Transportation Impact Study

Downtown Library and Affordable Housing Project
Santa Cruz, California

January 31, 2023

Prepared for:

City of Santa Cruz

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EXECUTIVE SUMMARY

This report documents the results of a transportation impact study completed for the Santa Cruz Library project (the "proposed project", or "project"). The project proposes to construct a 38,086 square-foot library, a parking garage containing up to 400 spaces, 9,598 square-feet of commercial uses, a 1,905 square-foot day care, and 124 low-income residential dwelling units on the lot that includes one building located at 119 Lincoln Street and also City Parking Lot 4 at 600-698 Cedar Street in Santa Cruz, California. Access to the project site will be provided via one (1) proposed connection to an existing roadway, Cathcart Street.

This study was performed in accordance with the scope of work approved by the City of Santa Cruz, and in a manner consistent with the City of Santa Cruz's *Transportation Study Requirements for Development*. The following transportation facilities were included in this evaluation:

Intersections:

1. Front Street @ Soquel Avenue
2. Front Street @ Cathcart Street
3. Cathcart Street @ Pacific Avenue
4. Cathcart Street @ Cedar Street
5. Cathcart Street @ Project Driveway (plus Project scenarios only)

Based on the City's requirements, this transportation study was conducted for the study facilities for No Project under an Existing (2022) scenario and Plus Project conditions under Existing (2022) and Cumulative (2030) scenarios.

Significant findings of this study include:

- The proposed project is estimated to generate 2,144 new daily trips with 82 new trips occurring during the AM peak-hour and 269 new trips occurring during the PM peak-hour.
- As defined by the City, the addition of the proposed project to the Existing (2022) and Cumulative (2030) scenarios does not result in any of the study facilities operating below acceptable City LOS thresholds.
- Except for the northbound right movement at the Soquel Avenue intersection with Front Street (Intersection #1) and the eastbound right movement at the Cathcart intersection with Front Street (Intersection #2), the project does not cause any queue lengths to exceed the available storage or increase queue lengths that are deficient without the addition of the project. The northbound right movement at Intersection #1 is shared with the second through lane (shared through-right) and so the through trips affect the queue length at this intersection. As there is significant storage for the approach as a whole (one lane into two at the intersection) it is not anticipated that any safety issues will arise with this increased queue length. For the eastbound right movement at Intersection #2, while the 95th percentile queue exceeds the available storage, the average queue length is only 14-feet. In addition, the project only adds 4 trips per hour at this movement or one vehicle every 15 minutes. Therefore, no safety issues are anticipated at this intersection either due to the identified queue length with the addition of the project.

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INTRODUCTION

This report documents the results of a transportation impact study completed for the Santa Cruz Library project (the "proposed project", or "project"). The project proposes to construct a 38,086 square-foot library, a parking garage containing up to 400 spaces, 9,598 square-feet of commercial uses, a 1,905 square-foot day care, and 124 low-income residential dwelling units on the lot that includes one building located at 119 Lincoln Street and also City Parking Lot 4 at 600-698 Cedar Street in Santa Cruz, California. Access to the project site will be provided via one proposed connection to an existing roadway, Cathcart Street.

This study was performed in accordance with the scope of work approved by the City of Santa Cruz, and in a manner consistent with the City of Santa Cruz's *Transportation Study Requirements for Development*. The remaining sections of this report document the proposed project, analysis methodologies, deficiencies and improvements, and general study conclusions.

PROJECT DESCRIPTION

The project proposes to construct a 38,086 square-foot library, a parking garage containing up to 400 spaces, 9,598 square-feet of commercial uses, a 1,905 square-foot day care, and 124 low-income residential dwelling units on the lot that includes one building located at 119 Lincoln Street and also City Parking Lot 4 at 600-698 Cedar Street in Santa Cruz, California. Access to the project site will be provided via one proposed connection to an existing roadway, Cathcart Street. The project location is shown in **Figure 1** and the project site plan is shown in **Figure 2**. The following transportation facilities are included in this evaluation:

Intersections:

1. Front Street @ Soquel Avenue
2. Front Street @ Cathcart Street
3. Cathcart Street @ Pacific Avenue
4. Cathcart Street @ Cedar Street
5. Cathcart Street @ Project Driveway

Based on the City's requirements, this transportation study was conducted for the study facilities for No Project under an Existing (2022) scenario and Plus Project conditions under Existing (2022) and Cumulative (2030) scenarios.

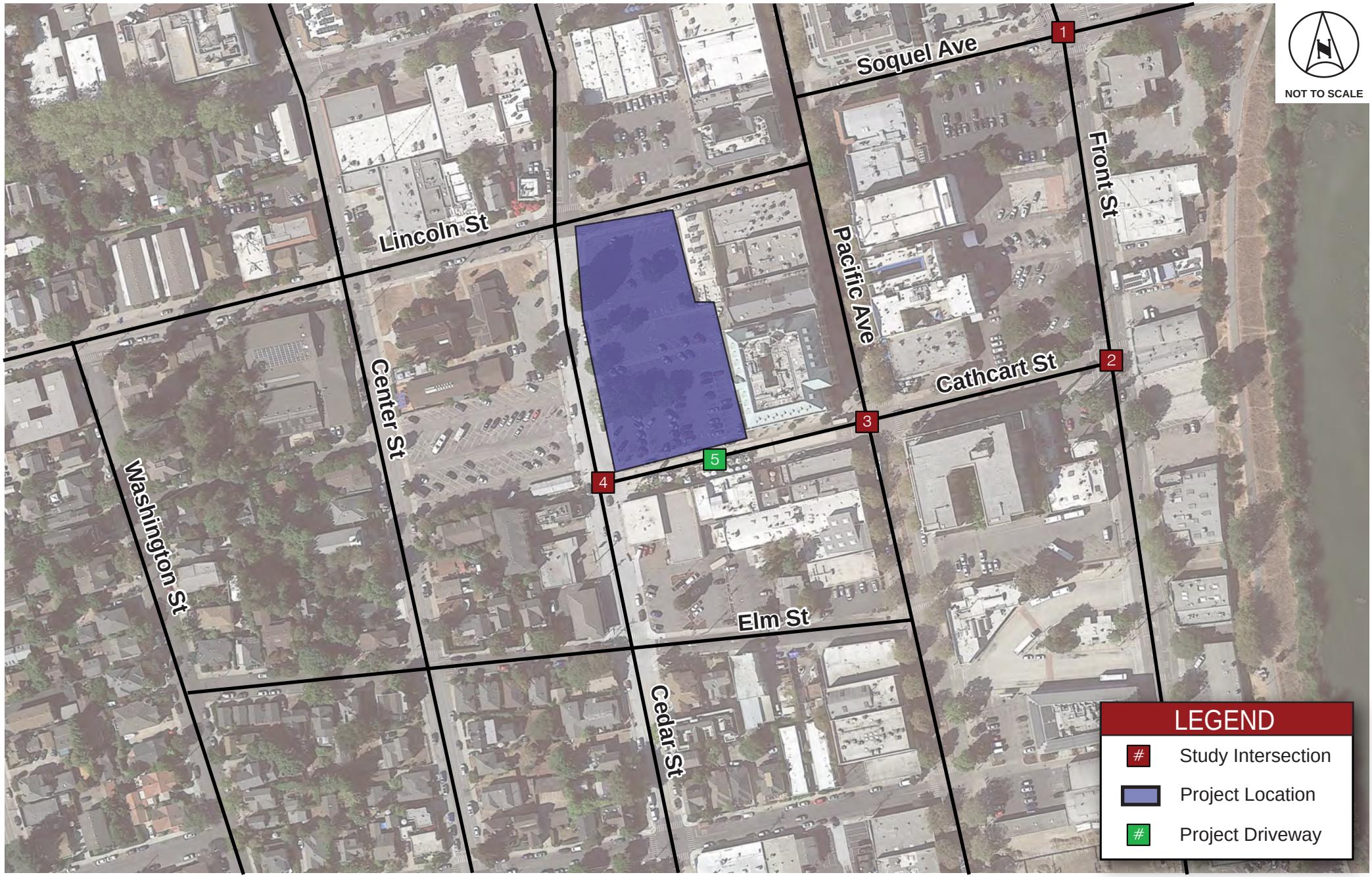

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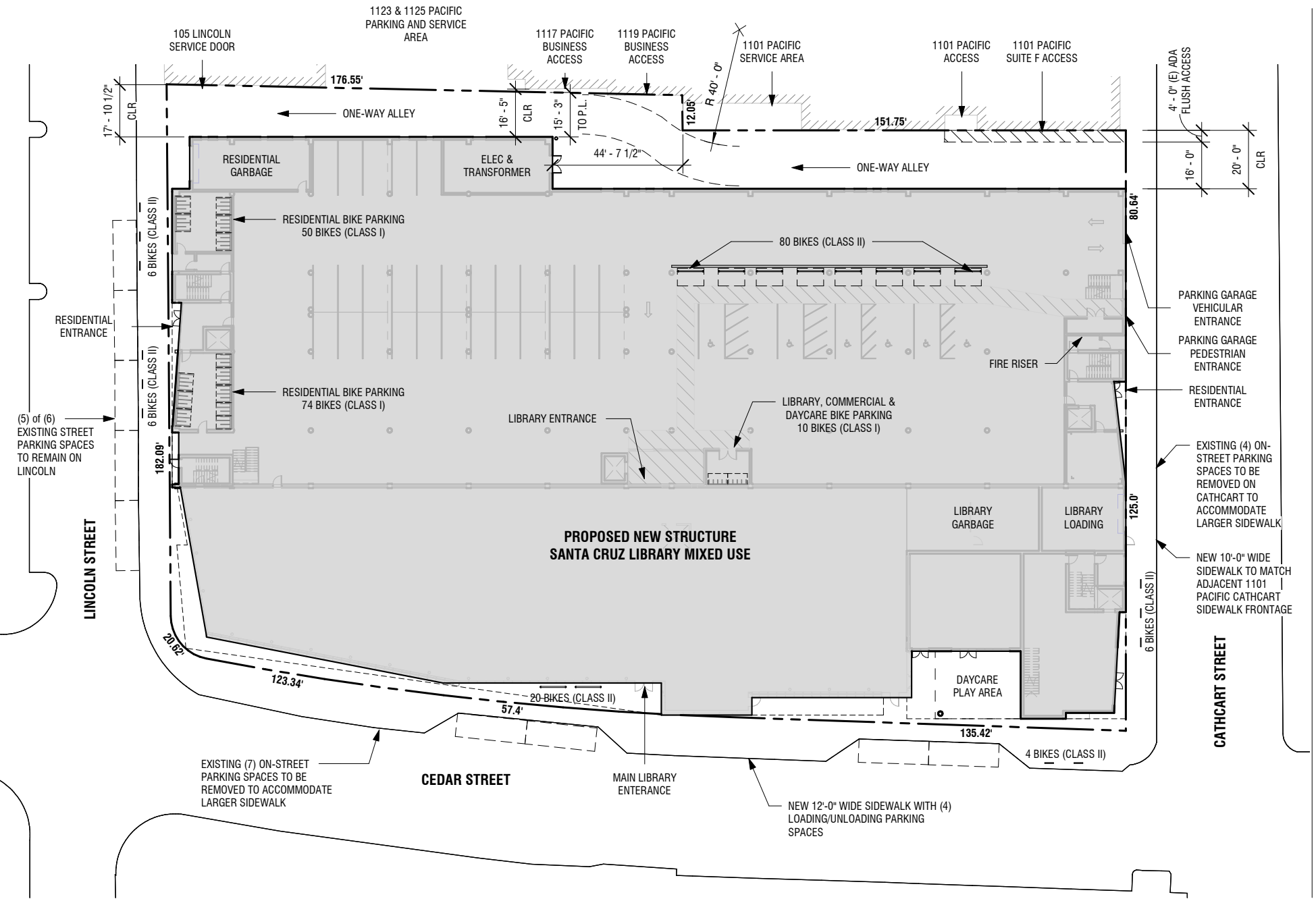
Figure 1
Project Vicinity Map



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08/16/2022

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Figure 2
Project Site Plan

PROJECT AREA ROADWAYS

The following are descriptions of the primary roadways in the vicinity of the project:

Soquel Avenue is an east-west principal arterial roadway that provides a primary connection between the east and west sides of Santa Cruz. The four-lane roadway carries approximately 15,300 vehicles per day[1] (vpd) between Pacific Avenue and Water Street in the vicinity of the proposed project location.

Front Street is a north-south minor arterial roadway that provides a primary connection from the project street (Cathcart Street) to Soquel Avenue. Between Laurel Street and River Street, Front Street carries approximately 13,800 vpd[1] with two through lanes in the Southbound direction and one through lane in the Northbound direction.

Cedar Street is a two-lane north-south collector roadway that runs from Center Street and ends at Sycamore Street. Cedar Street carries approximately 6,600 vpd[1] between Laurel Street and Lincoln Street.

Pacific Avenue is a two-lane north-south collector roadway that runs from Beach Street and ends at Water Street. Pacific Avenue is a one-way street between Cathcart Street and Church Street. Pacific Avenue carries approximately 3,400 vpd[1] between Laurel Street and Water Street.

ASSESSMENT OF PROPOSED PROJECT

Proposed Project Trip Generation and Assignment

The number of trips anticipated to be generated by the proposed project was approximated using data included in the *ITE Trip Generation Manual, 11th Edition*. The proposed project trip generation for the weekday AM and PM peak-hours is presented in **Table 1**. As shown in **Table 1**, the proposed project is estimated to generate 2,144 new daily trips with 82 new trips occurring during the AM peak-hour and 269 new trips occurring during the PM peak-hour.

As seen in **Table 1**, trips associated with the existing gym (Health/Fitness Club, ITE Land Use 492) were removed from the Net External Project Trips as directed by City of Santa Cruz staff. This is due to the proposed project replacing this existing gym when it is constructed. Therefore, these trips are already on the network and were included as part of the traffic counts collected.

Table 1 – Proposed Project Trip Generation

Land Use (ITE Code)	# Unit(s) / ksf	Daily Trips	AM Peak-Hour					PM Peak-Hour				
			Total Trips	IN		OUT		Total Trips	IN		OUT	
				%	Trips	%	Trips		%	Trips	%	Trips
Library (590)	38.1	2,653	52	71%	37	29%	15	338	48%	162	52%	176
Day Care Center (565)	1.9	91	21	52%	11	48%	10	21	48%	10	52%	11
Strip Retail Plaza (<40k) (822)	9.6	635	28	61%	17	39%	11	76	50%	38	50%	38
Multifamily Housing (Mid-Rise) (221)	124	545	43	23%	10	77%	33	49	61%	30	39%	19
Gross Project Trips		3,924	144	-	75	-	69	484	-	240	-	244
Reductions												
Health/Fitness Club (492)[1]	*5.3*	*-350*	*-7*	*23%*	*-4*	*49%*	*-3*	*-35*	*57%*	*-20*	*43%*	*-15*
40% Reduction for Downtown Area[2]		*-1,430*	*-55*	-	*-28*	-	*-27*	*-180*	-	*-88*	-	*-92*
Net External Project Trips:		2,144	82	-	43	-	39	269	-	132	-	137

Source: Trip Generation Manual, 11th Edition, ITE.

[1] Calculated under the basis that PM peak-hour represents 10% of daily trips. Daily trip generation numbers are not provided for this or similar Land Uses in ITE 11th Edition.

[2] 40% reduction for mixed use development in Downtown Santa Cruz per Santa Cruz Downtown Recovery Plan Amendment - Traffic Study, May 2017, Kimley-Horn and Associates. The reduction is generated by proximity to the Transit Center, mixed use internal capture, bicycle use, and walking trips. 40% reduction is applied to Project trips less existing fitness center trip reduction.

[1] *Santa Cruz County Average Daily Traffic Counts*, Santa Cruz County Regional Transportation Commission, 2015

Project traffic was distributed and assigned to the roadway network using a combination of existing traffic conditions and engineering judgement. Trip distributions were reviewed by the City of Santa Cruz in the *Trip Generation and Distribution*[2] memo submitted to the City on September 12, 2022. The proposed project trip AM and PM distribution percentages are provided in **Figure 3**. **Figure 4** depicts the study intersections' facilities, existing traffic control, and existing lane configurations. The assignment of AM and PM peak-hour project trips is depicted in **Figure 5**.

