		21.9			31.6			29.6			30.8	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.0	20.0		21.0		30.0		21.0				
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	6.0	16.0		17.0		26.0		17.0				
Max Q Clear Time (g_c+I1), s	5.4	10.5		3.2		4.6		11.4				
Green Ext Time (p_c), s	0.0	1.1		0.1		2.2		1.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				30.4								
HCM 2010 LOS				C								




















HCM 2010 Signalized Intersection Summary  
 2: Cavallo Road/Fulton Shipyard Road & Wilbur Avenue

Cumulative AM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	217	54	35	304	17	104	10	74	7	7	19
Future Volume (veh/h)	10	217	54	35	304	17	104	10	74	7	7	19
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1845	1845	1845	1845	1845	1845	1900
Adj Flow Rate, veh/h	11	241	60	39	338	19	116	11	82	8	8	21
Adj No. of Lanes	1	2	0	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	107	1142	279	183	834	709	382	529	450	107	59	154
Arrive On Green	0.06	0.41	0.41	0.10	0.45	0.45	0.22	0.29	0.29	0.06	0.13	0.13
Sat Flow, veh/h	1757	2795	682	1757	1845	1568	1757	1845	1568	1757	451	1184
Grp Volume(v), veh/h	11	149	152	39	338	19	116	11	82	8	0	29
Grp Sat Flow(s),veh/h/ln	1757	1752	1724	1757	1845	1568	1757	1845	1568	1757	0	1636
Q Serve(g_s), s	0.7	6.3	6.6	2.3	14.1	0.8	6.4	0.5	4.5	0.5	0.0	1.8
Cycle Q Clear(g_c), s	0.7	6.3	6.6	2.3	14.1	0.8	6.4	0.5	4.5	0.5	0.0	1.8
Prop In Lane	1.00		0.40	1.00		1.00	1.00		1.00	1.00		0.72
Lane Grp Cap(c), veh/h	107	716	705	183	834	709	382	529	450	107	0	213
V/C Ratio(X)	0.10	0.21	0.22	0.21	0.41	0.03	0.30	0.02	0.18	0.07	0.00	0.14
Avail Cap(c_a), veh/h	107	716	705	183	834	709	382	529	450	107	0	213
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.0	22.0	22.0	47.2	21.1	17.5	37.7	29.4	30.8	50.9	0.0	44.3
Incr Delay (d2), s/veh	1.9	0.7	0.7	2.6	1.5	0.1	2.0	0.1	0.9	1.4	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.2	3.3	1.3	7.5	0.3	3.3	0.3	2.1	0.3	0.0	0.9
LnGrp Delay(d),s/veh	53.0	22.6	22.7	49.8	22.6	17.5	39.7	29.5	31.7	52.3	0.0	45.6
LnGrp LOS	D	C	C	D	C	B	D	C	C	D		D
Approach Vol, veh/h		312			396			209				37
Approach Delay, s/veh		23.8			25.0			36.1				47.0
Approach LOS		C			C			D				D
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	37.0	16.0	51.0	29.0	19.0	11.0	56.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	7.0	33.0	12.0	47.0	25.0	15.0	7.0	52.0				
Max Q Clear Time (g_c+I1), s	2.5	6.5	4.3	8.6	8.4	3.8	2.7	16.1				
Green Ext Time (p_c), s	0.0	0.4	0.0	4.4	0.2	0.3	0.0	4.4				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			27.9									
HCM 2010 LOS			C									




















HCM 2010 Signalized Intersection Summary  
3: G Street & W. 10th Street

Cumulative AM Conditions  
07/13/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	266	61	48	469	27	48	133	35	70	175	19
Future Volume (veh/h)	11	266	61	48	469	27	48	133	35	70	175	19
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1900
Adj Flow Rate, veh/h	12	280	64	51	494	28	51	140	37	74	184	20
Adj No. of Lanes	0	1	1	0	1	1	0	1	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	75	989	862	119	918	862	177	436	497	174	388	38
Arrive On Green	0.55	0.55	0.55	0.55	0.55	0.55	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	22	1798	1568	97	1670	1568	317	1376	1568	309	1225	119
Grp Volume(v), veh/h	292	0	64	545	0	28	191	0	37	278	0	0
Grp Sat Flow(s),veh/h/ln	1820	0	1568	1767	0	1568	1694	0	1568	1654	0	0
Q Serve(g_s), s	0.0	0.0	1.1	0.0	0.0	0.5	0.0	0.0	1.0	2.7	0.0	0.0
Cycle Q Clear(g_c), s	5.1	0.0	1.1	11.3	0.0	0.5	4.7	0.0	1.0	7.8	0.0	0.0
Prop In Lane	0.04		1.00	0.09		1.00	0.27		1.00	0.27		0.07
Lane Grp Cap(c), veh/h	1063	0	862	1037	0	862	612	0	497	600	0	0
V/C Ratio(X)	0.27	0.00	0.07	0.53	0.00	0.03	0.31	0.00	0.07	0.46	0.00	0.00
Avail Cap(c_a), veh/h	1063	0	862	1037	0	862	612	0	497	600	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.2	0.0	6.3	8.6	0.0	6.2	15.6	0.0	14.3	16.6	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.0	0.2	1.9	0.0	0.1	1.3	0.0	0.3	2.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	0.5	6.2	0.0	0.2	2.6	0.0	0.5	4.1	0.0	0.0
LnGrp Delay(d),s/veh	7.9	0.0	6.5	10.5	0.0	6.3	17.0	0.0	14.6	19.1	0.0	0.0
LnGrp LOS	A		A	B		A	B		B	B		
Approach Vol, veh/h		356			573			228			278	
Approach Delay, s/veh		7.6			10.3			16.6			19.1	
Approach LOS		A			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.0		37.0		23.0		37.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		19.0		33.0		19.0		33.0				
Max Q Clear Time (g_c+I1), s		6.7		7.1		9.8		13.3				
Green Ext Time (p_c), s		2.4		6.4		2.1		5.9				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			12.4									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary  
4: A Street & W. 10th Street/Beede Way

Cumulative AM Conditions  
07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	132	13	233	13	17	8	229	219	10	3	214	204
Future Volume (veh/h)	132	13	233	13	17	8	229	219	10	3	214	204
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1900	1845	1900	1845	1845	1900	1900	1845	1900
Adj Flow Rate, veh/h	143	14	0	14	18	9	249	238	11	3	233	222
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	410	430	0	46	60	30	527	1896	87	42	388	301
Arrive On Green	0.23	0.23	0.00	0.08	0.08	0.08	0.30	0.56	0.56	0.21	0.21	0.21
Sat Flow, veh/h	1757	1845	0	597	767	384	1757	3412	157	5	1836	1427
Grp Volume(v), veh/h	143	14	0	41	0	0	249	122	127	236	0	222
Grp Sat Flow(s),veh/h/ln	1757	1845	0	1747	0	0	1757	1752	1817	1841	0	1427
Q Serve(g_s), s	6.1	0.5	0.0	2.0	0.0	0.0	10.4	3.0	3.0	0.0	0.0	13.1
Cycle Q Clear(g_c), s	6.1	0.5	0.0	2.0	0.0	0.0	10.4	3.0	3.0	10.4	0.0	13.1
Prop In Lane	1.00		0.00	0.34		0.22	1.00		0.09	0.01		1.00
Lane Grp Cap(c), veh/h	410	430	0	136	0	0	527	974	1009	429	0	301
V/C Ratio(X)	0.35	0.03	0.00	0.30	0.00	0.00	0.47	0.13	0.13	0.55	0.00	0.74
Avail Cap(c_a), veh/h	410	430	0	136	0	0	527	974	1009	429	0	301
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.8	26.7	0.0	39.2	0.0	0.0	25.7	9.6	9.6	32.1	0.0	33.2
Incr Delay (d2), s/veh	2.3	0.1	0.0	5.6	0.0	0.0	3.0	0.3	0.3	5.0	0.0	14.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.3	0.0	1.2	0.0	0.0	5.5	1.5	1.6	5.9	0.0	6.4
LnGrp Delay(d),s/veh	31.1	26.8	0.0	44.8	0.0	0.0	28.7	9.8	9.8	37.1	0.0	48.0
LnGrp LOS	C	C		D			C	A	A	D		D
Approach Vol, veh/h		157			41			498			458	
Approach Delay, s/veh		30.7			44.8			19.3			42.4	
Approach LOS		C			D			B			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		54.0		25.0	31.0	23.0		11.0				
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s		50.0		21.0	27.0	19.0		7.0				
Max Q Clear Time (g_c+I1), s		5.0		8.1	12.4	15.1		4.0				
Green Ext Time (p_c), s		5.0		0.3	0.6	1.6		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				30.9								
HCM 2010 LOS				C								

**Intersection**

Int Delay, s/veh 2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	43	41	0	66	14	434	75	54	393	1
Future Vol, veh/h	0	0	43	41	0	66	14	434	75	54	393	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	47	45	0	72	15	472	82	59	427	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	811	1129	214	874	1089	277	428	0	0	553	0	0
Stage 1	545	545	-	543	543	-	-	-	-	-	-	-
Stage 2	266	584	-	331	546	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	269	201	788	242	212	717	1121	-	-	1006	-	-
Stage 1	488	514	-	489	515	-	-	-	-	-	-	-
Stage 2	714	494	-	653	514	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	224	182	788	211	192	717	1121	-	-	1006	-	-
Mov Cap-2 Maneuver	224	182	-	211	192	-	-	-	-	-	-	-
Stage 1	478	474	-	479	505	-	-	-	-	-	-	-
Stage 2	630	484	-	567	474	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.9	18.9	0.2	1.3
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1121	-	-	788	374	1006	-	-
HCM Lane V/C Ratio	0.014	-	-	0.059	0.311	0.058	-	-
HCM Control Delay (s)	8.3	-	-	9.9	18.9	8.8	0.3	-
HCM Lane LOS	A	-	-	A	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	1.3	0.2	-	-

**Intersection**

Int Delay, s/veh 3.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	26	98	35	183	143	26
Future Vol, veh/h	26	98	35	183	143	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	175	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	29	109	39	203	159	29























Major/Minor	Minor2	Major1		Major2
Conflicting Flow All	454	173	188	0
Stage 1	173	-	-	-
Stage 2	281	-	-	-
Critical Hdwy	7.13	6.23	4.13	-
Critical Hdwy Stg 1	6.13	-	-	-
Critical Hdwy Stg 2	6.13	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-
Pot Cap-1 Maneuver	515	868	1380	-
Stage 1	827	-	-	-
Stage 2	724	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	504	868	1380	-
Mov Cap-2 Maneuver	504	-	-	-
Stage 1	804	-	-	-
Stage 2	704	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	1.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1380	-	754	-	-
HCM Lane V/C Ratio	0.028	-	0.183	-	-
HCM Control Delay (s)	7.7	-	10.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

HCM 2010 Signalized Intersection Summary  
7: G Street & W. 18th Street
























Cumulative AM Conditions  
07/13/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	134	151	55	258	51	196	123	58	94	116	137
Future Volume (veh/h)	47	134	151	55	258	51	196	123	58	94	116	137
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1845	1845	1845	1900	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	51	146	0	60	280	0	213	134	13	102	126	149
Adj No. of Lanes	1	1	1	1	1	1	0	1	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	71	396	337	79	405	344	267	168	381	146	181	284
Arrive On Green	0.04	0.21	0.00	0.05	0.22	0.00	0.24	0.24	0.24	0.18	0.18	0.18
Sat Flow, veh/h	1757	1845	1568	1757	1845	1568	1099	691	1568	807	997	1568
Grp Volume(v), veh/h	51	146	0	60	280	0	347	0	13	228	0	149
Grp Sat Flow(s),veh/h/ln	1757	1845	1568	1757	1845	1568	1790	0	1568	1804	0	1568
Q Serve(g_s), s	1.5	3.4	0.0	1.7	7.1	0.0	9.2	0.0	0.3	6.0	0.0	4.4
Cycle Q Clear(g_c), s	1.5	3.4	0.0	1.7	7.1	0.0	9.2	0.0	0.3	6.0	0.0	4.4
Prop In Lane	1.00		1.00	1.00		1.00	0.61		1.00	0.45		1.00
Lane Grp Cap(c), veh/h	71	396	337	79	405	344	435	0	381	327	0	284
V/C Ratio(X)	0.72	0.37	0.00	0.76	0.69	0.00	0.80	0.00	0.03	0.70	0.00	0.52
Avail Cap(c_a), veh/h	173	765	650	173	765	650	601	0	526	570	0	495
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.0	17.0	0.0	23.9	18.2	0.0	18.0	0.0	14.6	19.4	0.0	18.8
Incr Delay (d2), s/veh	12.7	0.6	0.0	13.7	2.1	0.0	5.2	0.0	0.0	2.7	0.0	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	1.8	0.0	1.1	3.8	0.0	5.2	0.0	0.1	3.2	0.0	2.0
LnGrp Delay(d),s/veh	36.7	17.5	0.0	37.6	20.3	0.0	23.2	0.0	14.7	22.1	0.0	20.3
LnGrp LOS	D	B		D	C		C		B	C		C
Approach Vol, veh/h		197			340			360			377	
Approach Delay, s/veh		22.5			23.4			22.9			21.4	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		16.3	6.3	14.9		13.2	6.0	15.1				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	5.0	21.0		16.0	5.0	21.0				
Max Q Clear Time (g_c+I1), s		11.2	3.7	5.4		8.0	3.5	9.1				
Green Ext Time (p_c), s		1.1	0.0	2.3		1.2	0.0	2.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			22.5									
HCM 2010 LOS			C									



HCM Signalized Intersection Capacity Analysis  
 8: A Street & W. 18th Street/E. 18th Street

Cumulative AM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	142	58	246	161	203	72	545	180	113	566	22
Future Volume (vph)	64	142	58	246	161	203	72	545	180	113	566	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1764		1665	1733	1568	1752	3505	1568	1752	3485	
Flt Permitted	0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1764		1665	1733	1568	1752	3505	1568	1752	3485	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	70	154	63	267	175	221	78	592	196	123	615	24
RTOR Reduction (vph)	0	13	0	0	0	169	0	0	137	0	2	0
Lane Group Flow (vph)	70	204	0	216	226	52	78	592	59	123	637	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	25.0	25.0		28.0	28.0	28.0	12.0	36.0	36.0	15.0	39.0	
Effective Green, g (s)	25.0	25.0		28.0	28.0	28.0	12.0	36.0	36.0	15.0	39.0	
Actuated g/C Ratio	0.21	0.21		0.23	0.23	0.23	0.10	0.30	0.30	0.12	0.32	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	365	367		388	404	365	175	1051	470	219	1132	
v/s Ratio Prot	0.04	c0.12		0.13	c0.13		0.04	0.17		c0.07	c0.18	
v/s Ratio Perm						0.03			0.04			
v/c Ratio	0.19	0.56		0.56	0.56	0.14	0.45	0.56	0.13	0.56	0.56	
Uniform Delay, d1	39.2	42.5		40.5	40.6	36.5	50.9	35.4	30.5	49.4	33.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	6.0		5.7	5.5	0.8	8.0	2.2	0.5	10.0	2.0	
Delay (s)	40.3	48.5		46.2	46.1	37.3	58.9	37.6	31.1	59.4	35.5	
Level of Service	D	D		D	D	D	E	D	C	E	D	
Approach Delay (s)		46.5			43.2			38.0			39.3	
Approach LOS		D			D			D			D	

Intersection Summary

HCM 2000 Control Delay	40.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 9: Service Road & Evergreen Avenue/Driveway & E. 18th Street

Cumulative AM Conditions  
 07/12/2017



Movement	EBL	EBT	EBR	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Traffic Volume (vph)	21	372	1	26	579	2	10	1	64	7	4	23
Future Volume (vph)	21	372	1	26	579	2	10	1	64	7	4	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.88			0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1752	3504		1752	3503			1621			1658	
Flt Permitted	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (perm)	1752	3504		1752	3503			1621			1658	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	404	1	28	629	2	11	1	70	8	4	25
RTOR Reduction (vph)	0	0	0	0	0	0	0	62	0	0	34	0
Lane Group Flow (vph)	23	405	0	28	631	0	0	20	0	0	3	0
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	7	4		3	8		5	5		6	6	
Permitted Phases												
Actuated Green, G (s)	10.0	39.0		11.0	40.0			12.0			7.0	
Effective Green, g (s)	10.0	39.0		11.0	40.0			12.0			7.0	
Actuated g/C Ratio	0.10	0.39		0.11	0.40			0.12			0.07	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	175	1366		192	1401			194			116	
v/s Ratio Prot	0.01	0.12		c0.02	c0.18			c0.01			c0.00	
v/s Ratio Perm												
v/c Ratio	0.13	0.30		0.15	0.45			0.11			0.02	
Uniform Delay, d1	41.0	21.0		40.3	22.0			39.2			43.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.6	0.6		1.6	1.0			1.1			0.4	
Delay (s)	42.6	21.6		41.8	23.0			40.3			43.7	
Level of Service	D	C		D	C			D			D	
Approach Delay (s)		22.7			23.8			40.3			43.7	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		





















c Critical Lane Group



Movement	NEL2	NEL
Lane Configurations		
Traffic Volume (vph)	4	0
Future Volume (vph)	4	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		4.0
Lane Util. Factor		1.00
Frt		1.00
Flt Protected		0.95
Satd. Flow (prot)		1752
Flt Permitted		0.95
Satd. Flow (perm)		1752
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	4	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	4
Turn Type	Prot	Prot
Protected Phases	2	2
Permitted Phases		
Actuated Green, G (s)		11.0
Effective Green, g (s)		11.0
Actuated g/C Ratio		0.11
Clearance Time (s)		4.0
Vehicle Extension (s)		3.0
Lane Grp Cap (vph)		192
v/s Ratio Prot		c0.00
v/s Ratio Perm		
v/c Ratio		0.02
Uniform Delay, d1		39.7
Progression Factor		1.00
Incremental Delay, d2		0.2
Delay (s)		39.9
Level of Service		D
Approach Delay (s)		39.9
Approach LOS		D
<b>Intersection Summary</b>		























HCM 2010 Signalized Intersection Summary  
 10: Cavallo Road & E. 18th Street

Cumulative AM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	247	62	42	438	82	77	107	35	69	99	77
Future Volume (veh/h)	96	247	62	42	438	82	77	107	35	69	99	77
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	104	268	67	46	476	89	84	116	38	75	108	84
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	351	1151	283	220	996	185	355	416	136	390	301	234
Arrive On Green	0.20	0.41	0.41	0.13	0.34	0.34	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1757	2791	685	1757	2951	549	1175	1332	436	1216	963	749
Grp Volume(v), veh/h	104	166	169	46	282	283	84	0	154	75	0	192
Grp Sat Flow(s),veh/h/ln	1757	1752	1724	1757	1752	1748	1175	0	1768	1216	0	1712
Q Serve(g_s), s	4.0	4.9	5.1	1.9	10.1	10.3	4.8	0.0	5.2	4.0	0.0	6.9
Cycle Q Clear(g_c), s	4.0	4.9	5.1	1.9	10.1	10.3	11.7	0.0	5.2	9.2	0.0	6.9
Prop In Lane	1.00		0.40	1.00		0.31	1.00		0.25	1.00		0.44
Lane Grp Cap(c), veh/h	351	723	711	220	591	590	355	0	552	390	0	535
V/C Ratio(X)	0.30	0.23	0.24	0.21	0.48	0.48	0.24	0.00	0.28	0.19	0.00	0.36
Avail Cap(c_a), veh/h	351	723	711	220	591	590	355	0	552	390	0	535
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.2	15.3	15.3	31.4	20.9	21.0	25.8	0.0	20.7	24.2	0.0	21.3
Incr Delay (d2), s/veh	2.1	0.7	0.8	2.2	2.7	2.8	1.6	0.0	1.3	1.1	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	2.5	2.5	1.0	5.3	5.4	1.7	0.0	2.8	1.5	0.0	3.5
LnGrp Delay(d),s/veh	29.4	16.0	16.1	33.6	23.7	23.7	27.4	0.0	22.0	25.3	0.0	23.2
LnGrp LOS	C	B	B	C	C	C	C		C	C		C
Approach Vol, veh/h		439			611			238			267	
Approach Delay, s/veh		19.2			24.4			23.9			23.8	
Approach LOS		B			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		29.0	14.0	37.0		29.0	20.0	31.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		25.0	10.0	33.0		25.0	16.0	27.0				
Max Q Clear Time (g_c+I1), s		13.7	3.9	7.1		11.2	6.0	12.3				
Green Ext Time (p_c), s		2.1	0.0	6.0		2.3	0.2	4.9				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				22.8								
HCM 2010 LOS				C								

HCM Signalized Intersection Capacity Analysis  
 11: Hillcrest Avenue & E. 18th Street





















Cumulative AM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	169	169	288	294	18	276	109	319	26	123	28
Future Volume (vph)	24	169	169	288	294	18	276	109	319	26	123	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3242		1752	3474		1665	1715	1568	1752	1845	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	3242		1752	3474		1665	1715	1568	1752	1845	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	184	184	313	320	20	300	118	347	28	134	30
RTOR Reduction (vph)	0	159	0	0	4	0	0	0	254	0	0	25
Lane Group Flow (vph)	26	209	0	313	336	0	207	211	93	28	134	5
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			6
Actuated Green, G (s)	5.0	14.0		31.0	40.0		28.0	28.0	28.0	16.0	16.0	16.0
Effective Green, g (s)	5.0	14.0		31.0	40.0		28.0	28.0	28.0	16.0	16.0	16.0
Actuated g/C Ratio	0.05	0.13		0.30	0.38		0.27	0.27	0.27	0.15	0.15	0.15
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	83	432		517	1323		444	457	418	266	281	238
v/s Ratio Prot	0.01	c0.06		c0.18	0.10		c0.12	0.12		0.02	c0.07	
v/s Ratio Perm									0.06			0.00
v/c Ratio	0.31	0.48		0.61	0.25		0.47	0.46	0.22	0.11	0.48	0.02
Uniform Delay, d1	48.3	42.1		31.8	22.3		32.2	32.2	30.0	38.3	40.7	37.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.6	3.8		5.2	0.5		3.5	3.3	1.2	0.8	5.7	0.1
Delay (s)	57.9	46.0		36.9	22.7		35.7	35.5	31.2	39.1	46.4	38.0
Level of Service	E	D		D	C		D	D	C	D	D	D
Approach Delay (s)		46.8			29.5			33.6			44.0	
Approach LOS		D			C			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			35.9			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			105.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			56.4%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group
























HCM 2010 Signalized Intersection Summary  
 1: A Street & W. 9th Street/Wilbur Avenue

Cumulative PM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	38	18	103	27	113	11	187	329	225	156	3
Future Volume (veh/h)	2	38	18	103	27	113	11	187	329	225	156	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1900	1900	1845	1845	1900	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	2	41	20	112	29	123	12	203	358	245	170	0
Adj No. of Lanes	0	1	0	0	1	1	0	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	10	203	99	252	65	281	51	488	429	351	951	809
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.27	0.27	0.27	0.20	0.52	0.00
Sat Flow, veh/h	55	1135	554	1409	365	1568	40	1783	1568	1757	1845	1568
Grp Volume(v), veh/h	63	0	0	141	0	123	215	0	358	245	170	0
Grp Sat Flow(s),veh/h/ln	1744	0	0	1774	0	1568	1823	0	1568	1757	1845	1568
Q Serve(g_s), s	2.9	0.0	0.0	6.7	0.0	6.6	0.0	0.0	20.4	12.3	4.7	0.0
Cycle Q Clear(g_c), s	2.9	0.0	0.0	6.7	0.0	6.6	9.1	0.0	20.4	12.3	4.7	0.0
Prop In Lane	0.03		0.32	0.79		1.00	0.06		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	312	0	0	317	0	281	539	0	429	351	951	809
V/C Ratio(X)	0.20	0.00	0.00	0.44	0.00	0.44	0.40	0.00	0.83	0.70	0.18	0.00
Avail Cap(c_a), veh/h	312	0	0	317	0	281	539	0	429	351	951	809
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.2	0.0	0.0	34.8	0.0	34.7	28.4	0.0	32.5	35.3	12.3	0.0
Incr Delay (d2), s/veh	1.5	0.0	0.0	4.5	0.0	4.9	2.2	0.0	17.2	10.9	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	3.7	0.0	3.3	4.9	0.0	10.9	7.1	2.5	0.0
LnGrp Delay(d),s/veh	34.7	0.0	0.0	39.2	0.0	39.7	30.6	0.0	49.6	46.3	12.7	0.0
LnGrp LOS	C			D		D	C		D	D	B	
Approach Vol, veh/h		63			264			573			415	
Approach Delay, s/veh		34.7			39.4			42.5			32.5	
Approach LOS		C			D			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	23.0	30.0		21.0		53.0		21.0				
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	19.0	26.0		17.0		49.0		17.0				
Max Q Clear Time (g_c+I1), s	14.3	22.4		4.9		6.7		8.7				
Green Ext Time (p_c), s	0.3	1.3		0.2		3.9		0.7				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				38.3								
HCM 2010 LOS				D								




















HCM 2010 Signalized Intersection Summary  
 2: Cavallo Road/Fulton Shipyard Road & Wilbur Avenue

Cumulative PM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	379	78	58	150	15	62	26	98	18	16	17
Future Volume (veh/h)	23	379	78	58	150	15	62	26	98	18	16	17
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1845	1845	1845	1845	1845	1845	1900
Adj Flow Rate, veh/h	26	421	87	64	167	17	69	29	109	20	18	19
Adj No. of Lanes	1	2	0	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	141	927	190	234	689	585	164	492	418	117	197	208
Arrive On Green	0.08	0.32	0.32	0.13	0.37	0.37	0.09	0.27	0.27	0.07	0.24	0.24
Sat Flow, veh/h	1757	2898	594	1757	1845	1568	1757	1845	1568	1757	823	869
Grp Volume(v), veh/h	26	253	255	64	167	17	69	29	109	20	0	37
Grp Sat Flow(s),veh/h/ln	1757	1752	1740	1757	1845	1568	1757	1845	1568	1757	0	1691
Q Serve(g_s), s	1.0	8.6	8.7	2.5	4.7	0.5	2.8	0.9	4.1	0.8	0.0	1.3
Cycle Q Clear(g_c), s	1.0	8.6	8.7	2.5	4.7	0.5	2.8	0.9	4.1	0.8	0.0	1.3
Prop In Lane	1.00		0.34	1.00		1.00	1.00		1.00	1.00		0.51
Lane Grp Cap(c), veh/h	141	561	557	234	689	585	164	492	418	117	0	406
V/C Ratio(X)	0.18	0.45	0.46	0.27	0.24	0.03	0.42	0.06	0.26	0.17	0.00	0.09
Avail Cap(c_a), veh/h	141	561	557	234	689	585	164	492	418	117	0	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.2	20.3	20.3	29.2	16.2	14.9	32.1	20.5	21.7	33.0	0.0	22.1
Incr Delay (d2), s/veh	2.9	2.6	2.7	2.9	0.8	0.1	7.7	0.2	1.5	3.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	4.6	4.6	1.4	2.5	0.2	1.7	0.5	2.0	0.5	0.0	0.6
LnGrp Delay(d),s/veh	35.1	22.9	23.0	32.1	17.0	15.0	39.8	20.7	23.2	36.2	0.0	22.6
LnGrp LOS	D	C	C	C	B	B	D	C	C	D		C
Approach Vol, veh/h		534			248			207				57
Approach Delay, s/veh		23.5			20.8			28.4				27.4
Approach LOS		C			C			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.0	24.0	14.0	28.0	11.0	22.0	10.0	32.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	5.0	20.0	10.0	24.0	7.0	18.0	6.0	28.0				
Max Q Clear Time (g_c+I1), s	2.8	6.1	4.5	10.7	4.8	3.3	3.0	6.7				
Green Ext Time (p_c), s	0.0	0.5	0.0	3.5	0.0	0.5	0.0	4.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			24.1									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary  
3: G Street & W. 10th Street




