[2] *Santa Cruz Library Trip Generation and Distribution*, Kimley-Horn, September 2022

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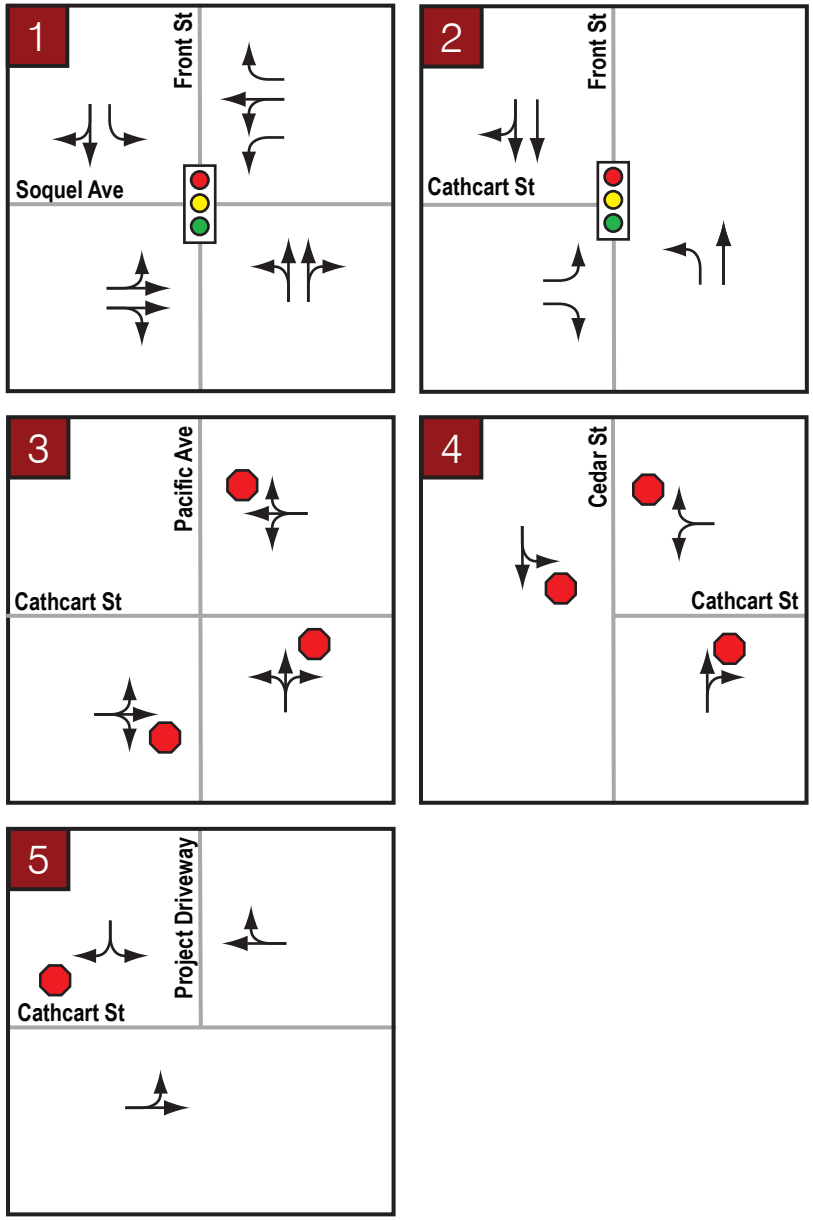
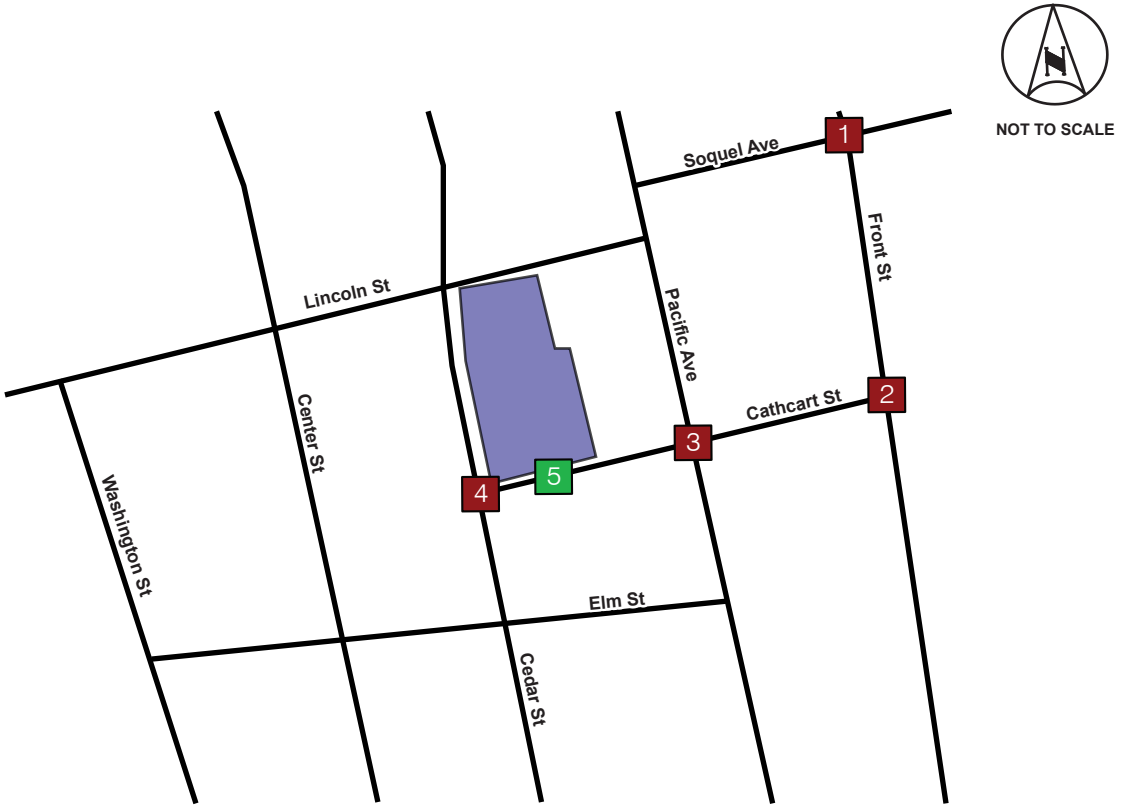
Figure 3
Project Trip Distribution





LEGEND

- # — Study Intersection
- # — Study Intersection (Project Driveway)
- Signalized Control
- Stop Control

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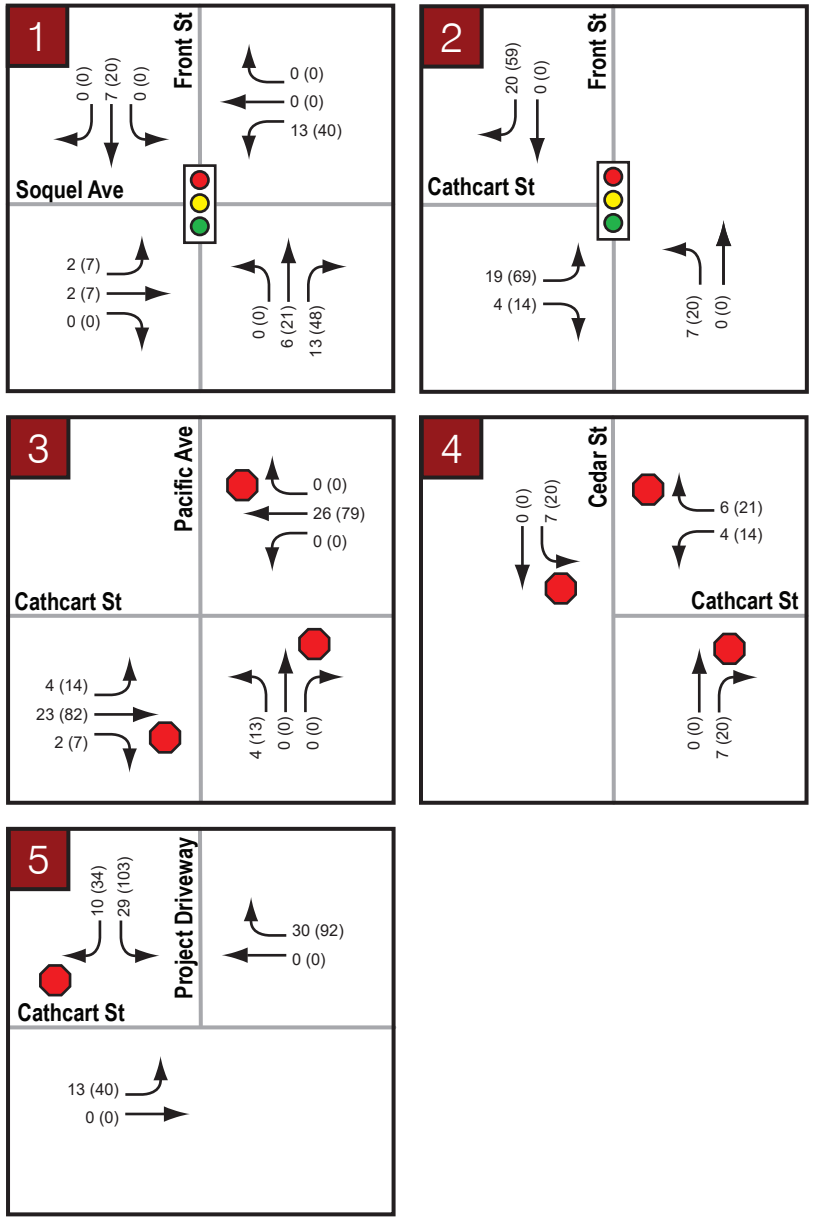
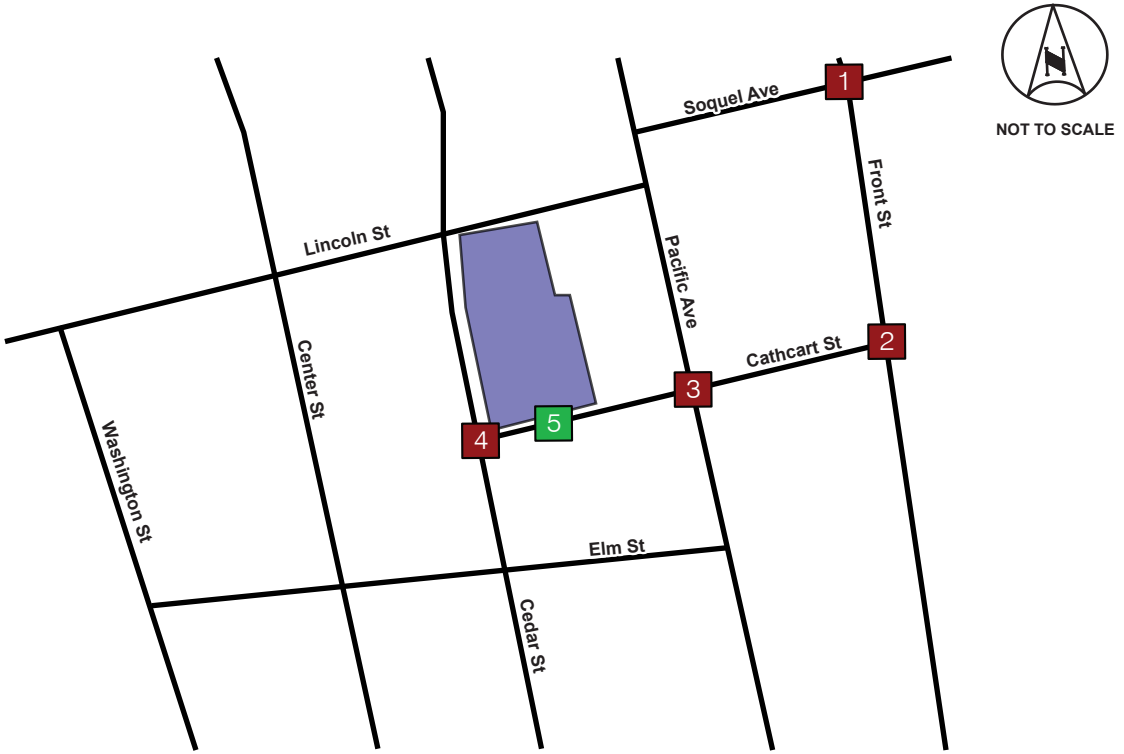
Figure 4
Study Facilities with Lane Geometry





LEGEND

- Project Location
- # — Study Intersection
- # — Study Intersection (Project Driveway)
- Signalized Control
- Stop Control
- XX (XX) — AM (PM) Peak-Hour Volumes

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Figure 5
Study Facilities with Project Trip Assignments

TRANSPORTATION STUDY METHODOLOGY

This transportation study was performed in accordance with the City's transportation study guidelines[3].

Level of Service Definitions

The level of service (LOS) of a facility is a qualitative measure used to describe operational conditions. LOS ranges from A, which represents minimal delay, to F, which represents heavy delay and a facility that is operating at or near its functional capacity. LOS for this study was determined using methods defined in the *Highway Capacity Manual (HCM) 6th Edition ("HCM6")*.

Intersection Analysis

The HCM includes procedures for analyzing side-street stop controlled (SSSC), all-way stop controlled (AWSC), and signalized intersections. The SSSC procedure defines LOS as a function of average control delay for each minor street approach movement. Conversely, the AWSC and signalized intersection procedures define LOS as a function of average control delay for the intersection. **Table 2** presents intersection LOS definitions as defined in the HCM.

Table 2 – Intersection Level of Service Criteria

Level of Service (LOS)	Un-Signalized	Signalized
	Average Control Delay* (sec/veh)	Average Control Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 – 15	> 10 – 20
C	> 15 – 25	> 20 – 35
D	> 25 – 35	> 35 – 55
E	> 35 – 50	> 55 – 80
F	> 50	> 80

Source: Highway Capacity Manual, 6th Edition
* Applied to the worst lane/lane group(s) for SSSC

LOS for the study intersections was determined using the Synchro® traffic analysis software. Synchro 11 uses HCM6 methodology to analyze intersection delay and LOS.

Analysis Scenarios

As described in the following sections, the LOS analysis was conducted for the study facilities for the following scenarios: Existing (2022) Conditions, Existing (2022) plus Proposed Project Conditions, and Cumulative (2030) plus Proposed Project Conditions.

[3] *City of Santa Cruz Transportation Study Requirements for Development*, City of Santa Cruz, 2021

EXISTING (2022) CONDITIONS

Existing traffic counts were collected to establish the existing conditions of the study area intersections. Counts were performed in September 2022 between 7-9 AM and 4-6 PM during typical weekdays (Tuesday-Thursday) with a particular emphasis on capturing conditions during normal peak periods.

Traffic counts from December 2017 at Intersection #1 (Front Street and Soquel Avenue) and Intersection #2 (Front Street and Cathcart Street) were compared against counts taken at both intersections in September 2022. As the December 2017 counts were higher at both intersections, the difference in intersection volumes between 2017 and 2022 was used to develop a factor and "grow" the 2022 counts taken at Intersection #3 (Cathcart Street and Pacific Avenue) and Intersection #4 (Cathcart Street and Cedar Street). Traffic counts used in the Existing (2022) conditions for the analysis are December 2017 volumes at Intersection #1 and #2 and factored September 2022 volumes at Intersection #3 and #4.

It is important to note that Cathcart Street between Cedar Street and Pacific Avenue is currently operating as a one-way road with only westbound traffic. This is due to the closure of the eastbound lane for outdoor dining. As reopening of the eastbound lane is expected once the project is constructed, counts in the westbound direction at both Intersection #3 and #4 were estimated using engineering judgement and existing traffic flow patterns at proximate intersections.

Existing (2022) Conditions AM and PM peak-hour traffic volumes are presented in **Figure 6**. 2017 and 2022 traffic count data sheets, along with calculations showing intersection growth rate calculation, are provided in **Appendix A**. Analysis worksheets for the scenario are included in **Appendix B**.