Cumulative PM Conditions  
07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	479	27	16	278	29	17	59	24	88	97	46
Future Volume (veh/h)	32	479	27	16	278	29	17	59	24	88	97	46
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1900
Adj Flow Rate, veh/h	35	521	29	17	302	32	18	64	26	96	105	50
Adj No. of Lanes	0	1	1	0	1	1	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	112	895	801	100	908	801	163	474	488	253	254	99
Arrive On Green	0.51	0.51	0.51	0.51	0.51	0.51	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	52	1751	1568	31	1776	1568	211	1524	1568	457	818	317
Grp Volume(v), veh/h	556	0	29	319	0	32	82	0	26	251	0	0
Grp Sat Flow(s),veh/h/ln	1803	0	1568	1808	0	1568	1735	0	1568	1592	0	0
Q Serve(g_s), s	0.0	0.0	0.4	0.0	0.0	0.5	0.0	0.0	0.5	2.3	0.0	0.0
Cycle Q Clear(g_c), s	9.5	0.0	0.4	4.6	0.0	0.5	1.4	0.0	0.5	5.5	0.0	0.0
Prop In Lane	0.06		1.00	0.05		1.00	0.22		1.00	0.38		0.20
Lane Grp Cap(c), veh/h	1007	0	801	1008	0	801	637	0	488	606	0	0
V/C Ratio(X)	0.55	0.00	0.04	0.32	0.00	0.04	0.13	0.00	0.05	0.41	0.00	0.00
Avail Cap(c_a), veh/h	1007	0	801	1008	0	801	637	0	488	606	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.7	0.0	5.5	6.5	0.0	5.5	11.2	0.0	10.9	12.5	0.0	0.0
Incr Delay (d2), s/veh	2.2	0.0	0.1	0.8	0.0	0.1	0.4	0.0	0.2	2.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	0.0	0.2	2.5	0.0	0.2	0.8	0.0	0.3	2.9	0.0	0.0
LnGrp Delay(d),s/veh	9.9	0.0	5.6	7.3	0.0	5.6	11.6	0.0	11.1	14.6	0.0	0.0
LnGrp LOS	A		A	A		A	B		B	B		
Approach Vol, veh/h		585			351			108			251	
Approach Delay, s/veh		9.7			7.2			11.5			14.6	
Approach LOS		A			A			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		18.0		27.0		18.0		27.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		14.0		23.0		14.0		23.0				
Max Q Clear Time (g_c+I1), s		3.4		11.5		7.5		6.6				
Green Ext Time (p_c), s		1.5		4.6		1.1		5.6				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			10.1									
HCM 2010 LOS			B									



HCM 2010 Signalized Intersection Summary  
4: A Street & W. 10th Street/Beede Way

Cumulative PM Conditions  
07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	4	264	17	5	7	166	239	19	1	272	68
Future Volume (veh/h)	195	4	264	17	5	7	166	239	19	1	272	68
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1900	1845	1900	1845	1845	1900	1900	1845	1900
Adj Flow Rate, veh/h	212	4	0	18	5	8	180	260	21	1	296	74
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	509	535	0	80	22	35	422	1676	134	37	629	154
Arrive On Green	0.29	0.29	0.00	0.08	0.08	0.08	0.24	0.51	0.51	0.23	0.23	0.23
Sat Flow, veh/h	1757	1845	0	997	277	443	1757	3287	264	1	2733	669
Grp Volume(v), veh/h	212	4	0	31	0	0	180	138	143	198	0	173
Grp Sat Flow(s),veh/h/ln	1757	1845	0	1717	0	0	1757	1752	1798	1844	0	1561
Q Serve(g_s), s	9.7	0.2	0.0	1.7	0.0	0.0	8.7	4.2	4.2	0.0	0.0	9.6
Cycle Q Clear(g_c), s	9.7	0.2	0.0	1.7	0.0	0.0	8.7	4.2	4.2	9.3	0.0	9.6
Prop In Lane	1.00		0.00	0.58		0.26	1.00		0.15	0.01		0.43
Lane Grp Cap(c), veh/h	509	535	0	137	0	0	422	894	917	460	0	359
V/C Ratio(X)	0.42	0.01	0.00	0.23	0.00	0.00	0.43	0.15	0.16	0.43	0.00	0.48
Avail Cap(c_a), veh/h	509	535	0	137	0	0	422	894	917	460	0	359
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.7	25.3	0.0	43.1	0.0	0.0	32.2	13.0	13.0	33.2	0.0	33.3
Incr Delay (d2), s/veh	2.5	0.0	0.0	3.8	0.0	0.0	3.1	0.4	0.4	2.9	0.0	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	0.1	0.0	0.9	0.0	0.0	4.6	2.1	2.2	5.1	0.0	4.6
LnGrp Delay(d),s/veh	31.2	25.3	0.0	46.9	0.0	0.0	35.3	13.4	13.4	36.2	0.0	37.9
LnGrp LOS	C	C		D			D	B	B	D		D
Approach Vol, veh/h		216			31			461			371	
Approach Delay, s/veh		31.0			46.9			22.0			37.0	
Approach LOS		C			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		55.0		33.0	28.0	27.0		12.0				
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s		51.0		29.0	24.0	23.0		8.0				
Max Q Clear Time (g_c+I1), s		6.2		11.7	10.7	11.6		3.7				
Green Ext Time (p_c), s		4.4		0.6	0.4	3.0		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				29.7								
HCM 2010 LOS				C								

**Intersection**

Int Delay, s/veh 0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	11	19	0	18	2	467	32	22	522	0
Future Vol, veh/h	0	0	11	19	0	18	2	467	32	22	522	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	12	21	0	20	2	508	35	24	567	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	873	1162	284	861	1144	271	567	0	0	542	0	0
Stage 1	615	615	-	529	529	-	-	-	-	-	-	-
Stage 2	258	547	-	332	615	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	243	192	710	248	197	724	994	-	-	1016	-	0
Stage 1	443	478	-	499	523	-	-	-	-	-	-	0
Stage 2	721	513	-	652	478	-	-	-	-	-	-	0
Platoon blocked, %												
Mov Cap-1 Maneuver	230	185	710	237	190	724	994	-	-	1016	-	-
Mov Cap-2 Maneuver	230	185	-	237	190	-	-	-	-	-	-	-
Stage 1	442	462	-	498	521	-	-	-	-	-	-	-
Stage 2	699	511	-	619	462	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.2	16.5	0	0.4
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT
Capacity (veh/h)	994	-	-	710	352	1016	-
HCM Lane V/C Ratio	0.002	-	-	0.017	0.114	0.024	-
HCM Control Delay (s)	8.6	-	-	10.2	16.5	8.6	0.1
HCM Lane LOS	A	-	-	B	C	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	0.4	0.1	-

**Intersection**

Int Delay, s/veh 1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	33	30	186	182	10
Future Vol, veh/h	11	33	30	186	182	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	175	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	12	37	33	207	202	11





















Major/Minor	Minor2	Major1		Major2
Conflicting Flow All	481	208	213	0
Stage 1	208	-	-	-
Stage 2	273	-	-	-
Critical Hdwy	6.43	6.23	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-
Pot Cap-1 Maneuver	542	830	1351	-
Stage 1	824	-	-	-
Stage 2	771	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	529	830	1351	-
Mov Cap-2 Maneuver	529	-	-	-
Stage 1	824	-	-	-
Stage 2	752	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.3	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1351	-	727	-	-
HCM Lane V/C Ratio	0.025	-	0.067	-	-
HCM Control Delay (s)	7.7	-	10.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-
























HCM 2010 Signalized Intersection Summary  
7: G Street & W. 18th Street

Cumulative PM Conditions  
07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	373	37	87	355	72	17	98	74	87	203	107
Future Volume (veh/h)	51	373	37	87	355	72	17	98	74	87	203	107
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1900	1900	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	55	405	0	95	386	0	18	107	80	95	221	116
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	146	584	0	176	615	0	44	261	261	82	191	235
Arrive On Green	0.08	0.32	0.00	0.10	0.33	0.00	0.17	0.17	0.17	0.15	0.15	0.15
Sat Flow, veh/h	1757	1845	0	1757	1845	0	264	1568	1568	546	1271	1568
Grp Volume(v), veh/h	55	405	0	95	386	0	125	0	80	316	0	116
Grp Sat Flow(s),veh/h/ln	1757	1845	0	1757	1845	0	1831	0	1568	1817	0	1568
Q Serve(g_s), s	1.8	11.5	0.0	3.1	10.6	0.0	3.7	0.0	2.7	9.0	0.0	4.1
Cycle Q Clear(g_c), s	1.8	11.5	0.0	3.1	10.6	0.0	3.7	0.0	2.7	9.0	0.0	4.1
Prop In Lane	1.00		0.00	1.00		0.00	0.14		1.00	0.30		1.00
Lane Grp Cap(c), veh/h	146	584	0	176	615	0	305	0	261	273	0	235
V/C Ratio(X)	0.38	0.69	0.00	0.54	0.63	0.00	0.41	0.00	0.31	1.16	0.00	0.49
Avail Cap(c_a), veh/h	146	584	0	176	615	0	305	0	261	273	0	235
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.0	17.9	0.0	25.7	16.9	0.0	22.4	0.0	22.0	25.5	0.0	23.4
Incr Delay (d2), s/veh	7.2	6.6	0.0	11.4	4.8	0.0	4.0	0.0	3.0	104.6	0.0	7.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	6.9	0.0	2.1	6.2	0.0	2.2	0.0	1.4	12.4	0.0	2.2
LnGrp Delay(d),s/veh	33.2	24.6	0.0	37.1	21.7	0.0	26.4	0.0	25.0	130.1	0.0	30.6
LnGrp LOS	C	C		D	C		C		C	F		C
Approach Vol, veh/h		460			481			205			432	
Approach Delay, s/veh		25.6			24.7			25.8			103.4	
Approach LOS		C			C			C			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		14.0	10.0	23.0		13.0	9.0	24.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		10.0	6.0	19.0		9.0	5.0	20.0				
Max Q Clear Time (g_c+I1), s		5.7	5.1	13.5		11.0	3.8	12.6				
Green Ext Time (p_c), s		0.3	0.0	2.3		0.0	0.0	2.9				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			46.7									
HCM 2010 LOS			D									

HCM Signalized Intersection Capacity Analysis  
 8: A Street & W. 18th Street/E. 18th Street

Cumulative PM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	227	53	316	160	147	91	453	282	168	481	18
Future Volume (vph)	91	227	53	316	160	147	91	453	282	168	481	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1792		1665	1723	1568	1752	3505	1568	1752	3485	
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1792		1665	1723	1568	1752	3505	1568	1752	3485	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	247	58	343	174	160	99	492	307	183	523	20
RTOR Reduction (vph)	0	6	0	0	0	122	0	0	241	0	2	0
Lane Group Flow (vph)	99	299	0	254	263	38	99	492	66	183	541	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	35.0	35.0		32.0	32.0	32.0	13.0	29.0	29.0	23.0	39.0	
Effective Green, g (s)	35.0	35.0		32.0	32.0	32.0	13.0	29.0	29.0	23.0	39.0	
Actuated g/C Ratio	0.26	0.26		0.24	0.24	0.24	0.10	0.21	0.21	0.17	0.29	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	454	464		394	408	371	168	752	336	298	1006	
v/s Ratio Prot	0.06	c0.17		0.15	c0.15		0.06	c0.14		c0.10	0.16	
v/s Ratio Perm						0.02			0.04			
v/c Ratio	0.22	0.64		0.64	0.64	0.10	0.59	0.65	0.20	0.61	0.54	
Uniform Delay, d1	39.3	44.5		46.4	46.4	40.3	58.4	48.4	43.4	51.9	40.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	6.7		7.9	7.6	0.6	14.3	4.4	1.3	9.1	2.1	
Delay (s)	40.4	51.2		54.3	54.0	40.8	72.7	52.8	44.8	61.0	42.5	
Level of Service	D	D		D	D	D	E	D	D	E	D	
Approach Delay (s)		48.6			51.0			52.3			47.1	
Approach LOS		D			D			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			50.0				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			135.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			63.3%				ICU Level of Service			B		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 9: Service Road & Evergreen Avenue/Driveway & E. 18th Street

Cumulative PM Conditions  
 07/12/2017



Movement	EBL	EBT	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR2	NEL2
Lane Configurations												
Traffic Volume (vph)	41	594	14	578	11	11	3	27	22	3	31	2
Future Volume (vph)	41	594	14	578	11	11	3	27	22	3	31	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0			4.0			4.0		
Lane Util. Factor	1.00	0.95	1.00	0.95			1.00			1.00		
Frt	1.00	1.00	1.00	1.00			0.91			0.92		
Flt Protected	0.95	1.00	0.95	1.00			0.99			0.98		
Satd. Flow (prot)	1752	3505	1752	3495			1658			1673		
Flt Permitted	0.95	1.00	0.95	1.00			0.99			0.98		
Satd. Flow (perm)	1752	3505	1752	3495			1658			1673		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	646	15	628	12	12	3	29	24	3	34	2
RTOR Reduction (vph)	0	0	0	1	0	0	26	0	0	55	0	0
Lane Group Flow (vph)	45	646	15	639	0	0	18	0	0	6	0	0
Turn Type	Prot	NA	Prot	NA		Split	NA		Split	NA		Prot
Protected Phases	7	4	3	8		5	5		6	6		2
Permitted Phases												
Actuated Green, G (s)	10.0	39.0	7.0	36.0			9.0			10.0		
Effective Green, g (s)	10.0	39.0	7.0	36.0			9.0			10.0		
Actuated g/C Ratio	0.10	0.39	0.07	0.36			0.09			0.10		
Clearance Time (s)	4.0	4.0	4.0	4.0			4.0			4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0			3.0			3.0		
Lane Grp Cap (vph)	175	1366	122	1258			149			167		
v/s Ratio Prot	c0.03	c0.18	0.01	c0.18			c0.01			c0.00		
v/s Ratio Perm												
v/c Ratio	0.26	0.47	0.12	0.51			0.12			0.04		
Uniform Delay, d1	41.6	22.8	43.6	25.1			41.9			40.6		
Progression Factor	1.00	1.00	1.00	1.00			1.00			1.00		
Incremental Delay, d2	3.5	1.2	2.1	1.5			1.6			0.4		
Delay (s)	45.1	24.0	45.7	26.5			43.5			41.1		
Level of Service	D	C	D	C			D			D		
Approach Delay (s)		25.4		27.0			43.5			41.1		
Approach LOS		C		C			D			D		