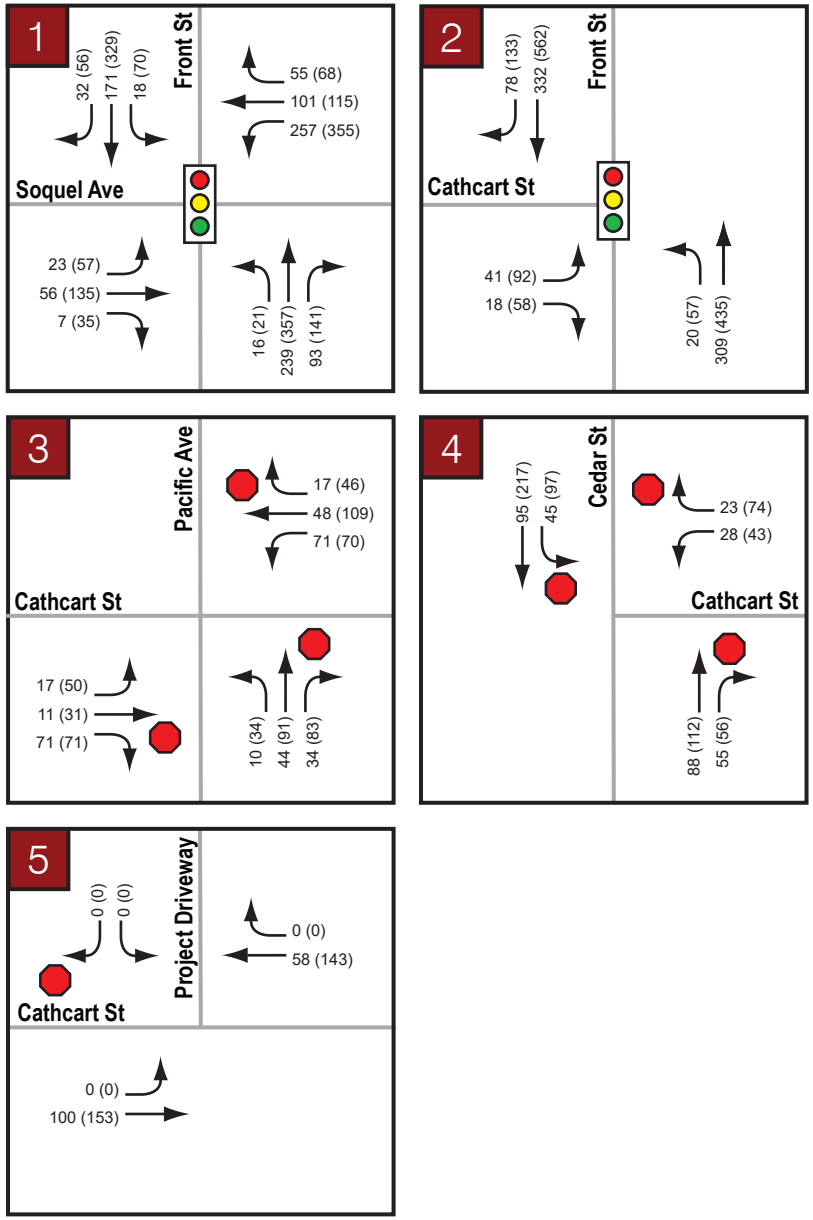
Intersections

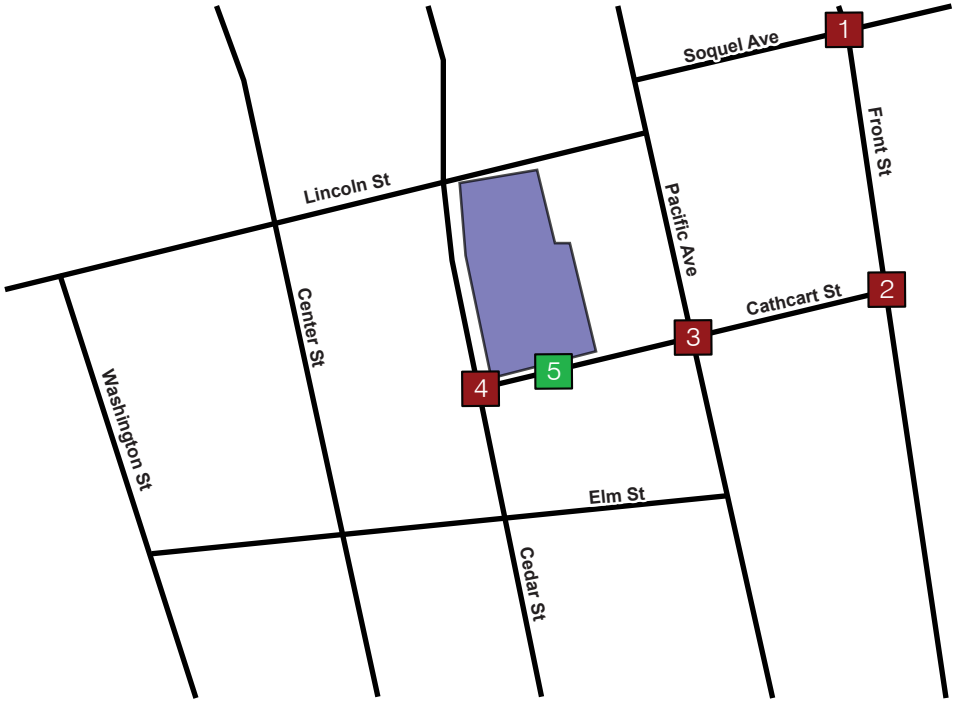
Table 3 presents the intersection operating conditions for this scenario. As indicated in **Table 3**, the study intersections operate between LOS A and LOS C during the AM and PM peak-hours.

Table 3 – Existing (2022) Intersection Levels of Service

ID	Intersection	LOS Threshold	Control	Peak Hour	Existing	
					Delay (sec)	LOS
1	Front Street @ Soquel Avenue	D	Signal	AM	32.6	C
				PM	24.7	C
2	Front Street @ Cathcart Street	D	Signal	AM	8.6	A
				PM	16.5	B
3	Cathcart Street @ Pacific Avenue	D	AWSC	AM	9.7	A
				PM	10.3	B
4	Cathcart Street @ Cedar Street	D	AWSC	AM	8.2	A
				PM	10.1	B
5	Cathcart Street @ Project Driveway	D	SSSC	AM	Not completed for scenario	
				PM		

Notes: Bold represents unacceptable operations.
Side Street Stop Controlled (SSSC) reported as intersection delay followed by worst approach's delay.





NOT TO SCALE

LEGEND

- Project Location
- # Study Intersection
- # Study Intersection (Project Driveway)
- Signalized Control
- Stop Control
- XX (XX) AM (PM) Peak-Hour Volumes

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Figure 6
Study Facilities with Existing Turning Movement Volumes

EXISTING (2022) PLUS PROPOSED PROJECT CONDITIONS

As previously discussed, the number of trips anticipated to be generated by the proposed project was derived using data included in the *ITE Trip Generation Manual, 11th Edition*. These trips were then assigned to the roadway network using engineering judgement and existing roadway volume patterns. Using these volumes, LOS was determined at the study facilities. Existing (2022) plus Proposed Project peak-hour traffic volumes are presented in **Figure 7** for the AM and PM peak-hours. Analysis worksheets for the scenario are included in **Appendix C**.

Intersections

Table 4 presents the intersection operating conditions for this analysis scenario. As indicated in **Table 4**, the study intersections operate between LOS A and LOS D during the AM and PM peak-hours.

Table 4 – Existing (2022) plus Proposed Project Intersection Levels of Service

ID	Intersection	LOS Threshold	Control	Peak Hour	Existing		Existing plus Proposed Project	
					Delay (sec)	LOS	Delay (sec)	LOS
1	Front Street @ Soquel Avenue	D	Signal	AM	32.6	C	32.8	C
				PM	24.7	C	37.4	D
2	Front Street @ Cathcart Street	D	Signal	AM	8.6	A	9.5	A
				PM	16.5	B	14.7	B
3	Cathcart Street @ Pacific Avenue	D	AWSC	AM	9.7	A	11.7	B
				PM	10.3	B	16.0	C
4	Cathcart Street @ Cedar Street	D	AWSC	AM	8.2	A	8.4	A
				PM	10.1	B	10.9	B
5	Cathcart Street @ Project Driveway	D	SSSC	AM	Not completed for scenario		1.9 (9.9 SB)	A
				PM			3.6 (14.0 SB)	B

Notes: Bold represents unacceptable operations. Shaded represents a project induced deficiency.
Side Street Stop Controlled (SSSC) reported as intersection delay followed by worst approach's delay.

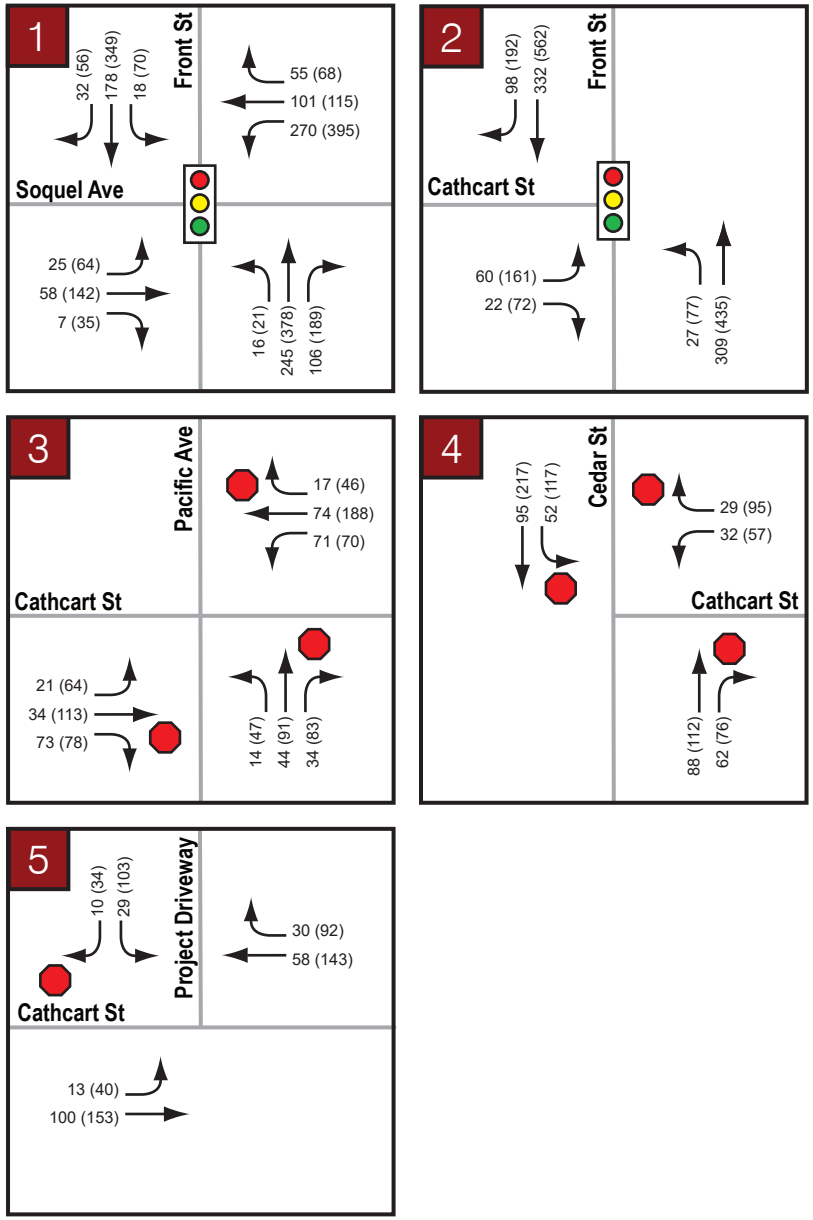

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Figure 7

Study Facilities with Existing Plus Project Turning Movement Volumes

CUMULATIVE (2030) PLUS PROPOSED PROJECT CONDITIONS

Peak-hour traffic volumes for Cumulative conditions were obtained from the City of Santa Cruz 2030 General Plan and include the growth anticipated by the University of Santa Cruz[4]. The volumes provided by the City, which can be found in **Appendix E**, were available for the two Front Street intersections with Soquel Avenue and Cathcart Street (Intersection #1 and Intersection #2). The volumes for the remaining Cathcart Street intersections (Intersections #3 – #5) were developed using a mix of volume balancing from the Cathcart Street intersection with Front Street (Intersection #2) and interpolating the background growth from the Santa Cruz County Travel Demand Model (SCC TDM) between the model's base year (2019) and future year (2040) and adding it to the counts obtained for Existing Conditions. The project volumes for the PM peak-hour were then layered on top of the volumes for Cumulative conditions to obtaining intersection turning movement volumes for Cumulative plus Project Conditions.

Using the volumes developed for Cumulative plus Project conditions, LOS was determined at the study facilities. Cumulative (2030) plus Proposed Project peak-hour traffic volumes are presented in **Figure 8** for the AM and PM peak-hours. Detailed calculations are included in **Appendix D**.

Intersections

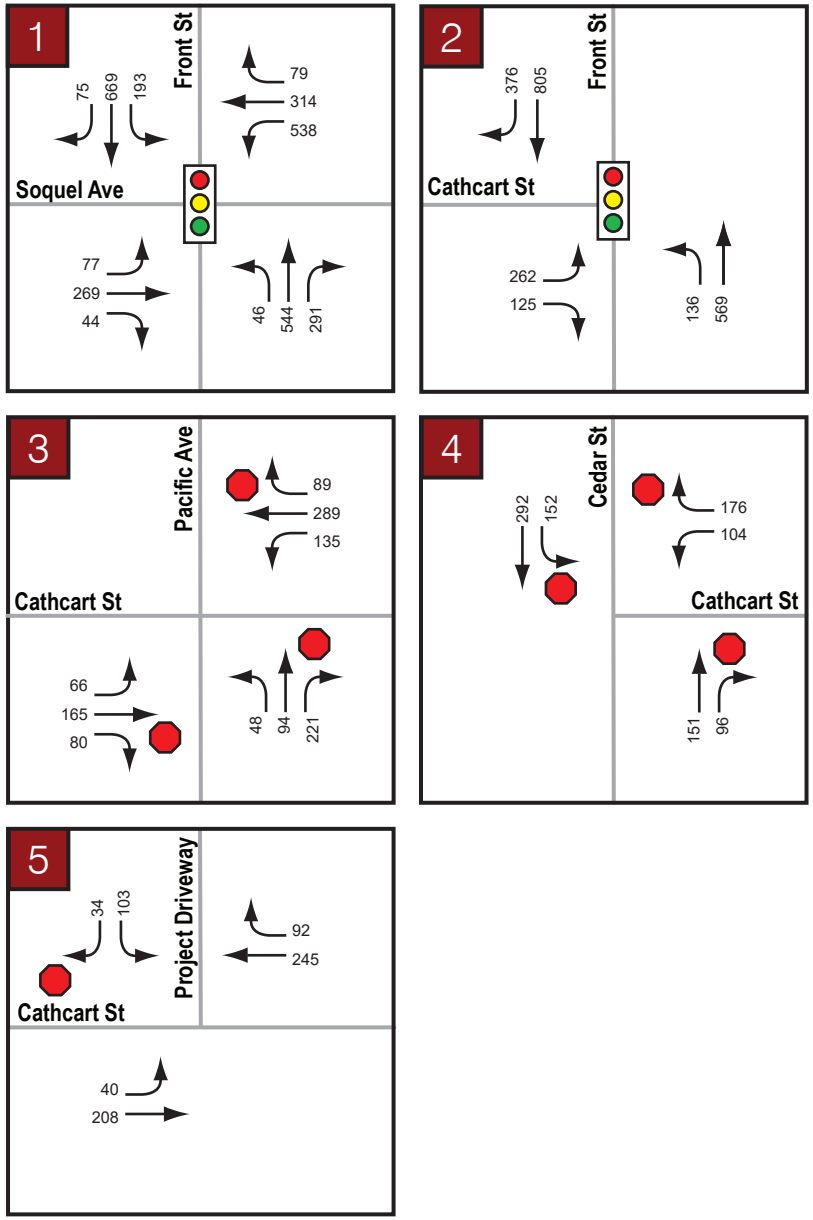
Table 5 presents the intersection operating conditions for this scenario. As indicated in **Table 5**, the study intersections operate between LOS A and LOS F. All intersections except the Front Street intersection with Soquel Avenue (Intersection #1) operate within the City's LOS threshold of LOS D.

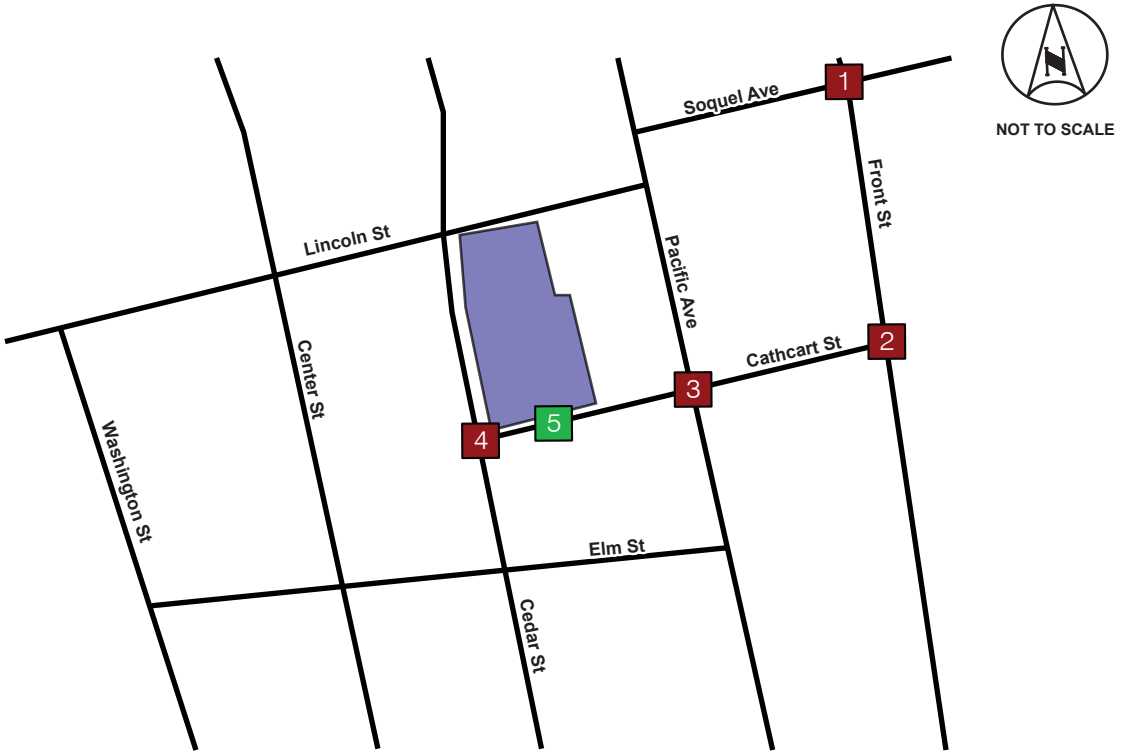
Table 5 – Cumulative (2030) plus Proposed Project Intersection Levels of Service

ID	Intersection	LOS Threshold	Control	Peak Hour	Existing plus Proposed Project		Cumulative plus Proposed Project	
					Delay (sec)	LOS	Delay (sec)	LOS
1	Front Street @ Soquel Avenue	D	Signal	PM	37.4	D	206.0	F
2	Front Street @ Cathcart Street	D	Signal	PM	14.7	B	25.6	C
3	Cathcart Street @ Pacific Avenue	D	AWSC	PM	16.0	C	27.0	D
4	Cathcart Street @ Cedar Street	D	AWSC	PM	10.9	B	16.2	C
5	Cathcart Street @ Project Driveway	D	SSSC	PM	3.6 (14.0 SB)	B	3.5 (15.9 SB)	B

Notes: Bold represents unacceptable operations.
Side Street Stop Controlled (SSSC) reported as intersection delay followed by worst approach's delay.