Intersection Summary

HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group























Movement	NEL	NER2
Lane Configurations		
Traffic Volume (vph)	0	10
Future Volume (vph)	0	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frt	0.89	
Flt Protected	0.99	
Satd. Flow (prot)	1621	
Flt Permitted	0.99	
Satd. Flow (perm)	1621	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	0	11
RTOR Reduction (vph)	11	0
Lane Group Flow (vph)	2	0
Turn Type	Prot	
Protected Phases	2	
Permitted Phases		
Actuated Green, G (s)	15.0	
Effective Green, g (s)	15.0	
Actuated g/C Ratio	0.15	
Clearance Time (s)	4.0	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	243	
v/s Ratio Prot	c0.00	
v/s Ratio Perm		
v/c Ratio	0.01	
Uniform Delay, d1	36.2	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	36.2	
Level of Service	D	
Approach Delay (s)	36.2	
Approach LOS	D	

Intersection Summary

HCM 2010 Signalized Intersection Summary  
 10: Cavallo Road & E. 18th Street

Cumulative PM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	406	80	41	415	104	65	73	44	79	105	130
Future Volume (veh/h)	112	406	80	41	415	104	65	73	44	79	105	130
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	122	441	87	45	451	113	71	79	48	86	114	141
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	351	1096	215	198	800	199	366	390	237	479	272	337
Arrive On Green	0.20	0.38	0.38	0.11	0.29	0.29	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1757	2923	573	1757	2783	692	1109	1076	654	1246	751	929
Grp Volume(v), veh/h	122	263	265	45	283	281	71	0	127	86	0	255
Grp Sat Flow(s),veh/h/ln	1757	1752	1744	1757	1752	1723	1109	0	1729	1246	0	1681
Q Serve(g_s), s	4.8	8.8	9.0	1.9	11.0	11.1	4.1	0.0	4.0	4.1	0.0	9.1
Cycle Q Clear(g_c), s	4.8	8.8	9.0	1.9	11.0	11.1	13.2	0.0	4.0	8.1	0.0	9.1
Prop In Lane	1.00		0.33	1.00		0.40	1.00		0.38	1.00		0.55
Lane Grp Cap(c), veh/h	351	657	654	198	504	495	366	0	627	479	0	609
V/C Ratio(X)	0.35	0.40	0.41	0.23	0.56	0.57	0.19	0.00	0.20	0.18	0.00	0.42
Avail Cap(c_a), veh/h	351	657	654	198	504	495	366	0	627	479	0	609
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.5	18.4	18.4	32.3	24.2	24.3	24.1	0.0	17.5	20.3	0.0	19.2
Incr Delay (d2), s/veh	2.7	1.8	1.9	2.7	4.5	4.7	1.2	0.0	0.7	0.8	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	4.6	4.6	1.0	5.9	5.9	1.4	0.0	2.0	1.5	0.0	4.5
LnGrp Delay(d),s/veh	30.2	20.2	20.3	35.0	28.7	28.9	25.3	0.0	18.3	21.2	0.0	21.3
LnGrp LOS	C	C	C	C	C	C	C		B	C		C
Approach Vol, veh/h		650			609			198			341	
Approach Delay, s/veh		22.1			29.3			20.8			21.2	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		33.0	13.0	34.0		33.0	20.0	27.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		29.0	9.0	30.0		29.0	16.0	23.0				
Max Q Clear Time (g_c+I1), s		15.2	3.9	11.0		11.1	6.8	13.1				
Green Ext Time (p_c), s		2.5	0.0	6.8		2.8	0.2	4.7				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			24.2									
HCM 2010 LOS			C									



HCM Signalized Intersection Capacity Analysis  
 11: Hillcrest Avenue & E. 18th Street




















Cumulative PM Conditions  
 07/12/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	296	175	278	260	26	242	227	420	33	112	34
Future Volume (vph)	37	296	175	278	260	26	242	227	420	33	112	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3310		1752	3458		1665	1744	1568	1752	1845	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	3310		1752	3458		1665	1744	1568	1752	1845	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	322	190	302	283	28	263	247	457	36	122	37
RTOR Reduction (vph)	0	75	0	0	7	0	0	0	330	0	0	32
Lane Group Flow (vph)	40	437	0	302	304	0	237	273	127	36	122	5
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			6
Actuated Green, G (s)	6.0	24.0		27.0	45.0		32.0	32.0	32.0	16.0	16.0	16.0
Effective Green, g (s)	6.0	24.0		27.0	45.0		32.0	32.0	32.0	16.0	16.0	16.0
Actuated g/C Ratio	0.05	0.21		0.23	0.39		0.28	0.28	0.28	0.14	0.14	0.14
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	91	690		411	1353		463	485	436	243	256	218
v/s Ratio Prot	0.02	c0.13		c0.17	0.09		0.14	c0.16		0.02	c0.07	
v/s Ratio Perm									0.08			0.00
v/c Ratio	0.44	0.63		0.73	0.22		0.51	0.56	0.29	0.15	0.48	0.02
Uniform Delay, d1	52.9	41.5		40.7	23.4		34.9	35.5	32.6	43.5	45.6	42.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.7	4.4		11.1	0.4		4.0	4.7	1.7	1.3	6.2	0.2
Delay (s)	67.5	45.9		51.8	23.7		38.9	40.2	34.3	44.8	51.9	43.0
Level of Service	E	D		D	C		D	D	C	D	D	D
Approach Delay (s)		47.4			37.6			37.1			48.9	
Approach LOS		D			D			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			40.7				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.61									
Actuated Cycle Length (s)			115.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			61.1%				ICU Level of Service			B		
Analysis Period (min)			15									

c Critical Lane Group

HCM 2010 Signalized Intersection Summary  
 1: A Street & W. 9th Street/Wilbur Avenue
























Cumulative+Project AM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	19	13	204	51	231	8	144	214	109	96	5
Future Volume (veh/h)	3	19	13	204	51	231	8	144	214	109	96	5
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1900	1900	1845	1845	1900	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	3	21	14	227	57	257	9	160	238	121	107	0
Adj No. of Lanes	0	1	0	0	1	1	0	1	1	1	1	1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	32	225	150	335	84	370	60	399	348	146	666	566
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.22	0.22	0.22	0.08	0.36	0.00
Sat Flow, veh/h	136	954	636	1418	356	1568	34	1796	1568	1757	1845	1568
Grp Volume(v), veh/h	38	0	0	284	0	257	169	0	238	121	107	0
Grp Sat Flow(s),veh/h/ln	1726	0	0	1774	0	1568	1829	0	1568	1757	1845	1568
Q Serve(g_s), s	1.2	0.0	0.0	10.5	0.0	10.8	0.0	0.0	10.0	4.9	2.8	0.0
Cycle Q Clear(g_c), s	1.2	0.0	0.0	10.5	0.0	10.8	5.6	0.0	10.0	4.9	2.8	0.0
Prop In Lane	0.08		0.37	0.80		1.00	0.05		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	407	0	0	419	0	370	459	0	348	146	666	566
V/C Ratio(X)	0.09	0.00	0.00	0.68	0.00	0.69	0.37	0.00	0.68	0.83	0.16	0.00
Avail Cap(c_a), veh/h	407	0	0	419	0	370	459	0	348	146	666	566
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.5	0.0	0.0	25.0	0.0	25.1	24.0	0.0	25.7	32.5	15.6	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	8.5	0.0	10.3	2.3	0.0	10.4	39.0	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	6.1	0.0	5.7	3.2	0.0	5.3	3.9	1.5	0.0
LnGrp Delay(d),s/veh	21.9	0.0	0.0	33.6	0.0	35.4	26.2	0.0	36.1	71.5	16.1	0.0
LnGrp LOS	C			C		D	C		D	E	B	
Approach Vol, veh/h		38			541			407			228	
Approach Delay, s/veh		21.9			34.4			32.0			45.5	
Approach LOS		C			C			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	10.0	20.0		21.0		30.0		21.0				
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	6.0	16.0		17.0		26.0		17.0				
Max Q Clear Time (g_c+I1), s	6.9	12.0		3.2		4.8		12.8				
Green Ext Time (p_c), s	0.0	0.9		0.1		2.4		1.1				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				35.3								
HCM 2010 LOS				D								

HCM 2010 Signalized Intersection Summary  
 2: Cavallo Road/Fulton Shipyard Road & Wilbur Avenue




















Cumulative+Project AM Conditions

07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	217	114	41	304	17	154	10	79	7	7	19
Future Volume (veh/h)	10	217	114	41	304	17	154	10	79	7	7	19
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1845	1845	1845	1845	1845	1845	1900
Adj Flow Rate, veh/h	11	241	127	46	338	19	171	11	88	8	8	21
Adj No. of Lanes	1	2	0	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	107	919	468	183	834	709	382	529	450	107	59	154
Arrive On Green	0.06	0.41	0.41	0.10	0.45	0.45	0.22	0.29	0.29	0.06	0.13	0.13
Sat Flow, veh/h	1757	2249	1146	1757	1845	1568	1757	1845	1568	1757	451	1184
Grp Volume(v), veh/h	11	186	182	46	338	19	171	11	88	8	0	29
Grp Sat Flow(s),veh/h/ln	1757	1752	1642	1757	1845	1568	1757	1845	1568	1757	0	1636
Q Serve(g_s), s	0.7	8.1	8.5	2.8	14.1	0.8	9.7	0.5	4.9	0.5	0.0	1.8
Cycle Q Clear(g_c), s	0.7	8.1	8.5	2.8	14.1	0.8	9.7	0.5	4.9	0.5	0.0	1.8
Prop In Lane	1.00		0.70	1.00		1.00	1.00		1.00	1.00		0.72
Lane Grp Cap(c), veh/h	107	716	671	183	834	709	382	529	450	107	0	213
V/C Ratio(X)	0.10	0.26	0.27	0.25	0.41	0.03	0.45	0.02	0.20	0.07	0.00	0.14
Avail Cap(c_a), veh/h	107	716	671	183	834	709	382	529	450	107	0	213
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.0	22.5	22.6	47.4	21.1	17.5	39.0	29.4	31.0	50.9	0.0	44.3
Incr Delay (d2), s/veh	1.9	0.9	1.0	3.3	1.5	0.1	3.8	0.1	1.0	1.4	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.0	4.0	1.5	7.5	0.3	5.1	0.3	2.2	0.3	0.0	0.9
LnGrp Delay(d),s/veh	53.0	23.4	23.6	50.6	22.6	17.5	42.8	29.5	31.9	52.3	0.0	45.6
LnGrp LOS	D	C	C	D	C	B	D	C	C	D		D
Approach Vol, veh/h		379			403			270				37
Approach Delay, s/veh		24.3			25.6			38.7				47.0
Approach LOS		C			C			D				D
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	37.0	16.0	51.0	29.0	19.0	11.0	56.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	7.0	33.0	12.0	47.0	25.0	15.0	7.0	52.0				
Max Q Clear Time (g_c+I1), s	2.5	6.9	4.8	10.5	11.7	3.8	2.7	16.1				
Green Ext Time (p_c), s	0.0	0.5	0.0	5.0	0.4	0.3	0.0	5.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			29.1									
HCM 2010 LOS			C									



















HCM 2010 Signalized Intersection Summary  
3: G Street & W. 10th Street

Cumulative+Project AM Conditions  
07/13/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	285	61	64	485	43	48	133	54	89	175	19
Future Volume (veh/h)	11	285	61	64	485	43	48	133	54	89	175	19
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1900
Adj Flow Rate, veh/h	12	300	64	67	511	45	51	140	57	94	184	20
Adj No. of Lanes	0	1	1	0	1	1	0	1	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	74	990	862	139	881	862	177	437	497	195	342	33
Arrive On Green	0.55	0.55	0.55	0.55	0.55	0.55	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	21	1800	1568	132	1603	1568	319	1381	1568	366	1081	104
Grp Volume(v), veh/h	312	0	64	578	0	45	191	0	57	298	0	0
Grp Sat Flow(s),veh/h/ln	1820	0	1568	1734	0	1568	1700	0	1568	1551	0	0
Q Serve(g_s), s	0.0	0.0	1.1	1.9	0.0	0.8	0.0	0.0	1.5	5.0	0.0	0.0
Cycle Q Clear(g_c), s	5.5	0.0	1.1	12.6	0.0	0.8	4.7	0.0	1.5	9.7	0.0	0.0
Prop In Lane	0.04		1.00	0.12		1.00	0.27		1.00	0.32		0.07
Lane Grp Cap(c), veh/h	1063	0	862	1021	0	862	614	0	497	570	0	0
V/C Ratio(X)	0.29	0.00	0.07	0.57	0.00	0.05	0.31	0.00	0.11	0.52	0.00	0.00
Avail Cap(c_a), veh/h	1063	0	862	1021	0	862	614	0	497	570	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.3	0.0	6.3	8.9	0.0	6.3	15.6	0.0	14.5	17.2	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.0	0.2	2.3	0.0	0.1	1.3	0.0	0.5	3.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	0.5	6.9	0.0	0.4	2.6	0.0	0.7	4.7	0.0	0.0
LnGrp Delay(d),s/veh	8.0	0.0	6.5	11.1	0.0	6.4	16.9	0.0	15.0	20.6	0.0	0.0
LnGrp LOS	A		A	B		A	B		B	C		
Approach Vol, veh/h		376			623			248			298	
Approach Delay, s/veh		7.8			10.8			16.5			20.6	
Approach LOS		A			B			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		23.0		37.0		23.0		37.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		19.0		33.0		19.0		33.0				
Max Q Clear Time (g_c+I1), s		6.7		7.5		11.7		14.6				
Green Ext Time (p_c), s		2.6		7.0		1.9		6.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			12.9									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary  
4: A Street & W. 10th Street/Beede Way

Cumulative+Project AM Conditions  
07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	13	262	13	17	8	253	224	10	3	220	228
Future Volume (veh/h)	160	13	262	13	17	8	253	224	10	3	220	228
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1900	1845	1900	1845	1845	1900	1900	1845	1900
Adj Flow Rate, veh/h	174	14	0	14	18	9	275	243	11	3	239	248
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	410	430	0	46	60	30	527	1898	86	42	388	301
Arrive On Green	0.23	0.23	0.00	0.08	0.08	0.08	0.30	0.56	0.56	0.21	0.21	0.21
Sat Flow, veh/h	1757	1845	0	597	767	384	1757	3416	154	5	1836	1427
Grp Volume(v), veh/h	174	14	0	41	0	0	275	124	130	242	0	248
Grp Sat Flow(s),veh/h/ln	1757	1845	0	1747	0	0	1757	1752	1817	1841	0	1427
Q Serve(g_s), s	7.6	0.5	0.0	2.0	0.0	0.0	11.7	3.1	3.1	0.0	0.0	14.9
Cycle Q Clear(g_c), s	7.6	0.5	0.0	2.0	0.0	0.0	11.7	3.1	3.1	10.7	0.0	14.9
Prop In Lane	1.00		0.00	0.34		0.22	1.00		0.08	0.01		1.00
Lane Grp Cap(c), veh/h	410	430	0	136	0	0	527	974	1010	429	0	301
V/C Ratio(X)	0.42	0.03	0.00	0.30	0.00	0.00	0.52	0.13	0.13	0.56	0.00	0.82
Avail Cap(c_a), veh/h	410	430	0	136	0	0	527	974	1010	429	0	301
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.4	26.7	0.0	39.2	0.0	0.0	26.1	9.6	9.6	32.2	0.0	33.9
Incr Delay (d2), s/veh	3.2	0.1	0.0	5.6	0.0	0.0	3.7	0.3	0.3	5.3	0.0	21.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.3	0.0	1.2	0.0	0.0	6.2	1.5	1.6	6.1	0.0	7.7
LnGrp Delay(d),s/veh	32.6	26.8	0.0	44.8	0.0	0.0	29.8	9.8	9.8	37.5	0.0	55.7
LnGrp LOS	C	C		D			C	A	A	D		E
Approach Vol, veh/h		188			41			529			490	
Approach Delay, s/veh		32.1			44.8			20.2			46.7	
Approach LOS		C			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		54.0		25.0	31.0	23.0		11.0				
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s		50.0		21.0	27.0	19.0		7.0				
Max Q Clear Time (g_c+I1), s		5.1		9.6	13.7	16.9		4.0				
Green Ext Time (p_c), s		5.4		0.4	0.7	0.9		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				33.2								
HCM 2010 LOS				C								

**Intersection**

Int Delay, s/veh 3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Traffic Vol, veh/h	0	0	43	41	0	96	14	434	75	89	393	1
Future Vol, veh/h	0	0	43	41	0	96	14	434	75	89	393	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	47	45	0	104	15	472	82	97	427	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	887	1205	214	950	1165	277	428	0	0	553	0	0
Stage 1	621	621	-	543	543	-	-	-	-	-	-	-
Stage 2	266	584	-	407	622	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	237	181	788	213	191	717	1121	-	-	1006	-	-
Stage 1	439	475	-	489	515	-	-	-	-	-	-	-
Stage 2	714	494	-	589	475	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	180	155	788	178	163	717	1121	-	-	1006	-	-
Mov Cap-2 Maneuver	180	155	-	178	163	-	-	-	-	-	-	-
Stage 1	430	415	-	479	505	-	-	-	-	-	-	-
Stage 2	598	484	-	484	415	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.9	20.7	0.2	2
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1121	-	-	788	376	1006	-	-
HCM Lane V/C Ratio	0.014	-	-	0.059	0.396	0.096	-	-
HCM Control Delay (s)	8.3	-	-	9.9	20.7	9	0.4	-
HCM Lane LOS	A	-	-	A	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	1.8	0.3	-	-

**Intersection**

Int Delay, s/veh 4.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	26	158	86	238	209	26
Future Vol, veh/h	26	158	86	238	209	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	175	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	29	176	96	264	232	29























Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	703	247	261	0	-
Stage 1	247	-	-	-	-
Stage 2	456	-	-	-	-
Critical Hdwy	7.13	6.23	4.13	-	-
Critical Hdwy Stg 1	6.13	-	-	-	-
Critical Hdwy Stg 2	6.13	-	-	-	-
Follow-up Hdwy	3.527	3.327	2.227	-	-
Pot Cap-1 Maneuver	351	789	1298	-	-
Stage 1	755	-	-	-	-
Stage 2	582	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	331	789	1298	-	-
Mov Cap-2 Maneuver	331	-	-	-	-
Stage 1	699	-	-	-	-
Stage 2	539	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1298	-	660	-	-
HCM Lane V/C Ratio	0.074	-	0.31	-	-
HCM Control Delay (s)	8	-	12.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.3	-	-

HCM 2010 Signalized Intersection Summary  
7: G Street & W. 18th Street

Cumulative+Project AM Conditions  
07/13/2017
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	153	151	71	274	67	196	123	77	113	116	137
Future Volume (veh/h)	47	153	151	71	274	67	196	123	77	113	116	137
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1845	1845	1845	1845	1900	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	51	166	0	77	298	0	213	134	34	123	126	149
Adj No. of Lanes	1	1	1	1	1	1	0	1	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	70	392	333	97	420	357	264	166	377	169	173	298
Arrive On Green	0.04	0.21	0.00	0.06	0.23	0.00	0.24	0.24	0.24	0.19	0.19	0.19
Sat Flow, veh/h	1757	1845	1568	1757	1845	1568	1099	691	1568	889	911	1568
Grp Volume(v), veh/h	51	166	0	77	298	0	347	0	34	249	0	149
Grp Sat Flow(s),veh/h/ln	1757	1845	1568	1757	1845	1568	1790	0	1568	1800	0	1568
Q Serve(g_s), s	1.5	4.1	0.0	2.3	7.9	0.0	9.7	0.0	0.9	6.9	0.0	4.5
Cycle Q Clear(g_c), s	1.5	4.1	0.0	2.3	7.9	0.0	9.7	0.0	0.9	6.9	0.0	4.5
Prop In Lane	1.00		1.00	1.00		1.00	0.61		1.00	0.49		1.00
Lane Grp Cap(c), veh/h	70	392	333	97	420	357	430	0	377	342	0	298
V/C Ratio(X)	0.73	0.42	0.00	0.80	0.71	0.00	0.81	0.00	0.09	0.73	0.00	0.50
Avail Cap(c_a), veh/h	166	731	622	166	731	622	574	0	503	544	0	474
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.1	18.1	0.0	24.7	18.8	0.0	19.0	0.0	15.6	20.2	0.0	19.2
Incr Delay (d2), s/veh	13.4	0.7	0.0	13.6	2.2	0.0	6.2	0.0	0.1	3.0	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	2.2	0.0	1.5	4.2	0.0	5.5	0.0	0.4	3.7	0.0	2.0
LnGrp Delay(d),s/veh	38.6	18.8	0.0	38.4	21.1	0.0	25.1	0.0	15.7	23.1	0.0	20.5
LnGrp LOS	D	B		D	C		C		B	C		C
Approach Vol, veh/h		217			375			381			398	
Approach Delay, s/veh		23.4			24.6			24.3			22.1	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		16.7	6.9	15.2		14.1	6.1	16.1				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	5.0	21.0		16.0	5.0	21.0				
Max Q Clear Time (g_c+I1), s		11.7	4.3	6.1		8.9	3.5	9.9				
Green Ext Time (p_c), s		1.1	0.0	2.5		1.2	0.0	2.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			23.6									
HCM 2010 LOS			C									



HCM Signalized Intersection Capacity Analysis  
8: A Street & W. 18th Street/E. 18th Street

Cumulative+Project AM Conditions

07/12/2017

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	64	199	58	272	209	203	72	545	211	113	566	22	
Future Volume (vph)	64	199	58	272	209	203	72	545	211	113	566	22	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95		
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		
Flt Protected	0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (prot)	1752	1782		1665	1740	1568	1752	3505	1568	1752	3485		
Flt Permitted	0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00		
Satd. Flow (perm)	1752	1782		1665	1740	1568	1752	3505	1568	1752	3485		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	70	216	63	296	227	221	78	592	229	123	615	24	
RTOR Reduction (vph)	0	9	0	0	0	169	0	0	160	0	2	0	
Lane Group Flow (vph)	70	270	0	258	265	52	78	592	69	123	637	0	
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA		
Protected Phases	4	4		8	8		5	2		1	6		
Permitted Phases						8			2				
Actuated Green, G (s)	25.0	25.0		28.0	28.0	28.0	12.0	36.0	36.0	15.0	39.0		
Effective Green, g (s)	25.0	25.0		28.0	28.0	28.0	12.0	36.0	36.0	15.0	39.0		
Actuated g/C Ratio	0.21	0.21		0.23	0.23	0.23	0.10	0.30	0.30	0.12	0.32		
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Lane Grp Cap (vph)	365	371		388	406	365	175	1051	470	219	1132		
v/s Ratio Prot	0.04	c0.15		c0.15	0.15		0.04	0.17		c0.07	c0.18		
v/s Ratio Perm						0.03			0.04				
v/c Ratio	0.19	0.73		0.66	0.65	0.14	0.45	0.56	0.15	0.56	0.56		
Uniform Delay, d1	39.2	44.3		41.7	41.6	36.5	50.9	35.4	30.7	49.4	33.5		
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
Incremental Delay, d2	1.2	11.9		8.7	7.9	0.8	8.0	2.2	0.7	10.0	2.0		
Delay (s)	40.3	56.2		50.4	49.5	37.3	58.9	37.6	31.4	59.4	35.5		
Level of Service	D	E		D	D	D	E	D	C	E	D		
Approach Delay (s)		53.0			46.2			37.8			39.3		
Approach LOS		D			D			D			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay	42.4			HCM 2000 Level of Service					D				
HCM 2000 Volume to Capacity ratio	0.64												
Actuated Cycle Length (s)	120.0			Sum of lost time (s)					16.0				
Intersection Capacity Utilization	61.7%			ICU Level of Service					B				
Analysis Period (min)	15												

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 9: Service Road & Evergreen Avenue/Driveway & E. 18th Street

Cumulative+Project AM Conditions

07/12/2017



Movement	EBL	EBT	EBR	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR2
Lane Configurations												
Traffic Volume (vph)	21	460	1	47	653	2	10	1	89	7	4	23
Future Volume (vph)	21	460	1	47	653	2	10	1	89	7	4	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.88			0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1752	3504		1752	3503			1615			1658	
Flt Permitted	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (perm)	1752	3504		1752	3503			1615			1658	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	500	1	51	710	2	11	1	97	8	4	25
RTOR Reduction (vph)	0	0	0	0	0	0	0	85	0	0	34	0
Lane Group Flow (vph)	23	501	0	51	712	0	0	24	0	0	3	0
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	
Protected Phases	7	4		3	8		5	5		6	6	
Permitted Phases												
Actuated Green, G (s)	10.0	39.0		11.0	40.0			12.0			7.0	
Effective Green, g (s)	10.0	39.0		11.0	40.0			12.0			7.0	
Actuated g/C Ratio	0.10	0.39		0.11	0.40			0.12			0.07	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	175	1366		192	1401			193			116	
v/s Ratio Prot	0.01	0.14		c0.03	c0.20			c0.01			c0.00	
v/s Ratio Perm												
v/c Ratio	0.13	0.37		0.27	0.51			0.12			0.02	
Uniform Delay, d1	41.0	21.7		40.8	22.6			39.3			43.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	1.6	0.8		3.4	1.3			1.3			0.4	
Delay (s)	42.6	22.5		44.2	23.9			40.6			43.7	
Level of Service	D	C		D	C			D			D	
Approach Delay (s)		23.4			25.3			40.6			43.7	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 9: Service Road & Evergreen Avenue/Driveway & E. 18th Street

Cumulative+Project AM Conditions

07/12/2017























Movement	NEL2	NEL
Lane Configurations		
Traffic Volume (vph)	4	0
Future Volume (vph)	4	0
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		4.0
Lane Util. Factor		1.00
Frt		1.00
Flt Protected		0.95
Satd. Flow (prot)		1752
Flt Permitted		0.95
Satd. Flow (perm)		1752
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	4	0
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	4
Turn Type	Prot	Prot
Protected Phases	2	2
Permitted Phases		
Actuated Green, G (s)		11.0
Effective Green, g (s)		11.0
Actuated g/C Ratio		0.11
Clearance Time (s)		4.0
Vehicle Extension (s)		3.0
Lane Grp Cap (vph)		192
v/s Ratio Prot		c0.00
v/s Ratio Perm		
v/c Ratio		0.02
Uniform Delay, d1		39.7
Progression Factor		1.00
Incremental Delay, d2		0.2
Delay (s)		39.9
Level of Service		D
Approach Delay (s)		39.9
Approach LOS		D