[4] *Transportation Study Requirements for Development – Cumulative Buildout Volumes City of Santa Cruz Critical Intersections*. City of Santa Cruz. August 6, 2021.





LEGEND

- Project Location
- # Study Intersection
- # Study Intersection (Project Driveway)
- Signalized Control
- Stop Control
- XX PM Peak-Hour Volumes

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Figure 8

Study Facilities with Cumulative Plus Project PM Peak-Hour Turning Movement Volumes

DEFICIENCIES AND IMPROVEMENTS

Standards of Deficiency

The City of Santa Cruz's *Transportation Study Requirements for Development*[3] was referenced to identify standards of deficiency at the study area intersections. The following criteria were used:

> *The project traffic added to existing conditions would result in the level of service deteriorating below the City standard and would be more than 3% over existing total volume at the studied intersection. The City's current level of service standard is LOS D.*
>
> *The project traffic together with General Plan buildout and update traffic would result in a drop below the level of service standard for the City of Santa Cruz. (This is defined as a cumulatively considerable effect irrespective of the proportional increase to traffic volumes).*
>
> *The project conflicts with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.*
>
> *If the project site design does not have adequate parking or circulation capacity to accommodate the anticipated demand. (Parking demand shall be measured first using the City Parking requirements but may be adjusted using ITE 85 percentile parking generation rates and shared parking analysis factors at the discretion of the City Engineer and Transportation Manager). The City Parking Ordinance allows reductions but these must be thoroughly substantiated and quantified in the analysis, and they are not generally all applicable to a project.*

Summary of Deficiencies and Improvements

Existing (2022) plus Proposed Project Conditions

As reflected in **Table 4**, the addition of the proposed project results in no intersection deficiencies as defined by the City. The lowest LOS exhibited at any one study facilities is C under the Existing plus Proposed Project scenario.

Cumulative (2030) plus Proposed Project Conditions

As reflected in **Table 5**, the addition of the proposed project results in one intersection deficiency at the Front Street intersection with Soquel Avenue (Intersection #1) as defined by the City of Santa Cruz. Using the improvements proposed for Front Street as part of the Downtown Intersections Improvement Plan, the LOS and delay can be reduced from F to E and 206.0 to 73.7, respectively, as shown in **Table 6**. The analysis worksheet for Intersection #1 for Cumulative plus Proposed Project (Improved) conditions can be found at in **Appendix F**. The improvements include modifying the southbound approach to include a dedicated left-turn lane and an all-movement (left-thru-right) lane. This geometric configuration was chosen because it had been proposed as an improvement at this intersection in a past study[5] with the goal of having the intersection operate at LOS E. No other solution that was tested was able to reduce the delay to lower than what is shown in **Table 6**. While no feasible improvements were identified that would reduce the LOS and delay to LOS D, it should be noted that under the City's existing General Plan, the City accepts a lower LOS at some major regional intersections such as this one per Circulation Policy 5.1.2.

Table 6 – Cumulative (2030) plus Proposed Project plus Improvements Intersection Levels of Service

ID	Intersection	LOS Threshold	Control	Peak Hour	Cumulative (2030) plus Proposed Project		Cumulative (2030) plus Proposed Project (Improved)	
					Delay (sec)	LOS	Delay (sec)	LOS
1	Front Street @ Soquel Avenue	D	Signal	PM	206.0	F	73.7	E

Notes: Bold represents unacceptable operations. The City of Santa Cruz has established LOS D as the minimum acceptable LOS for overall intersection operations during the AM and PM peak hours. However, under the existing General Plan, the City accepts a lower LOS (E) at some major regional intersections per existing Circulation Policy 5.1.2.

[5] *Santa Cruz Downtown Recover Plan Amendment – Traffic Study*. Kimley-Horn for the City of Santa Cruz. May 10, 2017.

VEHICLE MILES TRAVELED (VMT)

The proposed project is located in a VMT Efficient Area based on the Santa Cruz County Residential Screening Map[6]. This means that based on the VMT per capita threshold set by the City and County, the proposed project is located in an area that produces VMT per capita that is at least 15-percent below the Countywide average. Therefore, as noted in the memo developed by the City's Public Works Department and provided as **Appendix G**, the VMT for the proposed project is assumed to be less than significant in accordance with the adopted City of Santa Cruz guidelines.

OTHER CONSIDERATIONS

Intersection Queuing Evaluation

A queuing study was conducted to evaluate the capacity of the existing turn lanes at the study intersections. Synchro reports were used to conduct the queuing analysis. The 95th percentile vehicle queues were compared against the existing vehicle storage lengths at select intersection movements to determine if the queues are anticipated to exceed their available storage. Results of the queuing evaluation are presented in **Table 7**. Analysis sheets that include the anticipated vehicle queues are presented in **Appendices B – D**.

As presented in **Table 7**, the addition of the proposed project adds relatively small amounts of additional queuing except at the Front Street intersection with Soquel Avenue (Intersection #1). Shaded cells in the table represent conditions where the reported queue exceeds available vehicle storage capacity by more than one car length (25 ft). The addition of the proposed project results in the following:

- Except for the northbound right movement at the Soquel Avenue intersection with Front Street (Intersection #1) and both the eastbound right and northbound left movements at the Cathcart intersection with Front Street (Intersection #2), the project does not cause any queue lengths to exceed the available storage or increase queue lengths that are deficient without the addition of the project.
    - The northbound right movement at Intersection #1 is shared with the second through lane (shared through-right), so the through trips affect the queue length at this intersection. As there is significant storage for the approach as a whole (one lane into two at the intersection) it is not anticipated that any safety issues will arise with this increased queue length. In addition, improvements are planned for this intersection in the near future that would improve safety for all users by slightly modifying the intersection geometry (eastbound number one lane will be converted from a through-left to a left-only lane) and adding additional bicyclist infrastructure such as bike lane striping across the intersection for the Front Street approaches and a bike box for the westbound approach.
    - For the eastbound right movement at Intersection #2, while the 95th percentile queue exceeds the available storage, the average queue length is only 25-feet (one vehicle length). In addition, the project only adds 4 trips per hour at this movement or one vehicle every 15 minutes. Therefore, no safety issues are anticipated at this intersection either due to the identified queue length with the addition of the project.
    - For the northbound left movement at Intersection #2, while the 95th percentile queue exceeds the available storage, the average queue length is 70-feet, less than the available storage. In addition, the project only adds 7 trips per hour at this movement or two vehicles every 15 minutes. Therefore, no safety issues are anticipated at this intersection.
- At the Cathcart Street intersection with the Project Driveway (Intersection #5), the 95th percentile queue for the eastbound left movement is one vehicle or 25-feeet. There are no anticipated safety issues related to off-street queuing at Intersection #5.

6 *Analyzing Vehicle Miles Traveled for CEQA Compliance. SB 743 Implementation Guidelines for the County of Santa Cruz*. Santa Cruz County Planning Department. Implemented July 2020. Updated May 2021.

Table 7 – Intersection Queuing Evaluation Results

Intersection / Analysis Scenario	Movement	AM Peak-Hour		PM Peak-Hour	
		Available Storage (ft)	95th % Queue (ft)	Available Storage (ft)	95th % Queue (ft)
#1, Front Street @Soquel Avenue	**NBR**				
Existing (2022)		100	80	100	151
Existing (2022) plus Proposed Project			83		177
Cumulative (2030) plus Proposed Project			-		516
	NBL				
Existing (2022)		-	80	-	151
Existing (2022) plus Proposed Project			83		177
Cumulative (2030) plus Proposed Project			-		516
	WBL				
Existing (2022)		-	168	-	214
Existing (2022) plus Proposed Project			172		229
Cumulative (2030) plus Proposed Project			-		470
#2, Front Street @Cathcart Street	**EBR**				
Existing (2022)		25	16	25	24
Existing (2022) plus Proposed Project			17		37
Cumulative (2030) plus Proposed Project			-		70
	NBL				
Existing (2022)		100	24	100	56
Existing (2022) plus Proposed Project			29		72
Cumulative (2030) plus Proposed Project			-		171
	SBR				
Existing (2022)		-	60	-	127
Existing (2022) plus Proposed Project			65		135
Cumulative (2030) plus Proposed Project			-		236
#3, Cathcart Street @Pacific Avenue	**EBR**				
Existing (2022)		-	75	-	50
Existing (2022) plus Proposed Project			100		150
Cumulative (2030) plus Proposed Project			-		100
	NBL				
Existing (2022)		-	25	-	50
Existing (2022) plus Proposed Project			25		50
Cumulative (2030) plus Proposed Project			-		125
#4, Cathcart Street @Cedar Street	**WBL/R**				
Existing (2022)		-	25	-	25
Existing (2022) plus Proposed Project			25		25
Cumulative (2030) plus Proposed Project			-		75
	NBR				
Existing (2022)		-	25	-	25
Existing (2022) plus Proposed Project			25		50
Cumulative (2030) plus Proposed Project			-		50
	SBL				
Existing (2022)		-	25	-	75
Existing (2022) plus Proposed Project			25		75
Cumulative (2030) plus Proposed Project			-		150
#5, Cathcart Street @ Project Driveway	**EBL**				
Existing (2022) plus Proposed Project		-	25	-	25
Cumulative (2030) plus Proposed Project			-		25

Source: *Highway Capacity Manual (HCM) 2016* methodology per Synchro© v11/Simtraffic.
Notes: For approaches with dual left-turn lanes, the longest queue length is reported.
*Minimal 95th Percentile Queue, shaded cell indicates queue exceeds storage by > 25' (one vehicle length)

On-Site Transportation Review

In accordance with the City's *Guidelines*[3], the following aspects of the proposed project were evaluated:

1. ***Proximity of proposed site driveway(s) to other driveways or intersections***
   Access to the site is provided via one (1) proposed roadway connections to Cathcart Street and one (1) one-way alley. A one-way alley follows the east side of the development and connects Cathcart Street and Lincoln Street. Both access points will be sufficient to serve delivery trucks, fire trucks, and other oversized vehicles.
2. ***Adequacy of vehicle parking relative to both the anticipated demand and zoning code requirements***
   All required parking is anticipated to be accommodated entirely on-site. While existing on-street and off-street parking spaces will be removed with the addition of the project, a comparable number of parking spots will be included as part of the proposed project.
3. ***Adequacy of the project site design to convey all vehicle types***
   The site will include access which is anticipated to accommodate the circulation needs of all vehicle types, including fire access. The proposed project will be utilizing proposed roadway connections to Cathcart Street and Lincoln Street.
4. ***Adequacy of sight distance on-site***
   It is anticipated that sufficient sight distance for the proposed project driveway will be provided in a manner consistent with the guidelines presented in the *Geometric Design of Highways and Streets*, published by the American Association of State Highway and Transportation Officials (AASHTO), and the *Highway Design Manual*, published by Caltrans. According to the project site plan (**Figure 2**) there appears to be adequate sight distance on-site to facilitate safe and orderly circulation. It should also be noted that the entrance for the parking garage will be set back and an open-air design with support pillars will provide exiting vehicles with sight lines in both directions, including of the sidewalk for approaching directions. This contrasts with many garages designed with walls until the exit point. The project design will provide adequate sight distance for exiting vehicles of both oncoming vehicles and pedestrians.

Other Transportation-Related Deficiencies and Improvement Considerations

In accordance with the City's *Guidelines*[3], the proposed project was evaluated against the following *General Plan* goals:

- ***Emergency Vehicle Access***
  The Fire Code of Santa Cruz County (Chapter 7.92)[7] states that fire apparatus access roads shall be a minimum of "12 ft (3658 mm) for an access road or driveway serving two or fewer habitable structures." As shown in project site plan (**Figure 2**), the project site will allow fire access to all parcels with a minimum alley width of 15'-3". As such, the proposed project is considered to allow for adequate access and on-site circulation for emergency vehicles.
- ***Deliveries of Goods and Services***
  The proposed project is considered to allow for adequate on-site circulation for all vehicle types, including delivery vehicles for goods and services. Delivery vehicles will be able to circulate the site using access to the parking garage from Cathcart Street.
- ***Access to Public Transit Services consistent with the City of Santa Cruz 2030 General Plan GOAL M1: "Land use patterns, street design, parking, and access solutions that facilitate multiple transportation alternatives (Cf. Lu4 Lu4.1.1, Lu4.2, ED1.9.2, and M2.2, 2.3.2, and 3.1.9)"***[8]
  There is a transit center located approximately 1,000 feet southeast of the project site. The site is connected to existing pedestrian facilities and is planned to improve the pedestrian facilities adjacent to the site by widening sidewalks.

[7] *Santa Cruz County Code – Chapter 7.92 FIRE CODE*, Santa Cruz County
[8] *City of Santa Cruz 2030 General Plan*, City of Santa Cruz

- ***Non-Motorized Transportation consistent with the City of Santa Cruz 2030 General Plan GOAL M2: "A safe, sustainable, efficient, adaptive, and accessible transportation system"*** [8]
  Bike parking facilities will be installed throughout the project site, with a total of 256 Class II bike parking spots.

CONCLUSIONS

Significant findings of this study include:

- The proposed project is estimated to generate 2,144 new daily trips with 82 new trips occurring during the AM peak-hour and 269 new trips occurring during the PM peak-hour.
- As defined by the City, the addition of the proposed project to the Existing (2022) Conditions does not result in any of the study facilities operating below acceptable City LOS thresholds.
- For Cumulative (2030) plus Proposed Project conditions, the addition of the proposed project results in one intersection deficiency at the Front Street intersection with Soquel Avenue (Intersection #1) as defined by the City of Santa Cruz. Using the improvements proposed for Front Street as part of the Downtown Intersections Improvement Plan, the LOS and delay can be reduced from F to E and 206.0 to 73.7, respectively, as shown in **Table 6**. The improvements include modifying the southbound approach to include a dedicated left-turn lane and an all-movement (left-thru-right) lane. This geometric configuration was chosen because it had been proposed as an improvement at this intersection in a past study[9] with the goal of having the intersection operate at LOS E. No feasible improvements were identified that would reduce the LOS and delay to LOS D.
- Except for the northbound right movement at the Soquel Avenue intersection with Front Street (Intersection #1) and both the eastbound right and northbound left movements at the Cathcart intersection with Front Street (Intersection #2), the project does not cause any queue lengths to exceed the available storage or increase queue lengths that are deficient without the addition of the project.
  - The northbound right movement at Intersection #1 is shared with the second through lane (shared through-right), so the through trips affect the queue length at this intersection. As there is significant storage for the approach as a whole (one lane into two at the intersection) it is not anticipated that any safety issues will arise with this increased queue length.
  - For the eastbound right movement at Intersection #2, while the 95th percentile queue exceeds the available storage, the average queue length is only 25-feet (one vehicle length). In addition, the project only adds 4 trips per hour at this movement or one vehicle every 15 minutes. Therefore, no safety issues are anticipated at this intersection either due to the identified queue length with the addition of the project.
  - For the northbound left movement at Intersection #2, while the 95th percentile queue exceeds the available storage, the average queue length is 70-feet, less than the available storage. In addition, the project only adds 7 trips per hour at this movement or two vehicles every 15 minutes. Therefore, no safety issues are anticipated at this intersection.
- At the Cathcart Street intersection with the Project Driveway (Intersection #5), the 95th percentile queue for the eastbound left movement is one vehicle or 25-feet. There are no anticipated safety issues related to off-street queuing at Intersection #5.
- The entrance for the parking garage will be set back and an open-air design with support pillars will provide exiting vehicles with sight lines in both directions, including of the sidewalk for approaching directions. This contrasts with many garages designed with walls until the exit point. The project design will provide adequate sight distance for exiting vehicles of both oncoming vehicles and pedestrians.