Intersection Summary

HCM 2010 Signalized Intersection Summary  
 10: Cavallo Road & E. 18th Street























Cumulative+Project AM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	209	247	62	42	438	151	77	113	35	127	104	172
Future Volume (veh/h)	209	247	62	42	438	151	77	113	35	127	104	172
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	227	268	67	46	476	164	84	123	38	138	113	187
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	351	1151	283	220	866	296	261	423	131	385	196	324
Arrive On Green	0.20	0.41	0.41	0.13	0.34	0.34	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1757	2791	685	1757	2565	878	1064	1353	418	1208	626	1036
Grp Volume(v), veh/h	227	166	169	46	324	316	84	0	161	138	0	300
Grp Sat Flow(s),veh/h/ln	1757	1752	1724	1757	1752	1690	1064	0	1771	1208	0	1662
Q Serve(g_s), s	9.5	4.9	5.1	1.9	12.0	12.2	5.8	0.0	5.5	7.8	0.0	12.1
Cycle Q Clear(g_c), s	9.5	4.9	5.1	1.9	12.0	12.2	17.9	0.0	5.5	13.3	0.0	12.1
Prop In Lane	1.00		0.40	1.00		0.52	1.00		0.24	1.00		0.62
Lane Grp Cap(c), veh/h	351	723	711	220	591	570	261	0	553	385	0	519
V/C Ratio(X)	0.65	0.23	0.24	0.21	0.55	0.55	0.32	0.00	0.29	0.36	0.00	0.58
Avail Cap(c_a), veh/h	351	723	711	220	591	570	261	0	553	385	0	519
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.4	15.3	15.3	31.4	21.5	21.6	30.6	0.0	20.8	25.8	0.0	23.1
Incr Delay (d2), s/veh	8.9	0.7	0.8	2.2	3.6	3.8	3.2	0.0	1.3	2.6	0.0	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	2.5	2.5	1.0	6.4	6.2	1.9	0.0	2.9	2.9	0.0	6.2
LnGrp Delay(d),s/veh	38.3	16.0	16.1	33.6	25.2	25.4	33.8	0.0	22.1	28.4	0.0	27.7
LnGrp LOS	D	B	B	C	C	C	C		C	C		C
Approach Vol, veh/h		562			686			245			438	
Approach Delay, s/veh		25.0			25.9			26.1			27.9	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		29.0	14.0	37.0		29.0	20.0	31.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		25.0	10.0	33.0		25.0	16.0	27.0				
Max Q Clear Time (g_c+I1), s		19.9	3.9	7.1		15.3	11.5	14.2				
Green Ext Time (p_c), s		1.8	0.0	6.7		2.7	0.3	5.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			26.1									
HCM 2010 LOS			C									

HCM Signalized Intersection Capacity Analysis  
 11: Hillcrest Avenue & E. 18th Street

Cumulative+Project AM Conditions




















07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	182	182	288	310	18	292	109	319	26	123	47
Future Volume (vph)	40	182	182	288	310	18	292	109	319	26	123	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frt	1.00	0.93		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3242		1752	3475		1665	1713	1568	1752	1845	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	3242		1752	3475		1665	1713	1568	1752	1845	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	198	198	313	337	20	317	118	347	28	134	51
RTOR Reduction (vph)	0	172	0	0	4	0	0	0	254	0	0	43
Lane Group Flow (vph)	43	224	0	313	353	0	216	219	93	28	134	8
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			6
Actuated Green, G (s)	5.0	14.0		31.0	40.0		28.0	28.0	28.0	16.0	16.0	16.0
Effective Green, g (s)	5.0	14.0		31.0	40.0		28.0	28.0	28.0	16.0	16.0	16.0
Actuated g/C Ratio	0.05	0.13		0.30	0.38		0.27	0.27	0.27	0.15	0.15	0.15
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	83	432		517	1323		444	456	418	266	281	238
v/s Ratio Prot	0.02	c0.07		c0.18	0.10		c0.13	0.13		0.02	c0.07	
v/s Ratio Perm									0.06			0.00
v/c Ratio	0.52	0.52		0.61	0.27		0.49	0.48	0.22	0.11	0.48	0.03
Uniform Delay, d1	48.8	42.4		31.8	22.4		32.4	32.4	30.0	38.3	40.7	37.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.2	4.4		5.2	0.5		3.8	3.6	1.2	0.8	5.7	0.3
Delay (s)	70.1	46.8		36.9	22.9		36.2	36.0	31.2	39.1	46.4	38.2
Level of Service	E	D		D	C		D	D	C	D	D	D
Approach Delay (s)		49.1			29.5			33.9			43.5	
Approach LOS		D			C			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			36.6			HCM 2000 Level of Service			D			
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			105.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			57.6%			ICU Level of Service			B			
Analysis Period (min)			15									

c Critical Lane Group
























HCM 2010 Signalized Intersection Summary  
 1: A Street & W. 9th Street/Wilbur Avenue

Cumulative+Project PM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	38	18	120	27	131	11	191	341	238	159	3
Future Volume (veh/h)	2	38	18	120	27	131	11	191	341	238	159	3
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1900	1900	1845	1845	1900	1845	1845	1845	1845	1845
Adj Flow Rate, veh/h	2	41	20	130	29	142	12	208	371	259	173	0
Adj No. of Lanes	0	1	0	0	1	1	0	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	10	203	99	259	58	281	51	488	429	351	951	809
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.27	0.27	0.27	0.20	0.52	0.00
Sat Flow, veh/h	55	1135	554	1449	323	1568	39	1785	1568	1757	1845	1568
Grp Volume(v), veh/h	63	0	0	159	0	142	220	0	371	259	173	0
Grp Sat Flow(s),veh/h/ln	1744	0	0	1772	0	1568	1824	0	1568	1757	1845	1568
Q Serve(g_s), s	2.9	0.0	0.0	7.7	0.0	7.8	0.0	0.0	21.4	13.1	4.8	0.0
Cycle Q Clear(g_c), s	2.9	0.0	0.0	7.7	0.0	7.8	9.3	0.0	21.4	13.1	4.8	0.0
Prop In Lane	0.03		0.32	0.82		1.00	0.05		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	312	0	0	317	0	281	539	0	429	351	951	809
V/C Ratio(X)	0.20	0.00	0.00	0.50	0.00	0.51	0.41	0.00	0.86	0.74	0.18	0.00
Avail Cap(c_a), veh/h	312	0	0	317	0	281	539	0	429	351	951	809
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.2	0.0	0.0	35.2	0.0	35.2	28.5	0.0	32.8	35.7	12.3	0.0
Incr Delay (d2), s/veh	1.5	0.0	0.0	5.6	0.0	6.4	2.3	0.0	20.1	12.9	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	4.2	0.0	3.9	5.1	0.0	11.7	7.6	2.5	0.0
LnGrp Delay(d),s/veh	34.7	0.0	0.0	40.7	0.0	41.6	30.7	0.0	53.0	48.6	12.7	0.0
LnGrp LOS	C			D		D	C		D	D	B	
Approach Vol, veh/h		63			301			591			432	
Approach Delay, s/veh		34.7			41.1			44.7			34.2	
Approach LOS		C			D			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4		6		8				
Phs Duration (G+Y+Rc), s	23.0	30.0		21.0		53.0		21.0				
Change Period (Y+Rc), s	4.0	4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s	19.0	26.0		17.0		49.0		17.0				
Max Q Clear Time (g_c+I1), s	15.1	23.4		4.9		6.8		9.8				
Green Ext Time (p_c), s	0.3	1.0		0.2		4.0		0.8				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				40.2								
HCM 2010 LOS				D								




















HCM 2010 Signalized Intersection Summary  
 2: Cavallo Road/Fulton Shipyard Road & Wilbur Avenue

Cumulative+Project PM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	379	103	60	150	15	97	26	102	18	16	17
Future Volume (veh/h)	23	379	103	60	150	15	97	26	102	18	16	17
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1845	1845	1845	1845	1845	1845	1900
Adj Flow Rate, veh/h	26	421	114	67	167	17	108	29	113	20	18	19
Adj No. of Lanes	1	2	0	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	141	875	235	234	689	585	164	492	418	117	197	208
Arrive On Green	0.08	0.32	0.32	0.13	0.37	0.37	0.09	0.27	0.27	0.07	0.24	0.24
Sat Flow, veh/h	1757	2734	734	1757	1845	1568	1757	1845	1568	1757	823	869
Grp Volume(v), veh/h	26	268	267	67	167	17	108	29	113	20	0	37
Grp Sat Flow(s),veh/h/ln	1757	1752	1715	1757	1845	1568	1757	1845	1568	1757	0	1691
Q Serve(g_s), s	1.0	9.2	9.4	2.6	4.7	0.5	4.5	0.9	4.3	0.8	0.0	1.3
Cycle Q Clear(g_c), s	1.0	9.2	9.4	2.6	4.7	0.5	4.5	0.9	4.3	0.8	0.0	1.3
Prop In Lane	1.00		0.43	1.00		1.00	1.00		1.00	1.00		0.51
Lane Grp Cap(c), veh/h	141	561	549	234	689	585	164	492	418	117	0	406
V/C Ratio(X)	0.18	0.48	0.49	0.29	0.24	0.03	0.66	0.06	0.27	0.17	0.00	0.09
Avail Cap(c_a), veh/h	141	561	549	234	689	585	164	492	418	117	0	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.2	20.5	20.5	29.3	16.2	14.9	32.8	20.5	21.7	33.0	0.0	22.1
Incr Delay (d2), s/veh	2.9	2.9	3.1	3.0	0.8	0.1	18.9	0.2	1.6	3.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	4.9	4.9	1.4	2.5	0.2	3.0	0.5	2.0	0.5	0.0	0.6
LnGrp Delay(d),s/veh	35.1	23.4	23.6	32.3	17.0	15.0	51.7	20.7	23.3	36.2	0.0	22.6
LnGrp LOS	D	C	C	C	B	B	D	C	C	D		C
Approach Vol, veh/h		561			251			250				57
Approach Delay, s/veh		24.0			21.0			35.3				27.4
Approach LOS		C			C			D				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.0	24.0	14.0	28.0	11.0	22.0	10.0	32.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	5.0	20.0	10.0	24.0	7.0	18.0	6.0	28.0				
Max Q Clear Time (g_c+I1), s	2.8	6.3	4.6	11.4	6.5	3.3	3.0	6.7				
Green Ext Time (p_c), s	0.0	0.5	0.0	3.5	0.0	0.6	0.0	4.4				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			26.0									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary  
3: G Street & W. 10th Street

Cumulative+Project PM Conditions  
07/12/2017



















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	480	27	32	280	44	17	59	36	98	97	46
Future Volume (veh/h)	32	480	27	32	280	44	17	59	36	98	97	46
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1900
Adj Flow Rate, veh/h	35	522	29	35	304	48	18	64	39	107	105	50
Adj No. of Lanes	0	1	1	0	1	1	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	112	894	801	129	853	801	163	474	488	266	242	93
Arrive On Green	0.51	0.51	0.51	0.51	0.51	0.51	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	52	1750	1568	80	1669	1568	212	1524	1568	494	776	300
Grp Volume(v), veh/h	557	0	29	339	0	48	82	0	39	262	0	0
Grp Sat Flow(s),veh/h/ln	1802	0	1568	1750	0	1568	1735	0	1568	1570	0	0
Q Serve(g_s), s	0.0	0.0	0.4	0.0	0.0	0.7	0.0	0.0	0.8	3.0	0.0	0.0
Cycle Q Clear(g_c), s	9.5	0.0	0.4	5.0	0.0	0.7	1.4	0.0	0.8	5.9	0.0	0.0
Prop In Lane	0.06		1.00	0.10		1.00	0.22		1.00	0.41		0.19
Lane Grp Cap(c), veh/h	1006	0	801	983	0	801	637	0	488	601	0	0
V/C Ratio(X)	0.55	0.00	0.04	0.35	0.00	0.06	0.13	0.00	0.08	0.44	0.00	0.00
Avail Cap(c_a), veh/h	1006	0	801	983	0	801	637	0	488	601	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.7	0.0	5.5	6.6	0.0	5.5	11.2	0.0	11.0	12.6	0.0	0.0
Incr Delay (d2), s/veh	2.2	0.0	0.1	1.0	0.0	0.1	0.4	0.0	0.3	2.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	0.0	0.2	2.7	0.0	0.3	0.8	0.0	0.4	3.0	0.0	0.0
LnGrp Delay(d),s/veh	9.9	0.0	5.6	7.6	0.0	5.7	11.6	0.0	11.3	14.9	0.0	0.0
LnGrp LOS	A		A	A		A	B		B	B		
Approach Vol, veh/h		586			387			121			262	
Approach Delay, s/veh		9.7			7.3			11.5			14.9	
Approach LOS		A			A			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		18.0		27.0		18.0		27.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		14.0		23.0		14.0		23.0				
Max Q Clear Time (g_c+I1), s		3.4		11.5		7.9		7.0				
Green Ext Time (p_c), s		1.6		4.8		1.1		5.8				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			10.2									
HCM 2010 LOS			B									



HCM 2010 Signalized Intersection Summary  
4: A Street & W. 10th Street/Beede Way

Cumulative+Project PM Conditions

07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	207	4	275	17	5	7	183	243	19	1	275	85
Future Volume (veh/h)	207	4	275	17	5	7	183	243	19	1	275	85
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1900	1845	1900	1845	1845	1900	1900	1845	1900
Adj Flow Rate, veh/h	225	4	0	18	5	8	199	264	21	1	299	92
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	509	535	0	80	22	35	422	1678	133	36	598	180
Arrive On Green	0.29	0.29	0.00	0.08	0.08	0.08	0.24	0.51	0.51	0.23	0.23	0.23
Sat Flow, veh/h	1757	1845	0	997	277	443	1757	3291	260	1	2601	782
Grp Volume(v), veh/h	225	4	0	31	0	0	199	140	145	211	0	181
Grp Sat Flow(s),veh/h/ln	1757	1845	0	1717	0	0	1757	1752	1799	1844	0	1541
Q Serve(g_s), s	10.4	0.2	0.0	1.7	0.0	0.0	9.7	4.2	4.3	0.0	0.0	10.3
Cycle Q Clear(g_c), s	10.4	0.2	0.0	1.7	0.0	0.0	9.7	4.2	4.3	9.9	0.0	10.3
Prop In Lane	1.00		0.00	0.58		0.26	1.00		0.14	0.00		0.51
Lane Grp Cap(c), veh/h	509	535	0	137	0	0	422	894	917	460	0	354
V/C Ratio(X)	0.44	0.01	0.00	0.23	0.00	0.00	0.47	0.16	0.16	0.46	0.00	0.51
Avail Cap(c_a), veh/h	509	535	0	137	0	0	422	894	917	460	0	354
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.9	25.3	0.0	43.1	0.0	0.0	32.6	13.0	13.1	33.5	0.0	33.6
Incr Delay (d2), s/veh	2.8	0.0	0.0	3.8	0.0	0.0	3.8	0.4	0.4	3.3	0.0	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	0.1	0.0	0.9	0.0	0.0	5.1	2.2	2.2	5.5	0.0	4.9
LnGrp Delay(d),s/veh	31.7	25.3	0.0	46.9	0.0	0.0	36.3	13.4	13.4	36.7	0.0	38.8
LnGrp LOS	C	C		D			D	B	B	D		D
Approach Vol, veh/h		229			31			484			392	
Approach Delay, s/veh		31.6			46.9			22.8			37.7	
Approach LOS		C			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		55.0		33.0	28.0	27.0		12.0				
Change Period (Y+Rc), s		4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s		51.0		29.0	24.0	23.0		8.0				
Max Q Clear Time (g_c+I1), s		6.3		12.4	11.7	12.3		3.7				
Green Ext Time (p_c), s		4.6		0.6	0.4	3.0		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				30.4								
HCM 2010 LOS				C								

**Intersection**

Int Delay, s/veh 1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	11	19	0	39	2	467	32	36	522	0
Future Vol, veh/h	0	0	11	19	0	39	2	467	32	36	522	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	0	12	21	0	42	2	508	35	39	567	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	904	1193	284	891	1175	271	567	0	0	542	0	0
Stage 1	646	646	-	529	529	-	-	-	-	-	-	-
Stage 2	258	547	-	362	646	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	230	184	710	235	189	724	994	-	-	1016	-	0
Stage 1	424	463	-	499	523	-	-	-	-	-	-	0
Stage 2	721	513	-	626	463	-	-	-	-	-	-	0
Platoon blocked, %												
Mov Cap-1 Maneuver	207	173	710	221	178	724	994	-	-	1016	-	-
Mov Cap-2 Maneuver	207	173	-	221	178	-	-	-	-	-	-	-
Stage 1	423	437	-	498	521	-	-	-	-	-	-	-
Stage 2	677	511	-	581	437	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.2	15.2	0	0.7
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT
Capacity (veh/h)	994	-	-	710	415	1016	-
HCM Lane V/C Ratio	0.002	-	-	0.017	0.152	0.039	-
HCM Control Delay (s)	8.6	-	-	10.2	15.2	8.7	0.2
HCM Lane LOS	A	-	-	B	C	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	0.5	0.1	-

**Intersection**

Int Delay, s/veh 2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	57	65	225	209	10
Future Vol, veh/h	11	57	65	225	209	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	175	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	12	63	72	250	232	11





















Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	632	238	243 0
Stage 1	238	-	- -
Stage 2	394	-	- -
Critical Hdwy	6.43	6.23	4.13 -
Critical Hdwy Stg 1	5.43	-	- -
Critical Hdwy Stg 2	5.43	-	- -
Follow-up Hdwy	3.527	3.327	2.227 -
Pot Cap-1 Maneuver	443	798	1317 -
Stage 1	799	-	- -
Stage 2	679	-	- -
Platoon blocked, %			- -
Mov Cap-1 Maneuver	419	798	1317 -
Mov Cap-2 Maneuver	419	-	- -
Stage 1	799	-	- -
Stage 2	642	-	- -

Approach	EB	NB	SB
HCM Control Delay, s	10.8	1.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1317	-	696	-	-
HCM Lane V/C Ratio	0.055	-	0.109	-	-
HCM Control Delay (s)	7.9	-	10.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.4	-	-

HCM 2010 Signalized Intersection Summary  
 7: G Street & W. 18th Street
























Cumulative+Project PM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	374	37	102	357	88	17	98	84	99	203	107
Future Volume (veh/h)	51	374	37	102	357	88	17	98	84	99	203	107
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1900	1900	1845	1845	1900	1845	1845
Adj Flow Rate, veh/h	55	407	0	111	388	0	18	107	91	108	221	116
Adj No. of Lanes	1	1	0	1	1	0	0	1	1	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	146	584	0	176	615	0	44	261	261	89	183	235
Arrive On Green	0.08	0.32	0.00	0.10	0.33	0.00	0.17	0.17	0.17	0.15	0.15	0.15
Sat Flow, veh/h	1757	1845	0	1757	1845	0	264	1568	1568	596	1219	1568
Grp Volume(v), veh/h	55	407	0	111	388	0	125	0	91	329	0	116
Grp Sat Flow(s),veh/h/ln	1757	1845	0	1757	1845	0	1831	0	1568	1815	0	1568
Q Serve(g_s), s	1.8	11.6	0.0	3.6	10.7	0.0	3.7	0.0	3.1	9.0	0.0	4.1
Cycle Q Clear(g_c), s	1.8	11.6	0.0	3.6	10.7	0.0	3.7	0.0	3.1	9.0	0.0	4.1
Prop In Lane	1.00		0.00	1.00		0.00	0.14		1.00	0.33		1.00
Lane Grp Cap(c), veh/h	146	584	0	176	615	0	305	0	261	272	0	235
V/C Ratio(X)	0.38	0.70	0.00	0.63	0.63	0.00	0.41	0.00	0.35	1.21	0.00	0.49
Avail Cap(c_a), veh/h	146	584	0	176	615	0	305	0	261	272	0	235
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.0	18.0	0.0	25.9	16.9	0.0	22.4	0.0	22.1	25.5	0.0	23.4
Incr Delay (d2), s/veh	7.2	6.7	0.0	16.0	4.9	0.0	4.0	0.0	3.6	123.1	0.0	7.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	7.0	0.0	2.5	6.2	0.0	2.2	0.0	1.6	13.8	0.0	2.2
LnGrp Delay(d),s/veh	33.2	24.7	0.0	42.0	21.7	0.0	26.4	0.0	25.8	148.6	0.0	30.6
LnGrp LOS	C	C		D	C		C		C	F		C
Approach Vol, veh/h		462			499			216			445	
Approach Delay, s/veh		25.7			26.2			26.1			117.8	
Approach LOS		C			C			C			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		14.0	10.0	23.0		13.0	9.0	24.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		10.0	6.0	19.0		9.0	5.0	20.0				
Max Q Clear Time (g_c+I1), s		5.7	5.6	13.6		11.0	3.8	12.7				
Green Ext Time (p_c), s		0.3	0.0	2.3		0.0	0.0	2.9				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			51.2									
HCM 2010 LOS			D									

HCM Signalized Intersection Capacity Analysis  
8: A Street & W. 18th Street/E. 18th Street

Cumulative+Project PM Conditions

07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	250	53	335	193	147	91	453	295	168	481	18
Future Volume (vph)	91	250	53	335	193	147	91	453	295	168	481	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1796		1665	1728	1568	1752	3505	1568	1752	3485	
Flt Permitted	0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1796		1665	1728	1568	1752	3505	1568	1752	3485	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	272	58	364	210	160	99	492	321	183	523	20
RTOR Reduction (vph)	0	6	0	0	0	122	0	0	252	0	2	0
Lane Group Flow (vph)	99	324	0	280	294	38	99	492	69	183	541	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	35.0	35.0		32.0	32.0	32.0	13.0	29.0	29.0	23.0	39.0	
Effective Green, g (s)	35.0	35.0		32.0	32.0	32.0	13.0	29.0	29.0	23.0	39.0	
Actuated g/C Ratio	0.26	0.26		0.24	0.24	0.24	0.10	0.21	0.21	0.17	0.29	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	454	465		394	409	371	168	752	336	298	1006	
v/s Ratio Prot	0.06	c0.18		0.17	c0.17		0.06	c0.14		c0.10	0.16	
v/s Ratio Perm						0.02			0.04			
v/c Ratio	0.22	0.70		0.71	0.72	0.10	0.59	0.65	0.21	0.61	0.54	
Uniform Delay, d1	39.3	45.2		47.3	47.4	40.3	58.4	48.4	43.5	51.9	40.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	8.4		10.4	10.4	0.6	14.3	4.4	1.4	9.1	2.1	
Delay (s)	40.4	53.6		57.6	57.8	40.8	72.7	52.8	44.9	61.0	42.5	
Level of Service	D	D		E	E	D	E	D	D	E	D	
Approach Delay (s)		50.5			54.0			52.2			47.1	
Approach LOS		D			D			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay	51.1			HCM 2000 Level of Service				D				
HCM 2000 Volume to Capacity ratio	0.68											
Actuated Cycle Length (s)	135.0			Sum of lost time (s)				16.0				
Intersection Capacity Utilization	65.9%			ICU Level of Service				C				
Analysis Period (min)	15											

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 9: Service Road & Evergreen Avenue/Driveway & E. 18th Street

Cumulative+Project PM Conditions

07/12/2017



Movement	EBL	EBT	WBL2	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR2	NEL2
Lane Configurations												
Traffic Volume (vph)	41	630	29	630	11	11	3	37	22	3	31	2
Future Volume (vph)	41	630	29	630	11	11	3	37	22	3	31	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0			4.0			4.0		
Lane Util. Factor	1.00	0.95	1.00	0.95			1.00			1.00		
Frt	1.00	1.00	1.00	1.00			0.90			0.92		
Flt Protected	0.95	1.00	0.95	1.00			0.99			0.98		
Satd. Flow (prot)	1752	3505	1752	3496			1646			1673		
Flt Permitted	0.95	1.00	0.95	1.00			0.99			0.98		
Satd. Flow (perm)	1752	3505	1752	3496			1646			1673		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	685	32	685	12	12	3	40	24	3	34	2
RTOR Reduction (vph)	0	0	0	1	0	0	36	0	0	55	0	0
Lane Group Flow (vph)	45	685	32	696	0	0	19	0	0	6	0	0
Turn Type	Prot	NA	Prot	NA		Split	NA		Split	NA		Prot
Protected Phases	7	4	3	8		5	5		6	6		2
Permitted Phases												
Actuated Green, G (s)	10.0	39.0	7.0	36.0			9.0			10.0		
Effective Green, g (s)	10.0	39.0	7.0	36.0			9.0			10.0		
Actuated g/C Ratio	0.10	0.39	0.07	0.36			0.09			0.10		
Clearance Time (s)	4.0	4.0	4.0	4.0			4.0			4.0		
Vehicle Extension (s)	3.0	3.0	3.0	3.0			3.0			3.0		
Lane Grp Cap (vph)	175	1366	122	1258			148			167		
v/s Ratio Prot	c0.03	c0.20	0.02	c0.20			c0.01			c0.00		
v/s Ratio Perm												
v/c Ratio	0.26	0.50	0.26	0.55			0.13			0.04		
Uniform Delay, d1	41.6	23.1	44.1	25.6			41.9			40.6		
Progression Factor	1.00	1.00	1.00	1.00			1.00			1.00		
Incremental Delay, d2	3.5	1.3	5.2	1.8			1.7			0.4		
Delay (s)	45.1	24.4	49.2	27.3			43.6			41.1		
Level of Service	D	C	D	C			D			D		
Approach Delay (s)		25.7		28.3			43.6			41.1		
Approach LOS		C		C			D			D		

Intersection Summary

HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 9: Service Road & Evergreen Avenue/Driveway & E. 18th Street

Cumulative+Project PM Conditions





















07/12/2017



Movement	NEL	NER2
Lane Configurations		
Traffic Volume (vph)	0	10
Future Volume (vph)	0	10
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frt	0.89	
Flt Protected	0.99	
Satd. Flow (prot)	1621	
Flt Permitted	0.99	
Satd. Flow (perm)	1621	
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	0	11
RTOR Reduction (vph)	11	0
Lane Group Flow (vph)	2	0
Turn Type	Prot	
Protected Phases	2	
Permitted Phases		
Actuated Green, G (s)	15.0	
Effective Green, g (s)	15.0	
Actuated g/C Ratio	0.15	
Clearance Time (s)	4.0	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	243	
v/s Ratio Prot	c0.00	
v/s Ratio Perm		
v/c Ratio	0.01	
Uniform Delay, d1	36.2	
Progression Factor	1.00	
Incremental Delay, d2	0.1	
Delay (s)	36.2	
Level of Service	D	
Approach Delay (s)	36.2	
Approach LOS	D	
<b>Intersection Summary</b>		