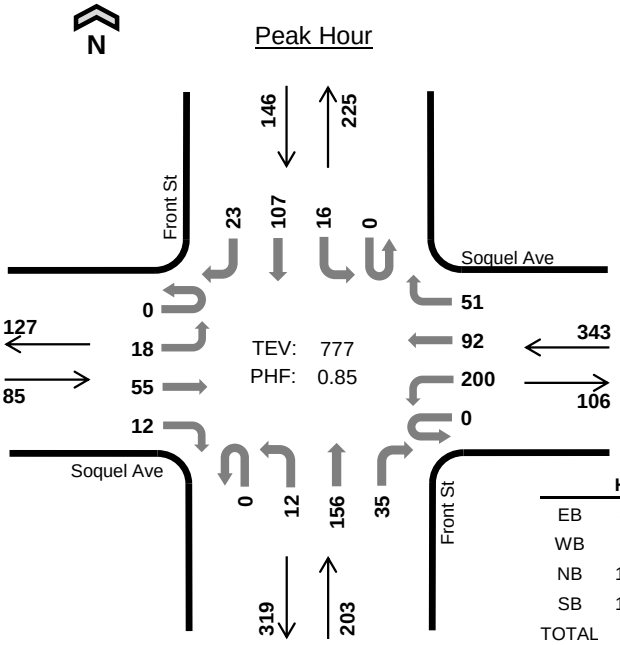
[9] *Santa Cruz Downtown Recover Plan Amendment – Traffic Study*. Kimley-Horn for the City of Santa Cruz. May 10, 2017.

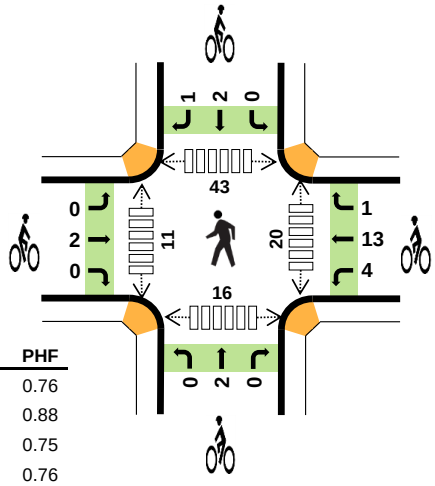
Appendix A

Traffic Count Data Sheets

Front St
Soquel Ave

Date: 09/15/2022
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM





	HV %:	PHF
EB	4.7%	0.76
WB	7.9%	0.88
NB	11.3%	0.75
SB	11.6%	0.76
TOTAL	9.1%	0.85

Two-Hour Count Summaries

Interval Start	Soquel Ave Eastbound				Soquel Ave Westbound				Front St Northbound				Front 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	2	1	0	0	24	6	1	0	1	19	3	0	0	9	0	66	0
7:15 AM	0	4	9	0	0	19	11	3	0	2	18	2	0	3	20	1	92	0
7:30 AM	0	1	4	2	0	26	9	4	0	2	18	12	0	6	19	3	106	0
7:45 AM	0	1	4	4	0	29	8	8	0	1	35	9	0	5	18	3	125	389
8:00 AM	**0**	**4**	**8**	**4**	**0**	**47**	**24**	**3**	**0**	**2**	**36**	**12**	**0**	**5**	**21**	**4**	**170**	493
8:15 AM	**0**	**2**	**14**	**4**	**0**	**43**	**30**	**7**	**0**	**4**	**36**	**5**	**0**	**3**	**25**	**4**	**177**	578
8:30 AM	**0**	**7**	**19**	**2**	**0**	**58**	**19**	**20**	**0**	**0**	**32**	**8**	**0**	**4**	**27**	**5**	**201**	673
8:45 AM	**0**	**5**	**14**	**2**	**0**	**52**	**19**	**21**	**0**	**6**	**52**	**10**	**0**	**4**	**34**	**10**	**229**	**777**
Count Total	0	26	73	18	0	298	126	67	0	18	246	61	0	30	173	30	1,166	0
Peak Hour All	**0**	**18**	**55**	**12**	**0**	**200**	**92**	**51**	**0**	**12**	**156**	**35**	**0**	**16**	**107**	**23**	**777**	**0**
Peak Hour HV	**0**	**0**	**3**	**1**	**0**	**22**	**3**	**2**	**0**	**0**	**17**	**6**	**0**	**3**	**12**	**2**	**71**	**0**
Peak Hour HV%	**-**	**0%**	**5%**	**8%**	**-**	**11%**	**3%**	**4%**	**-**	**0%**	**11%**	**17%**	**-**	**19%**	**11%**	**9%**	**9%**	**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	2	4	3	*9*	0	1	0	0	*1*	3	8	8	3	*22*
7:15 AM	1	3	6	6	*16*	0	2	1	0	*3*	0	1	13	2	*16*
7:30 AM	1	4	4	6	*15*	1	4	2	1	*8*	3	7	13	4	*27*
7:45 AM	0	6	6	2	*14*	0	1	1	0	*2*	3	2	10	4	*19*
8:00 AM	**1**	**6**	**4**	**3**	***14***	**2**	**4**	**0**	**1**	***7***	**7**	**2**	**9**	**7**	*25*
8:15 AM	**1**	**7**	**5**	**5**	***18***	**0**	**9**	**0**	**1**	***10***	**6**	**3**	**15**	**5**	*29*
8:30 AM	**1**	**6**	**6**	**4**	***17***	**0**	**3**	**1**	**1**	***5***	**5**	**3**	**10**	**0**	*18*
8:45 AM	**1**	**8**	**8**	**5**	***22***	**0**	**2**	**1**	**0**	***3***	**2**	**3**	**9**	**4**	***18***
Count Total	6	42	43	34	*125*	3	26	6	4	*39*	29	29	87	29	*174*
Peak Hour	**4**	**27**	**23**	**17**	***71***	**2**	**18**	**2**	**3**	***25***	**20**	**11**	**43**	**16**	***90***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Soquel Ave Eastbound				Soquel Ave Westbound				Front St Northbound				Front 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	0	0	0	0	2	0	0	0	0	2	2	0	0	3	0	9	0
7:15 AM	0	0	1	0	0	2	0	1	0	0	5	1	0	0	5	1	16	0
7:30 AM	0	0	0	1	0	4	0	0	0	0	3	1	0	0	6	0	15	0
7:45 AM	0	0	0	0	0	5	1	0	0	0	4	2	0	0	2	0	14	54
8:00 AM	**0**	**0**	**0**	**1**	**0**	**5**	**1**	**0**	**0**	**0**	**3**	**1**	**0**	**1**	**2**	**0**	**14**	59
8:15 AM	**0**	**0**	**1**	**0**	**0**	**6**	**0**	**1**	**0**	**0**	**5**	**0**	**0**	**1**	**4**	**0**	**18**	61
8:30 AM	**0**	**0**	**1**	**0**	**0**	**5**	**0**	**1**	**0**	**0**	**3**	**3**	**0**	**0**	**4**	**0**	**17**	63
8:45 AM	**0**	**0**	**1**	**0**	**0**	**6**	**2**	**0**	**0**	**0**	**6**	**2**	**0**	**1**	**2**	**2**	**22**	**71**
Count Total	0	0	4	2	0	35	4	3	0	0	31	12	0	3	28	3	125	0
Peak Hour	**0**	**0**	**3**	**1**	**0**	**22**	**3**	**2**	**0**	**0**	**17**	**6**	**0**	**3**	**12**	**2**	**71**	**0**

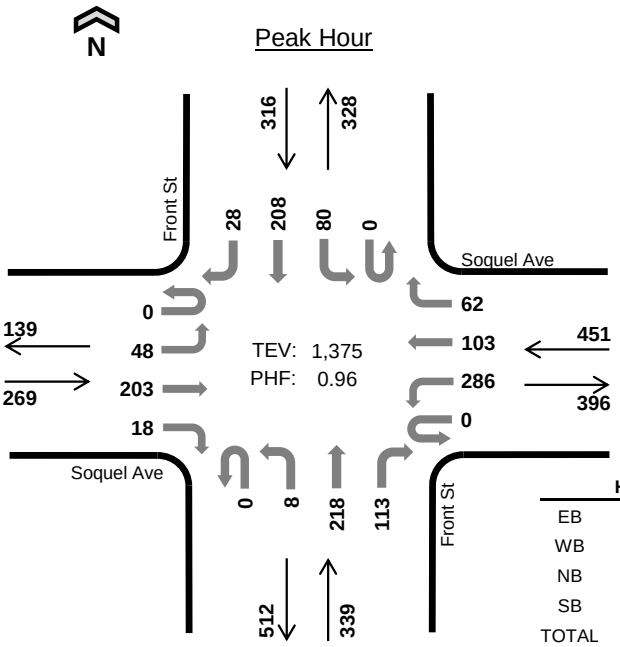
Two-Hour Count Summaries - Bikes

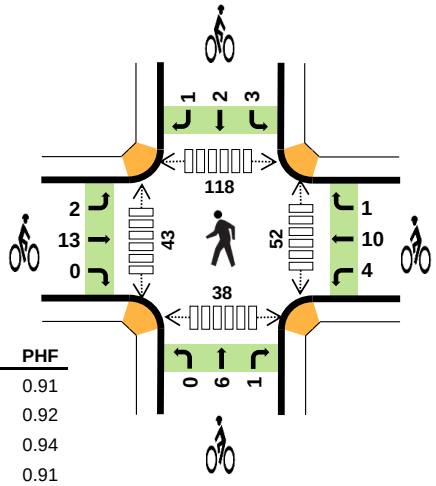
Interval Start	Soquel Ave Eastbound			Soquel Ave Westbound			Front St Northbound			Front St Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	1	0
7:15 AM	0	0	0	1	1	0	0	0	1	0	0	0	3	0
7:30 AM	0	1	0	2	2	0	0	1	1	0	0	1	8	0
7:45 AM	0	0	0	0	1	0	0	0	1	0	0	0	2	14
8:00 AM	**0**	**2**	**0**	**1**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**7**	20
8:15 AM	**0**	**0**	**0**	**0**	**8**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**10**	27
8:30 AM	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**5**	24
8:45 AM	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**3**	**25**
Count Total	0	3	0	7	17	2	0	3	3	0	2	2	39	0
Peak Hour	**0**	**2**	**0**	**4**	**13**	**1**	**0**	**2**	**0**	**0**	**2**	**1**	**25**	**0**

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

Front St
Soquel Ave

Date: 09/15/2022
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM





	HV %:	PHF
EB	0.7%	0.91
WB	3.1%	0.92
NB	4.4%	0.94
SB	3.5%	0.91
TOTAL	3.1%	0.96

Two-Hour Count Summaries

Interval Start	Soquel Ave Eastbound				Soquel Ave Westbound				Front St Northbound				Front 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**	**17**	**46**	**5**	**0**	**72**	**32**	**19**	**0**	**6**	**49**	**31**	**0**	**18**	**58**	**4**	**357**	0
4:15 PM	**0**	**9**	**62**	**3**	**0**	**75**	**23**	**14**	**0**	**0**	**60**	**24**	**0**	**20**	**48**	**6**	**344**	0
4:30 PM	**0**	**11**	**54**	**6**	**0**	**61**	**26**	**14**	**0**	**1**	**45**	**33**	**0**	**21**	**58**	**8**	**338**	0
4:45 PM	**0**	**11**	**41**	**4**	**0**	**78**	**22**	**15**	**0**	**1**	**64**	**25**	**0**	**21**	**44**	**10**	**336**	**1,375**
5:00 PM	0	10	44	4	0	74	27	22	0	2	55	27	0	18	52	13	348	1,366
5:15 PM	0	14	36	4	0	83	22	10	0	4	46	21	0	20	51	9	320	1,342
5:30 PM	0	4	34	11	0	81	11	13	0	2	55	19	0	22	56	16	324	1,328
5:45 PM	0	9	25	6	0	61	28	11	0	3	64	20	0	23	53	7	310	1,302
Count Total	0	85	342	43	0	585	191	118	0	19	438	200	0	163	420	73	2,677	0
Peak Hour All	**0**	**48**	**203**	**18**	**0**	**286**	**103**	**62**	**0**	**8**	**218**	**113**	**0**	**80**	**208**	**28**	**1,375**	**0**
Peak Hour HV	**0**	**0**	**2**	**0**	**0**	**8**	**2**	**4**	**0**	**0**	**12**	**3**	**0**	**1**	**10**	**0**	**42**	**0**
Peak Hour HV%	**-**	**0%**	**1%**	**0%**	**-**	**3%**	**2%**	**6%**	**-**	**0%**	**6%**	**3%**	**-**	**1%**	**5%**	**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
4:00 PM	**0**	**5**	**3**	**4**	***12***	**6**	**4**	**1**	**2**	***13***	**17**	**6**	**24**	**13**	*60*
4:15 PM	**0**	**4**	**3**	**1**	***8***	**1**	**5**	**2**	**1**	***9***	**17**	**4**	**25**	**14**	*60*
4:30 PM	**1**	**2**	**4**	**4**	***11***	**4**	**2**	**3**	**1**	***10***	**10**	**15**	**38**	**7**	*70*
4:45 PM	**1**	**3**	**5**	**2**	***11***	**4**	**4**	**1**	**2**	***11***	**8**	**18**	**31**	**4**	***61***
5:00 PM	1	4	3	3	*11*	7	5	6	3	*21*	16	13	25	14	*68*
5:15 PM	0	3	1	1	*5*	3	2	1	3	*9*	16	8	28	5	*57*
5:30 PM	2	4	5	4	*15*	3	4	4	2	*13*	13	4	28	6	*51*
5:45 PM	1	2	7	5	*15*	0	4	2	3	*9*	17	10	45	9	*81*
Count Total	6	27	31	24	*88*	28	30	20	17	*95*	114	78	244	72	*508*
Peak Hour	**2**	**14**	**15**	**11**	***42***	**15**	**15**	**7**	**6**	***43***	**52**	**43**	**118**	**38**	***251***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Soquel Ave Eastbound				Soquel Ave Westbound				Front St Northbound				Front 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**	**0**	**0**	**0**	**0**	**2**	**2**	**1**	**0**	**0**	**1**	**2**	**0**	**1**	**3**	**0**	**12**	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**1**	**0**	**8**	0
4:30 PM	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**3**	**1**	**0**	**0**	**4**	**0**	**11**	0
4:45 PM	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**2**	**0**	**0**	**5**	**0**	**0**	**0**	**2**	**0**	**11**	**42**
5:00 PM	0	0	0	1	0	1	1	2	0	0	2	1	0	1	2	0	11	41
5:15 PM	0	0	0	0	0	2	0	1	0	0	1	0	0	0	1	0	5	38
5:30 PM	0	1	1	0	0	3	0	1	0	0	3	2	0	0	4	0	15	42
5:45 PM	0	0	1	0	0	2	0	0	0	0	6	1	0	1	4	0	15	46
Count Total	0	1	4	1	0	16	3	8	0	0	24	7	0	3	21	0	88	0
Peak Hour	**0**	**0**	**2**	**0**	**0**	**8**	**2**	**4**	**0**	**0**	**12**	**3**	**0**	**1**	**10**	**0**	**42**	**0**

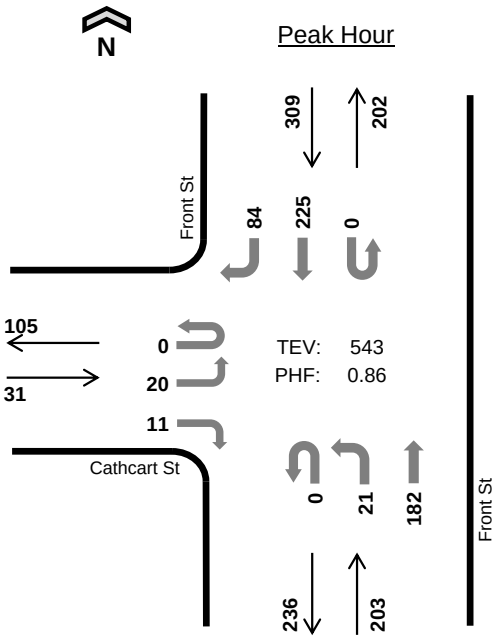
Two-Hour Count Summaries - Bikes

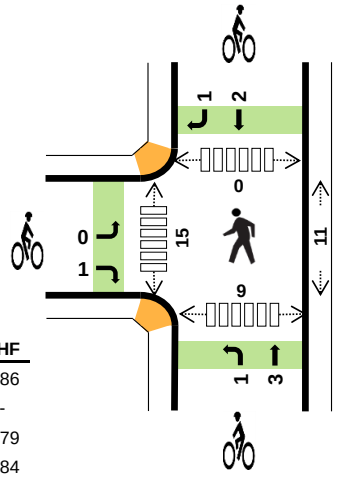
Interval Start	Soquel Ave Eastbound			Soquel Ave Westbound			Front St Northbound			Front St Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	**1**	**5**	**0**	**1**	**3**	**0**	**0**	**1**	**0**	**2**	**0**	**0**	**13**	0
4:15 PM	**0**	**1**	**0**	**2**	**2**	**1**	**0**	**2**	**0**	**1**	**0**	**0**	**9**	0
4:30 PM	**1**	**3**	**0**	**0**	**2**	**0**	**0**	**2**	**1**	**0**	**1**	**0**	**10**	0
4:45 PM	**0**	**4**	**0**	**1**	**3**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**11**	**43**
5:00 PM	1	6	0	0	3	2	0	5	1	1	0	2	21	51
5:15 PM	1	2	0	0	2	0	0	0	1	0	0	3	9	51
5:30 PM	1	2	0	0	2	2	0	3	1	0	0	2	13	54
5:45 PM	0	0	0	0	4	0	0	1	1	2	1	0	9	52
Count Total	5	23	0	4	21	5	0	15	5	6	3	8	95	0
Peak Hour	**2**	**13**	**0**	**4**	**10**	**1**	**0**	**6**	**1**	**3**	**2**	**1**	**43**	**0**