HCM 2010 Signalized Intersection Summary  
 10: Cavallo Road & E. 18th Street

Cumulative+Project PM Conditions  
 07/12/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	158	406	80	41	415	132	65	76	44	120	109	197
Future Volume (veh/h)	158	406	80	41	415	132	65	76	44	120	109	197
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1845	1900	1845	1845	1900	1845	1845	1900	1845	1845	1900
Adj Flow Rate, veh/h	172	441	87	45	451	143	71	83	48	130	118	214
Adj No. of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	351	1096	215	198	755	237	300	398	230	475	213	387
Arrive On Green	0.20	0.38	0.38	0.11	0.29	0.29	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1757	2923	573	1757	2626	826	1034	1098	635	1242	589	1068
Grp Volume(v), veh/h	172	263	265	45	300	294	71	0	131	130	0	332
Grp Sat Flow(s),veh/h/ln	1757	1752	1744	1757	1752	1699	1034	0	1733	1242	0	1656
Q Serve(g_s), s	6.9	8.8	9.0	1.9	11.8	11.9	4.7	0.0	4.2	6.5	0.0	12.8
Cycle Q Clear(g_c), s	6.9	8.8	9.0	1.9	11.8	11.9	17.5	0.0	4.2	10.6	0.0	12.8
Prop In Lane	1.00		0.33	1.00		0.49	1.00		0.37	1.00		0.64
Lane Grp Cap(c), veh/h	351	657	654	198	504	488	300	0	628	475	0	600
V/C Ratio(X)	0.49	0.40	0.41	0.23	0.60	0.60	0.24	0.00	0.21	0.27	0.00	0.55
Avail Cap(c_a), veh/h	351	657	654	198	504	488	300	0	628	475	0	600
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.4	18.4	18.4	32.3	24.5	24.6	27.3	0.0	17.6	21.2	0.0	20.3
Incr Delay (d2), s/veh	4.8	1.8	1.9	2.7	5.1	5.4	1.9	0.0	0.8	1.4	0.0	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	4.6	4.6	1.0	6.4	6.3	1.5	0.0	2.1	2.4	0.0	6.4
LnGrp Delay(d),s/veh	33.2	20.2	20.3	35.0	29.6	30.0	29.2	0.0	18.3	22.7	0.0	24.0
LnGrp LOS	C	C	C	C	C	C	C		B	C		C
Approach Vol, veh/h		700			639			202				462
Approach Delay, s/veh		23.4			30.2			22.1				23.6
Approach LOS		C			C			C				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		33.0	13.0	34.0		33.0	20.0	27.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		29.0	9.0	30.0		29.0	16.0	23.0				
Max Q Clear Time (g_c+I1), s		19.5	3.9	11.0		14.8	8.9	13.9				
Green Ext Time (p_c), s		2.6	0.0	7.0		3.3	0.2	4.5				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			25.5									
HCM 2010 LOS			C									



HCM Signalized Intersection Capacity Analysis  
 11: Hillcrest Avenue & E. 18th Street

Cumulative+Project PM Conditions

07/12/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	305	184	278	266	26	248	227	420	33	112	42
Future Volume (vph)	48	305	184	278	266	26	248	227	420	33	112	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3307		1752	3458		1665	1744	1568	1752	1845	1568
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1752	3307		1752	3458		1665	1744	1568	1752	1845	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	332	200	302	289	28	270	247	457	36	122	46
RTOR Reduction (vph)	0	78	0	0	6	0	0	0	330	0	0	40
Lane Group Flow (vph)	52	454	0	302	311	0	243	274	127	36	122	6
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases									2			6
Actuated Green, G (s)	6.0	24.0		27.0	45.0		32.0	32.0	32.0	16.0	16.0	16.0
Effective Green, g (s)	6.0	24.0		27.0	45.0		32.0	32.0	32.0	16.0	16.0	16.0
Actuated g/C Ratio	0.05	0.21		0.23	0.39		0.28	0.28	0.28	0.14	0.14	0.14
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	91	690		411	1353		463	485	436	243	256	218
v/s Ratio Prot	0.03	c0.14		c0.17	0.09		0.15	c0.16		0.02	c0.07	
v/s Ratio Perm									0.08			0.00
v/c Ratio	0.57	0.66		0.73	0.23		0.52	0.56	0.29	0.15	0.48	0.03
Uniform Delay, d1	53.2	41.7		40.7	23.4		35.1	35.5	32.6	43.5	45.6	42.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	23.5	4.9		11.1	0.4		4.2	4.7	1.7	1.3	6.2	0.2
Delay (s)	76.8	46.6		51.8	23.8		39.3	40.2	34.3	44.8	51.9	43.0
Level of Service	E	D		D	C		D	D	C	D	D	D
Approach Delay (s)		49.3			37.5			37.2			48.6	
Approach LOS		D			D			D			D	

Intersection Summary

HCM 2000 Control Delay	41.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
 10: Cavallo Road & County Driveway

Existing AM Conditions

05/11/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	82	282	242	12
Future Volume (Veh/h)	0	0	82	282	242	12
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	82	282	242	12
<b>Pedestrians</b>						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None	None		
Median storage (veh)						
Upstream signal (ft)			825	672		
pX, platoon unblocked						
vC, conflicting volume	694	248	254			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	694	248	254			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	94			
cM capacity (veh/h)	382	788	1305			
<b>Direction, Lane #</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>			
Volume Total	82	282	254			
Volume Left	82	0	0			
Volume Right	0	0	12			
cSH	1305	1700	1700			
Volume to Capacity	0.06	0.17	0.15			
Queue Length 95th (ft)	5	0	0			
Control Delay (s)	7.9	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	1.8	0.0				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			1.1			
Intersection Capacity Utilization			24.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 10: Cavallo Road & County Driveway

Existing PM Conditions  
 05/11/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	24	271	314	2
Future Volume (Veh/h)	0	0	24	271	314	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	24	271	314	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				825	672	
pX, platoon unblocked						
vC, conflicting volume	634	315	316			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	634	315	316			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	98			
cM capacity (veh/h)	433	723	1239			
<b>Direction, Lane #</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>			
Volume Total	24	271	316			
Volume Left	24	0	0			
Volume Right	0	0	2			
cSH	1239	1700	1700			
Volume to Capacity	0.02	0.16	0.19			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	8.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.6	0.0				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization			23.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 10: Cavallo Road & County Driveway

Existing+Project AM Conditions  
 05/11/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	270	470	400	138
Future Volume (Veh/h)	0	0	270	470	400	138
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	270	470	400	138
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				825	672	
pX, platoon unblocked						
vC, conflicting volume	1479	469	538			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1479	469	538			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	74			
cM capacity (veh/h)	101	592	1025			
<b>Direction, Lane #</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>			
Volume Total	270	470	538			
Volume Left	270	0	0			
Volume Right	0	0	138			
cSH	1025	1700	1700			
Volume to Capacity	0.26	0.28	0.32			
Queue Length 95th (ft)	27	0	0			
Control Delay (s)	9.8	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	3.6	0.0				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			2.1			
Intersection Capacity Utilization			51.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 10: Cavallo Road & County Driveway

Existing+Project PM Conditions

05/11/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	101	348	426	53
Future Volume (Veh/h)	0	0	101	348	426	53
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	101	348	426	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				825	672	
pX, platoon unblocked						
vC, conflicting volume	1002	452	479			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1002	452	479			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	91			
cM capacity (veh/h)	242	605	1078			
<b>Direction, Lane #</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>			
Volume Total	101	348	479			
Volume Left	101	0	0			
Volume Right	0	0	53			
cSH	1078	1700	1700			
Volume to Capacity	0.09	0.20	0.28			
Queue Length 95th (ft)	8	0	0			
Control Delay (s)	8.7	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	2.0		0.0			
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			0.9			
Intersection Capacity Utilization			37.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 10: Cavallo Road & County Driveway

Cumulative AM Conditions  
 05/11/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	82	285	245	12
Future Volume (Veh/h)	0	0	82	285	245	12
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	82	285	245	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type						
				None	None	
Median storage (veh)						
Upstream signal (ft)						
				825	672	
pX, platoon unblocked						
vC, conflicting volume	700	251	257			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	700	251	257			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	94			
cM capacity (veh/h)	379	785	1302			
<b>Direction, Lane #</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>			
Volume Total	82	285	257			
Volume Left	82	0	0			
Volume Right	0	0	12			
cSH	1302	1700	1700			
Volume to Capacity	0.06	0.17	0.15			
Queue Length 95th (ft)	5	0	0			
Control Delay (s)	8.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	1.8		0.0			
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			1.0			
Intersection Capacity Utilization			24.8%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 10: Cavallo Road & County Driveway

Cumulative PM Conditions  
 05/11/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	24	289	314	2
Future Volume (Veh/h)	0	0	24	289	314	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	24	289	314	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				825	672	
pX, platoon unblocked						
vC, conflicting volume	652	315	316			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	652	315	316			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	98			
cM capacity (veh/h)	423	723	1239			
<b>Direction, Lane #</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>			
Volume Total	24	289	316			
Volume Left	24	0	0			
Volume Right	0	0	2			
cSH	1239	1700	1700			
Volume to Capacity	0.02	0.17	0.19			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	8.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.6		0.0			
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			0.3			
Intersection Capacity Utilization			23.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 10: Cavallo Road & County Driveway

Cumulative+Project AM Conditions  
 05/11/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	270	473	403	138
Future Volume (Veh/h)	0	0	270	473	403	138
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	270	473	403	138
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				825	672	
pX, platoon unblocked						
vC, conflicting volume	1485	472	541			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1485	472	541			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	74			
cM capacity (veh/h)	100	590	1023			
<b>Direction, Lane #</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>			
Volume Total	270	473	541			
Volume Left	270	0	0			
Volume Right	0	0	138			
cSH	1023	1700	1700			
Volume to Capacity	0.26	0.28	0.32			
Queue Length 95th (ft)	27	0	0			
Control Delay (s)	9.8	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	3.6		0.0			
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			2.1			
Intersection Capacity Utilization			51.2%	ICU Level of Service	A	
Analysis Period (min)			15			



HCM Unsignalized Intersection Capacity Analysis  
 10: Cavallo Road & County Driveway

Cumulative+Project PM Conditions  
 05/11/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	101	366	426	53
Future Volume (Veh/h)	0	0	101	366	426	53
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	101	366	426	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				825	672	
pX, platoon unblocked						
vC, conflicting volume	1020	452	479			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1020	452	479			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	91			
cM capacity (veh/h)	236	605	1078			
<b>Direction, Lane #</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>			
Volume Total	101	366	479			
Volume Left	101	0	0			
Volume Right	0	0	53			
cSH	1078	1700	1700			
Volume to Capacity	0.09	0.22	0.28			
Queue Length 95th (ft)	8	0	0			
Control Delay (s)	8.7	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	1.9		0.0			
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			0.9			
Intersection Capacity Utilization			37.9%	ICU Level of Service	A	
Analysis Period (min)			15			



August 1, 2017

Mr. Gant Bowman  
Real Estate Project Manager  
Rocketship Education  
350 Twin Dolphin Drive, Suite 109  
Redwood City, CA 94065

**Re: Response to Peer-Review Comments on the Traffic Study Prepared for the Proposed Rocketship School at 1700 Cavallo Road in Antioch, California**

Dear Mr. Bowman,

This letter provides our responses to the peer-review comments provided by Kimley-Horn and Associates, Inc. (Kimley-Horn), dated July 31, 2017 on the draft traffic study prepared for the proposed new elementary school at 1700 Cavallo Road in Antioch, California.

1. **Comment:** In review of the Synchro outputs in the Appendix, it appears that a factor of 0.92 was not used for all intersections. The following is a list of PHF by intersection:
  - Int #1 – PHF = 0.90 in the AM peak hour and 0.92 in the PM peak hour
  - Int #2 – PHF = 0.90 in the AM peak hour and 0.90 in the PM peak hour
  - Int #3 – PHF = 0.95 in the AM peak hour and 0.92 in the PM peak hour
  - Int #4 – PHF = 0.92 in the AM peak hour and 0.92 in the PM peak hour
  - Int #5 – PHF = 0.92 in the AM peak hour and 0.92 in the PM peak hour
  - Int #6 – PHF = 0.90 in the AM peak hour and 0.90 in the PM peak hour
  - Int #7 – PHF = 0.92 in the AM peak hour and 0.92 in the PM peak hour
  - Int #8 – PHF = 0.92 in the AM peak hour and 0.92 in the PM peak hour
  - Int #9 – PHF = 0.92 in the AM peak hour and 0.92 in the PM peak hour
  - Int #10 – PHF = 0.92 in the AM peak hour and 0.92 in the PM peak hour
  - Int #11 – PHF = 0.92 in the AM peak hour and 0.92 in the PM peak hour

Please confirm.

**Response:** The peak hour factors listed in this comment are correct. A factor of 0.92 or 0.90 was applied at each intersection in accordance with the CCTA Technical Procedures depending on the volumes. For the “G” Street intersections (10<sup>th</sup> Street and 18<sup>th</sup> Street), where the traffic volumes were obtained from the Antioch High School Traffic Study, that study’s respective peak hour factors were used to maintain consistency.

2. **Comment:** Figure 5 shows one EB through lane and one shared through-right turn lane. It is missing the EB left turn lane. Please update.

**Response:** The existing lane configuration figure (Figure 5) has been modified to reflect the inclusion of an eastbound left-turn lane.

3. **Comment:** The text, on page 34, describing the queues for the intersection of “A” Street and West 10 Street/Beede Way was not updated to reflect the updated storage length of



Mr. Gant Bowman  
August 1, 2017  
Page 2 of 2

190 feet. It still mentions that the queue exceeds the storage by 25 feet, but with the updated 190 feet storage, the queue exceeds the storage by 60 feet in the Existing and Cumulative AM scenarios and by 10 feet in the Existing and Cumulative PM scenarios. Please update.

**Response:** The updated report includes a revised queuing analysis description for the "A" Street and West 10th Street/Beede Way intersection that says the project would increase the 95<sup>th</sup> percentile peak hour queues by one vehicle; however, the small increase in queue length would have a negligible effect on traffic operations at this intersection, thus no improvements are recommended.

Please do not hesitate to contact us if there are any further questions regarding the Rocketship Traffic Study.

Sincerely,  
**HEXAGON TRANSPORTATION CONSULTANTS, INC.**

A handwritten signature in black ink that reads "Michelle Hunt".

Michelle Hunt  
Vice President