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

Front St
Cathcart St

Date: 09/15/2022
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM





	HV %:	PHF
EB	9.7%	0.86
WB	-	-
NB	12.8%	0.79
SB	11.7%	0.84
TOTAL	12.0%	0.86

Two-Hour Count Summaries

Interval Start	Cathcart St Eastbound				N/A Westbound				Front St Northbound				Front 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	0	1	0	0	0	0	0	8	18	0	0	0	19	12	62	0
7:15 AM	0	4	0	2	0	0	0	0	0	7	16	0	0	0	25	10	64	0
7:30 AM	0	4	0	2	0	0	0	0	0	4	26	0	0	0	34	11	81	0
7:45 AM	0	6	0	6	0	0	0	0	0	4	40	0	0	0	37	11	104	311
8:00 AM	**0**	**6**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**4**	**45**	**0**	**0**	**0**	**51**	**18**	**127**	376
8:15 AM	**0**	**5**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**40**	**0**	**0**	**0**	**39**	**24**	**112**	424
8:30 AM	**0**	**2**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**9**	**39**	**0**	**0**	**0**	**65**	**27**	**146**	489
8:45 AM	**0**	**7**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**6**	**58**	**0**	**0**	**0**	**70**	**15**	**158**	**543**
Count Total	0	38	0	22	0	0	0	0	0	44	282	0	0	0	340	128	854	0
Peak Hour All	**0**	**20**	**0**	**11**	**0**	**0**	**0**	**0**	**0**	**21**	**182**	**0**	**0**	**0**	**225**	**84**	**543**	**0**
Peak Hour HV	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**3**	**23**	**0**	**0**	**0**	**22**	**14**	**65**	**0**
Peak Hour HV%	**-**	**5%**	**-**	**18%**	**-**	**-**	**-**	**-**	**-**	**14%**	**13%**	**-**	**-**	**-**	**10%**	**17%**	**12%**	**0**

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

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	0	3	5	*8*	0	0	1	0	*1*	1	5	0	0	*6*
7:15 AM	2	0	3	6	*11*	0	0	3	1	*4*	1	3	0	0	*4*
7:30 AM	0	0	6	11	*17*	0	0	2	3	*5*	4	6	1	0	*11*
7:45 AM	1	0	5	6	*12*	1	0	0	0	*1*	2	2	1	0	*5*
8:00 AM	**2**	**0**	**6**	**9**	***17***	**0**	**0**	**1**	**1**	***2***	**3**	**1**	**0**	**0**	*4*
8:15 AM	**0**	**0**	**6**	**9**	***15***	**1**	**0**	**0**	**1**	***2***	**0**	**7**	**0**	**0**	*7*
8:30 AM	**1**	**0**	**6**	**10**	***17***	**0**	**0**	**0**	**0**	***0***	**6**	**5**	**0**	**4**	*15*
8:45 AM	**0**	**0**	**8**	**8**	***16***	**0**	**0**	**3**	**1**	***4***	**2**	**2**	**0**	**5**	***9***
Count Total	6	0	43	64	*113*	2	0	10	7	*19*	19	31	2	9	*61*
Peak Hr	**3**	**0**	**26**	**36**	***65***	**1**	**0**	**4**	**3**	***8***	**11**	**15**	**0**	**9**	***35***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Cathcart St				N/A				Front St				Front 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	0	0	0	3	0	0	0	3	2	8	0
7:15 AM	0	2	0	0	0	0	0	0	0	0	3	0	0	0	3	3	11	0
7:30 AM	0	0	0	0	0	0	0	0	0	1	5	0	0	0	7	4	17	0
7:45 AM	0	1	0	0	0	0	0	0	0	0	5	0	0	0	5	1	12	48
8:00 AM	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**4**	**0**	**0**	**0**	**7**	**2**	**17**	57
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**4**	**5**	**15**	61
8:30 AM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**5**	**0**	**0**	**0**	**6**	**4**	**17**	61
8:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**5**	**3**	**16**	**65**
Count Total	0	4	0	2	0	0	0	0	0	4	39	0	0	0	40	24	113	0
Peak Hour	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**3**	**23**	**0**	**0**	**0**	**22**	**14**	**65**	**0**

Two-Hour Count Summaries - Bikes

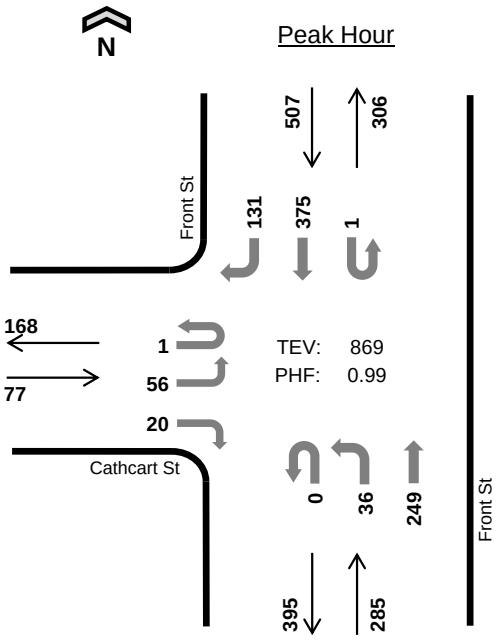
Interval Start	Cathcart St			N/A			Front St			Front St			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	1	0
7:15 AM	0	0	0	0	0	0	1	2	0	0	1	0	4	0
7:30 AM	0	0	0	0	0	0	0	2	0	0	2	1	5	0
7:45 AM	1	0	0	0	0	0	0	0	0	0	0	0	1	11
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**2**	12
8:15 AM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**2**	10
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	5
8:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**1**	**4**	**8**
Count Total	1	0	1	0	0	0	2	8	0	0	5	2	19	0
Peak Hour	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**3**	**0**	**0**	**2**	**1**	**8**	**0**

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

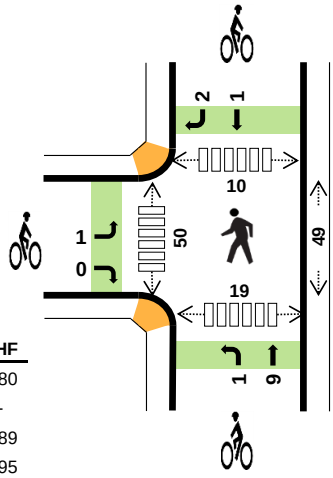
Front St
Cathcart St

Date: 09/15/2022
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM

Peak Hour



	HV %:	PHF
EB	6.5%	0.80
WB	-	-
NB	4.2%	0.89
SB	3.4%	0.95
TOTAL	3.9%	0.99



Two-Hour Count Summaries

Interval Start	Cathcart St Eastbound				N/A Westbound				Front St Northbound				Front 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	11	0	4	0	0	0	0	0	9	69	0	0	0	102	26	221	0
4:15 PM	0	9	0	3	0	0	0	0	0	9	73	0	0	0	87	28	209	0
4:30 PM	0	12	0	1	0	0	0	0	0	8	65	0	0	0	96	32	214	0
4:45 PM	**0**	**15**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**8**	**72**	**0**	**0**	**0**	**90**	**30**	**220**	864
5:00 PM	**0**	**17**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**12**	**60**	**0**	**0**	**0**	**87**	**35**	**218**	861
5:15 PM	**0**	**7**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**9**	**60**	**0**	**1**	**0**	**99**	**33**	**213**	865
5:30 PM	**1**	**17**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**7**	**57**	**0**	**0**	**0**	**99**	**33**	**218**	**869**
5:45 PM	0	13	0	4	0	0	0	0	0	9	78	0	0	0	87	29	220	869
Count Total	1	101	0	32	0	0	0	0	0	71	534	0	1	0	747	246	1,733	0
Peak Hour All	**1**	**56**	**0**	**20**	**0**	**0**	**0**	**0**	**0**	**36**	**249**	**0**	**1**	**0**	**375**	**131**	**869**	**0**
Peak Hour HV	**0**	**4**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**10**	**0**	**0**	**0**	**9**	**8**	**34**	**0**
Peak Hour HV%	**0%**	**7%**	**-**	**5%**	**-**	**-**	**-**	**-**	**-**	**6%**	**4%**	**-**	**0%**	**-**	**2%**	**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
4:00 PM	1	0	3	5	*9*	0	0	0	1	*1*	12	8	5	5	*30*
4:15 PM	0	0	3	5	*8*	2	0	1	2	*5*	8	12	4	2	*26*
4:30 PM	1	0	3	7	*11*	1	0	3	4	*8*	7	23	0	3	*33*
4:45 PM	**2**	**0**	**5**	**3**	***10***	**0**	**0**	**1**	**0**	***1***	**8**	**18**	**3**	**2**	*31*
5:00 PM	**1**	**0**	**2**	**4**	***7***	**1**	**0**	**5**	**1**	***7***	**11**	**13**	**2**	**9**	*35*
5:15 PM	**0**	**0**	**2**	**4**	***6***	**0**	**0**	**0**	**1**	***1***	**12**	**2**	**3**	**4**	*21*
5:30 PM	**2**	**0**	**3**	**6**	***11***	**0**	**0**	**4**	**1**	***5***	**18**	**17**	**2**	**4**	***41***
5:45 PM	2	0	6	6	*14*	2	0	0	0	*2*	10	9	6	3	*28*
Count Total	9	0	27	40	*76*	6	0	14	10	*30*	86	102	25	32	*245*
Peak Hr	**5**	**0**	**12**	**17**	***34***	**1**	**0**	**10**	**3**	***14***	**49**	**50**	**10**	**19**	***128***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Cathcart St				N/A				Front St				Front 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	1	0	0	0	0	0	0	0	1	2	0	0	0	3	2	9	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	2	8	0
4:30 PM	0	1	0	0	0	0	0	0	0	0	3	0	0	0	5	2	11	0
4:45 PM	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	**0**	**0**	**0**	**1**	**2**	**10**	38
5:00 PM	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**4**	**0**	**7**	36
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**3**	**6**	34
5:30 PM	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**3**	**3**	**11**	**34**
5:45 PM	0	2	0	0	0	0	0	0	0	1	5	0	0	0	3	3	14	38
Count Total	0	8	0	1	0	0	0	0	0	4	23	0	0	0	23	17	76	0
Peak Hour	**0**	**4**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**10**	**0**	**0**	**0**	**9**	**8**	**34**	**0**

Two-Hour Count Summaries - Bikes

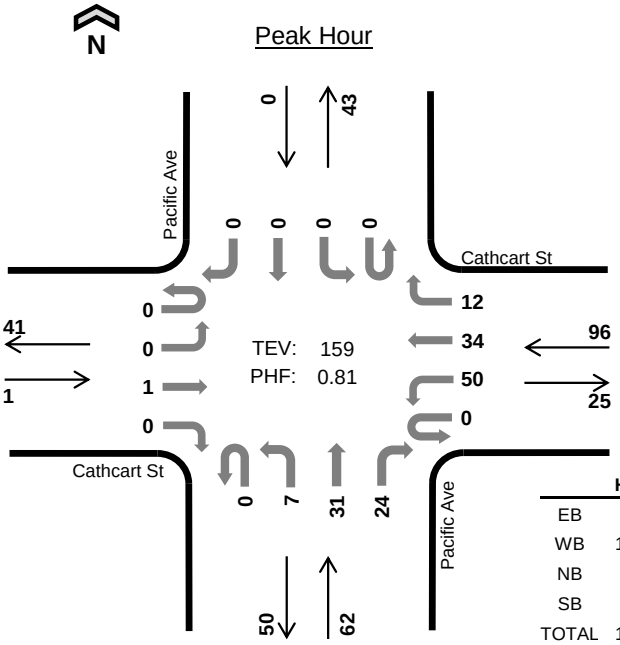
Interval Start	Cathcart St			N/A			Front St			Front St			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0
4:15 PM	0	0	2	0	0	0	0	1	0	0	0	2	5	0
4:30 PM	0	0	1	0	0	0	1	2	0	0	4	0	8	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	15
5:00 PM	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	**0**	**0**	**1**	**0**	**7**	21
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	17
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**1**	**5**	**14**
5:45 PM	2	0	0	0	0	0	0	0	0	0	0	0	2	15
Count Total	3	0	3	0	0	0	2	12	0	0	6	4	30	0
Peak Hour	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**9**	**0**	**0**	**1**	**2**	**14**	**0**

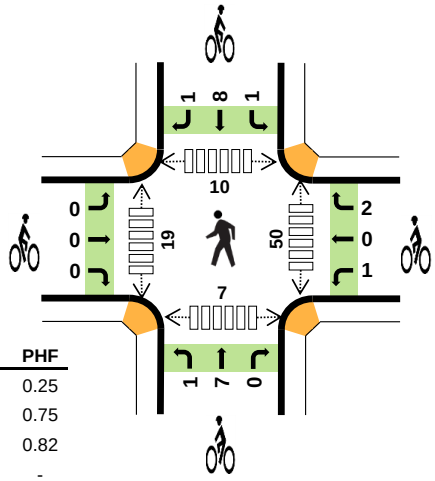
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Pacific Ave
Cathcart St

Date: 09/15/2022
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM

Peak Hour





	HV %:	PHF
EB	0.0%	0.25
WB	18.8%	0.75
NB	9.7%	0.82
SB	-	-
TOTAL	15.1%	0.81

Two-Hour Count Summaries

Interval Start	Cathcart St Eastbound				Cathcart St Westbound				Pacific Ave Northbound				Pacific 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	0	2	0	1	6	5	0	0	1	4	0	0	0	0	0	19	0
7:15 AM	0	0	0	0	0	6	4	1	0	3	9	3	0	0	0	0	26	0
7:30 AM	0	1	0	1	0	10	3	1	0	1	4	1	0	1	0	0	23	0
7:45 AM	0	0	2	0	0	7	6	1	0	1	2	3	0	0	0	0	22	90
8:00 AM	**0**	**0**	**0**	**0**	**0**	**15**	**5**	**1**	**0**	**2**	**4**	**7**	**0**	**0**	**0**	**0**	**34**	105
8:15 AM	**0**	**0**	**0**	**0**	**0**	**10**	**9**	**4**	**0**	**2**	**12**	**5**	**0**	**0**	**0**	**0**	**42**	121
8:30 AM	**0**	**0**	**1**	**0**	**0**	**18**	**10**	**4**	**0**	**2**	**8**	**6**	**0**	**0**	**0**	**0**	**49**	147
8:45 AM	**0**	**0**	**0**	**0**	**0**	**7**	**10**	**3**	**0**	**1**	**7**	**6**	**0**	**0**	**0**	**0**	**34**	**159**
Count Total	0	1	5	1	1	79	52	15	0	13	50	31	0	1	0	0	249	0
Peak Hour All	**0**	**0**	**1**	**0**	**0**	**50**	**34**	**12**	**0**	**7**	**31**	**24**	**0**	**0**	**0**	**0**	**159**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**16**	**2**	**0**	**0**	**1**	**2**	**3**	**0**	**0**	**0**	**0**	**24**	**0**
Peak Hour HV%	**-**	**-**	**0%**	**-**	**-**	**32%**	**6%**	**0%**	**-**	**14%**	**6%**	**13%**	**-**	**-**	**-**	**-**	**15%**	**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	2	0	0	*3*	0	0	2	0	*2*	4	0	1	1	*6*
7:15 AM	0	3	1	0	*4*	0	2	2	1	*5*	12	6	2	2	*22*
7:30 AM	0	6	1	0	*7*	0	1	1	0	*2*	7	10	1	0	*18*
7:45 AM	0	1	1	0	*2*	0	0	0	2	*2*	14	9	1	3	*27*
8:00 AM	**0**	**5**	**2**	**0**	***7***	**0**	**1**	**3**	**4**	***8***	**9**	**4**	**4**	**3**	*20*
8:15 AM	**0**	**4**	**1**	**0**	***5***	**0**	**0**	**0**	**1**	***1***	**15**	**6**	**3**	**1**	*25*
8:30 AM	**0**	**6**	**2**	**0**	***8***	**0**	**0**	**1**	**3**	***4***	**13**	**5**	**2**	**3**	*23*
8:45 AM	**0**	**3**	**1**	**0**	***4***	**0**	**2**	**4**	**2**	***8***	**13**	**4**	**1**	**0**	***18***
Count Total	1	30	9	0	*40*	0	6	13	13	*32*	87	44	15	13	*159*
Peak Hour	**0**	**18**	**6**	**0**	***24***	**0**	**3**	**8**	**10**	***21***	**50**	**19**	**10**	**7**	***86***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Cathcart St Eastbound				Cathcart St Westbound				Pacific Ave Northbound				Pacific 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	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	3	0
7:15 AM	0	0	0	0	0	3	0	0	0	0	0	1	0	0	0	0	4	0
7:30 AM	0	0	0	0	0	6	0	0	0	1	0	0	0	0	0	0	7	0
7:45 AM	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	2	16
8:00 AM	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**7**	20
8:15 AM	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**5**	21
8:30 AM	**0**	**0**	**0**	**0**	**0**	**5**	**1**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**8**	22
8:45 AM	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**4**	**24**
Count Total	0	0	1	0	0	28	2	0	0	2	2	5	0	0	0	0	40	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**16**	**2**	**0**	**0**	**1**	**2**	**3**	**0**	**0**	**0**	**0**	**24**	**0**

Two-Hour Count Summaries - Bikes

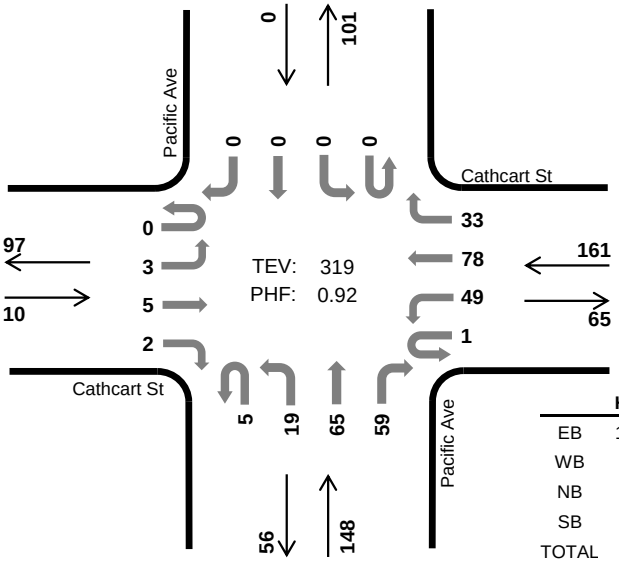
Interval Start	Cathcart St Eastbound			Cathcart St Westbound			Pacific Ave Northbound			Pacific Ave Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	2	0
7:15 AM	0	0	0	0	1	1	0	1	1	0	1	0	5	0
7:30 AM	0	0	0	0	1	0	0	1	0	0	0	0	2	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	2	0	2	11
8:00 AM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**3**	**0**	**0**	**4**	**0**	**8**	17
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	13
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**4**	15
8:45 AM	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**4**	**0**	**0**	**1**	**1**	**8**	**21**
Count Total	0	0	0	1	2	3	1	11	1	1	11	1	32	0
Peak Hour	**0**	**0**	**0**	**1**	**0**	**2**	**1**	**7**	**0**	**1**	**8**	**1**	**21**	**0**

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

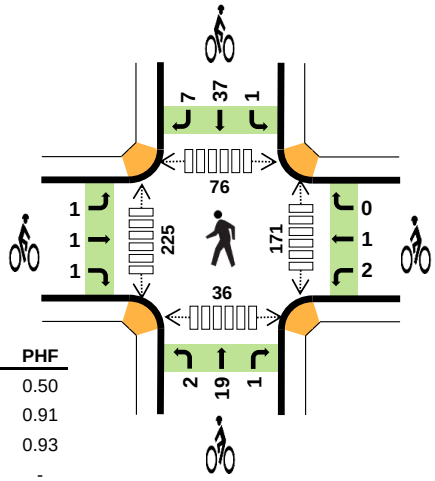
Pacific Ave
Cathcart St

Date: 09/15/2022
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM

Peak Hour



	HV %:	PHF
EB	10.0%	0.50
WB	5.6%	0.91
NB	5.4%	0.93
SB	-	-
TOTAL	5.6%	0.92



Two-Hour Count Summaries

Interval Start	Cathcart St Eastbound				Cathcart St Westbound				Pacific Ave Northbound				Pacific 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	0	0	2	0	0	17	9	4	1	3	20	11	0	0	0	0	67	0
4:15 PM	0	0	0	0	0	19	11	11	1	3	14	7	0	0	0	0	66	0
4:30 PM	0	0	0	0	0	14	11	13	0	2	21	13	0	0	0	0	74	0
4:45 PM	**0**	**1**	**0**	**0**	**0**	**17**	**19**	**8**	**1**	**4**	**13**	**22**	**0**	**0**	**0**	**0**	**85**	292
5:00 PM	**0**	**2**	**0**	**0**	**1**	**9**	**21**	**7**	**1**	**5**	**20**	**13**	**0**	**0**	**0**	**0**	**79**	304
5:15 PM	**0**	**0**	**1**	**1**	**0**	**12**	**19**	**5**	**1**	**3**	**18**	**8**	**0**	**0**	**0**	**0**	**68**	306
5:30 PM	**0**	**0**	**4**	**1**	**0**	**11**	**19**	**13**	**2**	**7**	**14**	**16**	**0**	**0**	**0**	**0**	**87**	**319**
5:45 PM	0	3	2	2	0	10	13	11	0	4	19	9	0	0	0	0	73	307
Count Total	0	6	9	4	1	109	122	72	7	31	139	99	0	0	0	0	599	0
Peak Hour All	**0**	**3**	**5**	**2**	**1**	**49**	**78**	**33**	**5**	**19**	**65**	**59**	**0**	**0**	**0**	**0**	**319**	**0**
Peak Hour HV	**0**	**0**	**1**	**0**	**0**	**9**	**0**	**0**	**0**	**2**	**1**	**5**	**0**	**0**	**0**	**0**	**18**	**0**
Peak Hour HV%	**-**	**0%**	**20%**	**0%**	**0%**	**18%**	**0%**	**0%**	**0%**	**11%**	**2%**	**8%**	**-**	**-**	**-**	**-**	**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
4:00 PM	0	2	2	0	*4*	0	0	2	8	*10*	56	81	27	12	*176*
4:15 PM	0	4	0	0	*4*	2	2	2	12	*18*	44	64	9	12	*129*
4:30 PM	0	2	3	0	*5*	1	1	5	13	*20*	67	46	23	6	*142*
4:45 PM	**0**	**3**	**2**	**0**	***5***	**0**	**2**	**11**	**14**	***27***	**31**	**56**	**10**	**14**	*111*
5:00 PM	**0**	**0**	**1**	**0**	***1***	**3**	**0**	**2**	**11**	***16***	**47**	**55**	**20**	**4**	*126*
5:15 PM	**0**	**3**	**0**	**0**	***3***	**0**	**0**	**4**	**8**	***12***	**51**	**42**	**23**	**9**	*125*
5:30 PM	**1**	**3**	**5**	**0**	***9***	**0**	**1**	**5**	**12**	***18***	**42**	**72**	**23**	**9**	***146***
5:45 PM	0	4	2	0	*6*	0	0	6	3	*9*	53	78	14	7	*152*
Count Total	1	21	15	0	*37*	6	6	37	81	*130*	391	494	149	73	*1,107*
Peak Hour	**1**	**9**	**8**	**0**	***18***	**3**	**3**	**22**	**45**	***73***	**171**	**225**	**76**	**36**	***508***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Cathcart St Eastbound				Cathcart St Westbound				Pacific Ave Northbound				Pacific 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	0	0	0	0	0	2	0	0	0	1	0	1	0	0	0	0	4	0
4:15 PM	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	4	0
4:30 PM	0	0	0	0	0	2	0	0	0	0	2	1	0	0	0	0	5	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**5**	18
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	15
5:15 PM	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	14
5:30 PM	**0**	**0**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**2**	**1**	**2**	**0**	**0**	**0**	**0**	**9**	**18**
5:45 PM	0	0	0	0	0	3	0	1	0	0	0	2	0	0	0	0	6	19
Count Total	0	0	1	0	0	19	1	1	0	3	3	9	0	0	0	0	37	0
Peak Hour	**0**	**0**	**1**	**0**	**0**	**9**	**0**	**0**	**0**	**2**	**1**	**5**	**0**	**0**	**0**	**0**	**18**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	Cathcart St Eastbound			Cathcart St Westbound			Pacific Ave Northbound			Pacific Ave Southbound			15-min Total	Rolling One Hour
	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	8	0	10	0
4:15 PM	1	1	0	1	1	0	0	2	0	1	11	0	18	0
4:30 PM	1	0	0	0	0	1	0	5	0	0	12	1	20	0
4:45 PM	**0**	**0**	**0**	**1**	**1**	**0**	**2**	**8**	**1**	**0**	**13**	**1**	**27**	75
5:00 PM	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**7**	**4**	**16**	81
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**7**	**1**	**12**	75
5:30 PM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**5**	**0**	**1**	**10**	**1**	**18**	**73**
5:45 PM	0	0	0	0	0	0	0	4	2	0	3	0	9	55
Count Total	3	2	1	3	2	1	2	32	3	2	71	8	130	0
Peak Hour	**1**	**1**	**1**	**2**	**1**	**0**	**2**	**19**	**1**	**1**	**37**	**7**	**73**	**0**

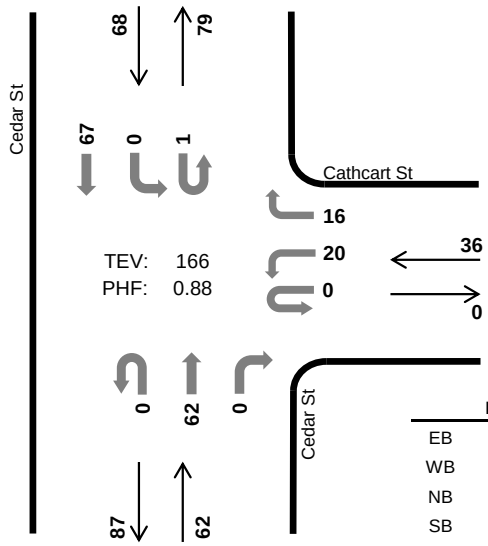
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Cedar St
Cathcart St

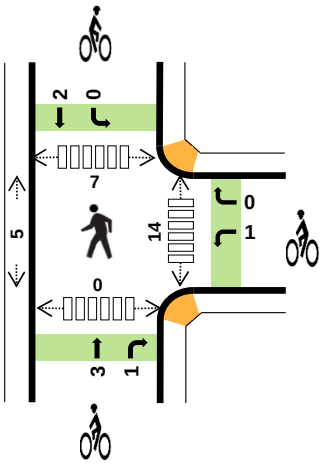
Date: 09/15/2022
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 8:00 AM to 9:00 AM

N

Peak Hour



	HV %:	PHF
EB	-	-
WB	5.6%	0.82
NB	6.5%	0.78
SB	8.8%	0.77
TOTAL	7.2%	0.88



Two-Hour Count Summaries

Interval Start	N/A Eastbound				Cathcart St Westbound				Cedar St Northbound				Cedar 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	0	0	0	0	5	0	0	0	0	5	0	0	0	3	0	13	0
7:15 AM	0	0	0	0	0	2	0	2	0	0	3	0	0	0	8	0	15	0
7:30 AM	0	0	0	0	0	1	0	4	0	0	14	0	0	0	11	0	30	0
7:45 AM	0	0	0	0	0	3	0	3	0	0	15	0	0	0	9	0	30	88
8:00 AM	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**2**	**0**	**0**	**12**	**0**	**0**	**0**	**12**	**0**	**30**	105
8:15 AM	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**7**	**0**	**0**	**14**	**0**	**1**	**0**	**21**	**0**	**47**	137
8:30 AM	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**1**	**0**	**0**	**16**	**0**	**0**	**0**	**18**	**0**	**43**	150
8:45 AM	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**6**	**0**	**0**	**20**	**0**	**0**	**0**	**16**	**0**	**46**	**166**
Count Total	0	0	0	0	0	31	0	25	0	0	99	0	1	0	98	0	254	0
Peak Hour All	**0**	**0**	**0**	**0**	**0**	**20**	**0**	**16**	**0**	**0**	**62**	**0**	**1**	**0**	**67**	**0**	**166**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**4**	**0**	**0**	**0**	**6**	**0**	**12**	**0**
Peak Hour HV%	**-**	**-**	**-**	**-**	**-**	**5%**	**-**	**6%**	**-**	**-**	**6%**	**-**	**0%**	**-**	**9%**	**-**	**7%**	**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	1	*3*	0	0	0	0	*0*	1	0	1	1	*3*
7:15 AM	0	0	0	1	*1*	0	0	0	0	*0*	1	0	0	0	*1*
7:30 AM	0	1	2	1	*4*	0	1	0	1	*2*	2	0	1	0	*3*
7:45 AM	0	0	0	1	*1*	0	0	1	4	*5*	2	1	1	0	*4*
8:00 AM	**0**	**0**	**3**	**1**	***4***	**0**	**0**	**1**	**0**	***1***	**4**	**2**	**5**	**0**	*11*
8:15 AM	**0**	**0**	**0**	**2**	***2***	**0**	**0**	**1**	**0**	***1***	**5**	**1**	**1**	**0**	*7*
8:30 AM	**0**	**2**	**0**	**1**	***3***	**0**	**0**	**2**	**0**	***2***	**2**	**1**	**1**	**0**	*4*
8:45 AM	**0**	**0**	**1**	**2**	***3***	**0**	**1**	**0**	**2**	***3***	**3**	**1**	**0**	**0**	***4***
Count Total	0	3	8	10	*21*	0	2	5	7	*14*	20	6	10	1	*37*
Peak Hr	**0**	**2**	**4**	**6**	***12***	**0**	**1**	**4**	**2**	***7***	**14**	**5**	**7**	**0**	***26***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	N/A				Cathcart St				Cedar St				Cedar 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	0	0	0	2	0	0	0	1	0	3	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	2	0	0	0	1	0	4	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	9
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**1**	**0**	**4**	10
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	11
8:30 AM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**3**	10
8:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**3**	**12**
Count Total	0	0	0	0	0	1	0	2	0	0	8	0	0	0	10	0	21	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**4**	**0**	**0**	**0**	**6**	**0**	**12**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	N/A			Cathcart St			Cedar St			Cedar 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	1	0	0	0	0	0	0	1	0	2	0
7:45 AM	0	0	0	0	0	0	0	1	0	0	4	0	5	7
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	8
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	9
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	9
8:45 AM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**3**	**7**
Count Total	0	0	0	2	0	0	0	4	1	0	7	0	14	0
Peak Hour	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**3**	**1**	**0**	**2**	**0**	**7**	**0**

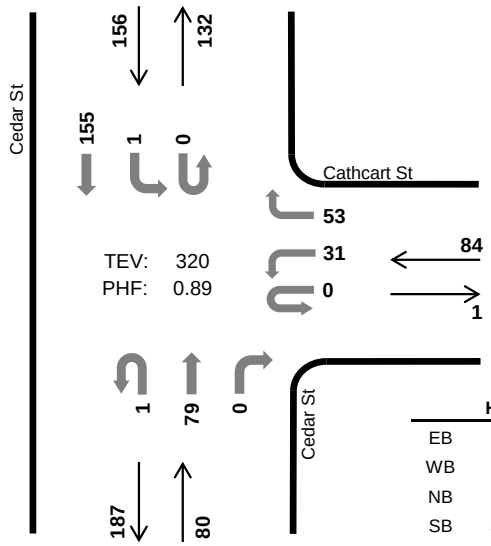
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Cedar St
Cathcart St

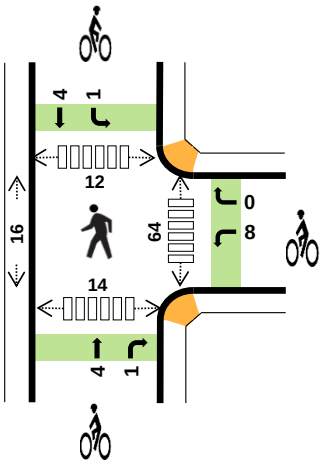
Date: 09/15/2022
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM

N

Peak Hour



	HV %:	PHF
EB	-	-
WB	1.2%	0.81
NB	1.3%	0.80
SB	3.2%	0.91
TOTAL	2.2%	0.89



Two-Hour Count Summaries

Interval Start	N/A Eastbound				Cathcart St Westbound				Cedar St Northbound				Cedar 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	0	0	0	0	6	0	11	0	0	21	0	0	0	29	0	67	0
4:15 PM	0	0	0	0	0	5	0	11	0	0	22	0	1	0	36	0	75	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**10**	**0**	**0**	**17**	**0**	**0**	**0**	**36**	**0**	**71**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**11**	**0**	**0**	**22**	**0**	**0**	**1**	**42**	**0**	**83**	296
5:00 PM	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**18**	**1**	**0**	**24**	**0**	**0**	**0**	**39**	**0**	**90**	319
5:15 PM	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**14**	**0**	**0**	**16**	**0**	**0**	**0**	**38**	**0**	**76**	**320**
5:30 PM	0	0	0	0	0	15	0	8	0	0	16	1	1	0	27	0	68	317
5:45 PM	0	0	0	0	0	4	0	11	0	0	19	0	2	0	37	0	73	307
Count Total	0	0	0	0	0	61	0	94	1	0	157	1	4	1	284	0	603	0
Peak Hour All	**0**	**0**	**0**	**0**	**0**	**31**	**0**	**53**	**1**	**0**	**79**	**0**	**0**	**1**	**155**	**0**	**320**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**5**	**0**	**7**	**0**
Peak Hour HV%	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**2%**	**0%**	**-**	**1%**	**-**	**-**	**0%**	**3%**	**-**	**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	0	1	1	0	*2*	0	0	0	3	*3*	14	7	3	0	*24*
4:15 PM	0	0	0	0	*0*	0	3	4	2	*9*	12	4	3	1	*20*
4:30 PM	**0**	**0**	**0**	**3**	***3***	**0**	**1**	**1**	**1**	***3***	**11**	**5**	**1**	**9**	*26*
4:45 PM	**0**	**1**	**0**	**0**	***1***	**0**	**2**	**2**	**2**	***6***	**14**	**4**	**1**	**1**	*20*
5:00 PM	**0**	**0**	**1**	**1**	***2***	**0**	**4**	**1**	**2**	***7***	**13**	**6**	**8**	**3**	*30*
5:15 PM	**0**	**0**	**0**	**1**	***1***	**0**	**1**	**1**	**0**	***2***	**26**	**1**	**2**	**1**	***30***
5:30 PM	0	1	2	1	*4*	0	1	1	5	*7*	22	3	9	0	*34*
5:45 PM	0	0	1	0	*1*	0	1	1	4	*6*	27	1	3	2	*33*
Count Total	0	3	5	6	*14*	0	13	11	19	*43*	139	31	30	17	*217*
Peak Hr	**0**	**1**	**1**	**5**	***7***	**0**	**8**	**5**	**5**	***18***	**64**	**16**	**12**	**14**	***106***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	N/A				Cathcart St				Cedar St				Cedar 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	1	0	0	0	0	0	2	0
4:15 PM	0	0	0	0	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**	**3**	**0**	**3**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	6
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**2**	6
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**7**
5:30 PM	0	0	0	0	0	0	0	1	0	0	2	0	0	0	1	0	4	8
5:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	8
Count Total	0	0	0	0	0	0	0	3	0	0	5	0	0	0	6	0	14	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**5**	**0**	**7**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	N/A			Cathcart St			Cedar St			Cedar 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	2	1	0	3	0
4:15 PM	0	0	0	3	0	0	0	3	1	1	1	0	9	0
4:30 PM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**3**	0
4:45 PM	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**1**	**0**	**2**	**0**	**6**	21
5:00 PM	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**0**	**7**	25
5:15 PM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**18**
5:30 PM	0	0	0	1	0	0	0	1	0	2	3	0	7	22
5:45 PM	0	0	0	1	0	0	0	1	0	0	4	0	6	22
Count Total	0	0	0	13	0	0	0	9	2	6	13	0	43	0
Peak Hour	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**4**	**1**	**1**	**4**	**0**	**18**	**0**

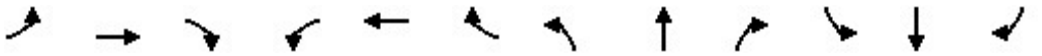
Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Appendix B

Analysis Worksheets for Existing (2022) Conditions

Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	113	201	206	63	464	24	267
v/c Ratio	0.35	0.67	0.66	0.04	0.24	0.05	0.24
Control Delay	37.8	44.5	44.1	0.1	9.2	11.1	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	44.5	44.1	0.1	9.2	11.1	10.8
Queue Length 50th (ft)	30	113	115	0	54	6	66
Queue Length 95th (ft)	45	168	170	0	80	17	111
Internal Link Dist (ft)	141		198		118		108
Turn Bay Length (ft)				150			
Base Capacity (vph)	827	493	507	1583	1932	529	1095
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.41	0.41	0.04	0.24	0.05	0.24

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	56	7	257	101	55	16	239	93	18	171	32
Future Volume (veh/h)	23	56	7	257	101	55	16	239	93	18	171	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	30	74	9	204	239	0	21	319	124	24	225	42
Peak Hour Factor	0.76	0.76	0.76	0.88	0.88	0.88	0.75	0.75	0.75	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	68	176	22	291	305		67	756	282	274	484	90
Arrive On Green	0.07	0.07	0.07	0.16	0.16	0.00	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	925	2412	304	1781	1870	1585	74	2395	892	947	1533	286
Grp Volume(v), veh/h	59	0	54	204	239	0	250	0	214	24	0	267
Grp Sat Flow(s),veh/h/ln	1824	0	1816	1781	1870	1585	1820	0	1541	947	0	1819
Q Serve(g_s), s	2.8	0.0	2.5	9.7	11.0	0.0	0.0	0.0	9.9	1.9	0.0	10.6
Cycle Q Clear(g_c), s	2.8	0.0	2.5	9.7	11.0	0.0	9.5	0.0	9.9	11.8	0.0	10.6
Prop In Lane	0.51		0.17	1.00		1.00	0.08		0.58	1.00		0.16
Lane Grp Cap(c), veh/h	133	0	133	291	305		618	0	486	274	0	574
V/C Ratio(X)	0.44	0.00	0.41	0.70	0.78		0.40	0.00	0.44	0.09	0.00	0.47
Avail Cap(c_a), veh/h	434	0	432	523	549		618	0	486	274	0	574
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	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.0	0.0	39.8	35.6	36.1	0.0	24.3	0.0	24.5	29.2	0.0	24.7
Incr Delay (d2), s/veh	2.3	0.0	2.0	3.1	4.4	0.0	2.0	0.0	2.9	0.6	0.0	2.7
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	1.3	0.0	1.2	4.4	5.3	0.0	4.4	0.0	3.9	0.5	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.3	0.0	41.8	38.7	40.5	0.0	26.3	0.0	27.4	29.8	0.0	27.4
LnGrp LOS	D	A	D	D	D		C	A	C	C	A	C
Approach Vol, veh/h		113			443	A		464			291	
Approach Delay, s/veh		42.0			39.7			26.8			27.6	
Approach LOS		D			D			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		11.2		33.0		19.3		33.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		21.4		28.4		26.4		28.4				
Max Q Clear Time (g_c+I1), s		4.8		13.8		13.0		11.9				
Green Ext Time (p_c), s		0.5		1.4		1.7		2.6				

Intersection Summary												
HCM 6th Ctrl Delay			32.6									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	48	21	25	391	488
v/c Ratio	0.25	0.11	0.12	0.25	0.18
Control Delay	27.8	12.7	25.9	2.9	3.5
Queue Delay	0.0	0.0	0.0	0.3	0.0
Total Delay	27.8	12.7	25.9	3.2	3.5
Queue Length 50th (ft)	17	0	8	35	18
Queue Length 95th (ft)	41	16	24	60	60
Internal Link Dist (ft)	279			238	121
Turn Bay Length (ft)		25	100		
Base Capacity (vph)	301	287	226	1545	2738
Starvation Cap Reductn	0	0	0	614	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.16	0.07	0.11	0.42	0.18

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	41	18	20	309	332	78
Future Volume (veh/h)	41	18	20	309	332	78
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	48	21	25	391	395	93
Peak Hour Factor	0.86	0.86	0.79	0.79	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	121	107	71	1239	1584	369
Arrive On Green	0.07	0.07	0.04	0.66	0.55	0.55
Sat Flow, veh/h	1781	1585	1781	1870	2954	667
Grp Volume(v), veh/h	48	21	25	391	244	244
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1777	1750
Q Serve(g_s), s	1.6	0.8	0.8	5.4	4.3	4.4
Cycle Q Clear(g_c), s	1.6	0.8	0.8	5.4	4.3	4.4
Prop In Lane	1.00	1.00	1.00			0.38
Lane Grp Cap(c), veh/h	121	107	71	1239	984	969
V/C Ratio(X)	0.40	0.20	0.35	0.32	0.25	0.25
Avail Cap(c_a), veh/h	304	270	228	1239	984	969
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	27.2	26.9	28.5	4.4	7.0	7.1
Incr Delay (d2), s/veh	0.8	0.3	1.1	0.7	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.3	0.4	1.6	1.5	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.0	27.2	29.6	5.1	7.6	7.7
LnGrp LOS	C	C	C	A	A	A
Approach Vol, veh/h	69			416	488	
Approach Delay, s/veh	27.8			6.5	7.7	
Approach LOS	C			A	A	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		8.7	6.6	39.4		46.0
Change Period (Y+Rc), s		4.6	* 4.2	5.6		5.6
Max Green Setting (Gmax), s		10.4	* 7.8	28.4		40.4
Max Q Clear Time (g_c+I1), s		3.6	2.8	6.4		7.4
Green Ext Time (p_c), s		0.0	0.0	3.0		2.6

Intersection Summary	
HCM 6th Ctrl Delay	8.6
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

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

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	11	71	71	48	17	10	44	34	0	0	0
Future Vol, veh/h	17	11	71	71	48	17	10	44	34	0	0	0
Peak Hour Factor	0.25	0.25	0.25	0.75	0.75	0.75	0.82	0.82	0.82	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	68	44	284	95	64	23	12	54	41	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	10.2	9.1	8.8
HCM LOS	B	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	11%	17%	52%
Vol Thru, %	50%	11%	35%
Vol Right, %	39%	72%	12%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	88	99	136
LT Vol	10	17	71
Through Vol	44	11	48
RT Vol	34	71	17
Lane Flow Rate	107	396	181
Geometry Grp	1	1	1
Degree of Util (X)	0.147	0.441	0.233
Departure Headway (Hd)	4.927	4.013	4.619
Convergence, Y/N	Yes	Yes	Yes
Cap	727	899	778
Service Time	2.969	2.035	2.649
HCM Lane V/C Ratio	0.147	0.44	0.233
HCM Control Delay	8.8	10.2	9.1
HCM Lane LOS	A	B	A
HCM 95th-tile Q	0.5	2.3	0.9

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	28	23	88	55	45	95
Future Vol, veh/h	28	23	88	55	45	95
Peak Hour Factor	0.82	0.82	0.78	0.78	0.77	0.77
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	28	113	71	58	123
Number of Lanes	1	0	1	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	7.9	8.1	8.5
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	55%	32%
Vol Thru, %	62%	0%	68%
Vol Right, %	38%	45%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	143	51	140
LT Vol	0	28	45
Through Vol	88	0	95
RT Vol	55	23	0
Lane Flow Rate	183	62	182
Geometry Grp	1	1	1
Degree of Util (X)	0.201	0.079	0.214
Departure Headway (Hd)	3.95	4.554	4.246
Convergence, Y/N	Yes	Yes	Yes
Cap	893	792	835
Service Time	2.044	2.554	2.328
HCM Lane V/C Ratio	0.205	0.078	0.218
HCM Control Delay	8.1	7.9	8.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.7	0.3	0.8

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	100	58	0	0	0
Future Vol, veh/h	0	100	58	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	122	71	0	0	0

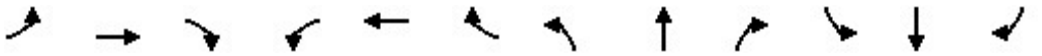
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	71	0	-	0	193	71
Stage 1	-	-	-	-	71	-
Stage 2	-	-	-	-	122	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1529	-	-	-	796	991
Stage 1	-	-	-	-	952	-
Stage 2	-	-	-	-	903	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1529	-	-	-	796	991
Mov Cap-2 Maneuver	-	-	-	-	796	-
Stage 1	-	-	-	-	952	-
Stage 2	-	-	-	-	903	-

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

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

Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	249	251	260	74	552	77	424
v/c Ratio	0.57	0.72	0.72	0.05	0.33	0.19	0.44
Control Delay	40.9	45.9	46.0	0.1	13.6	16.7	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	45.9	46.0	0.1	13.6	16.7	17.5
Queue Length 50th (ft)	69	149	155	0	83	23	146
Queue Length 95th (ft)	104	214	222	0	151	64	282
Internal Link Dist (ft)	141		198		118		108
Turn Bay Length (ft)				150			
Base Capacity (vph)	784	502	515	1583	1678	397	956
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.50	0.50	0.05	0.33	0.19	0.44

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	135	35	355	115	68	21	357	141	70	329	56
Future Volume (veh/h)	57	135	35	355	115	68	21	357	141	70	329	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	63	148	38	256	308	0	22	380	150	77	362	62
Peak Hour Factor	0.91	0.91	0.91	0.92	0.92	0.92	0.94	0.94	0.94	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	89	219	58	357	375		57	720	296	247	514	88
Arrive On Green	0.10	0.10	0.10	0.20	0.20	0.00	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	876	2147	571	1781	1870	1585	50	2179	895	874	1556	266
Grp Volume(v), veh/h	131	0	118	256	308	0	294	0	258	77	0	424
Grp Sat Flow(s),veh/h/ln	1827	0	1768	1781	1870	1585	1584	0	1541	874	0	1822
Q Serve(g_s), s	6.6	0.0	6.1	12.7	15.0	0.0	0.8	0.0	12.8	7.4	0.0	19.3
Cycle Q Clear(g_c), s	6.6	0.0	6.1	12.7	15.0	0.0	20.1	0.0	12.8	20.2	0.0	19.3
Prop In Lane	0.48		0.32	1.00		1.00	0.07		0.58	1.00		0.15
Lane Grp Cap(c), veh/h	186	0	180	357	375		564	0	509	247	0	602
V/C Ratio(X)	0.71	0.00	0.65	0.72	0.82		0.52	0.00	0.51	0.31	0.00	0.70
Avail Cap(c_a), veh/h	411	0	398	533	559		564	0	509	247	0	602
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	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.3	0.0	41.0	35.5	36.4	0.0	25.4	0.0	25.6	33.7	0.0	27.7
Incr Delay (d2), s/veh	4.8	0.0	4.0	2.7	6.1	0.0	3.4	0.0	3.6	3.3	0.0	6.8
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	3.2	0.0	2.8	5.7	7.3	0.0	5.7	0.0	5.1	1.8	0.0	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.1	0.0	45.0	38.2	42.4	0.0	28.8	0.0	29.2	37.0	0.0	34.5
LnGrp LOS	D	A	D	D	D		C	A	C	D	A	C
Approach Vol, veh/h		249			564	A		552			501	
Approach Delay, s/veh		45.6			40.5			28.9			34.9	
Approach LOS		D			D			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.3		36.0		23.6		36.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		21.4		31.4		28.4		31.4				
Max Q Clear Time (g_c+I1), s		8.6		22.2		17.0		22.1				
Green Ext Time (p_c), s		1.1		2.1		2.1		2.4				

Intersection Summary		
HCM 6th Ctrl Delay		36.3
HCM 6th LOS		D

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	115	73	64	489	732
v/c Ratio	0.49	0.27	0.32	0.35	0.32
Control Delay	32.9	9.5	31.7	4.7	7.7
Queue Delay	0.0	0.0	0.0	0.7	0.0
Total Delay	32.9	9.5	31.7	5.3	7.7
Queue Length 50th (ft)	44	0	24	59	73
Queue Length 95th (ft)	73	24	56	122	127
Internal Link Dist (ft)	279			238	121
Turn Bay Length (ft)		25	100		
Base Capacity (vph)	332	356	210	1417	2266
Starvation Cap Reductn	0	0	0	567	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.35	0.21	0.30	0.58	0.32

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	92	58	57	435	562	133
Future Volume (veh/h)	92	58	57	435	562	133
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	72	64	489	592	140
Peak Hour Factor	0.80	0.80	0.89	0.89	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	164	146	130	1230	1486	350
Arrive On Green	0.09	0.09	0.07	0.66	0.52	0.52
Sat Flow, veh/h	1781	1585	1781	1870	2947	673
Grp Volume(v), veh/h	115	72	64	489	368	364
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1777	1749
Q Serve(g_s), s	4.1	2.9	2.3	8.0	8.3	8.3
Cycle Q Clear(g_c), s	4.1	2.9	2.3	8.0	8.3	8.3
Prop In Lane	1.00	1.00	1.00			0.38
Lane Grp Cap(c), veh/h	164	146	130	1230	925	911
V/C Ratio(X)	0.70	0.49	0.49	0.40	0.40	0.40
Avail Cap(c_a), veh/h	335	298	211	1230	925	911
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	29.1	28.5	29.4	5.2	9.6	9.6
Incr Delay (d2), s/veh	2.0	1.0	1.1	1.0	1.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.1	1.0	2.6	3.1	3.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	31.1	29.5	30.5	6.2	10.8	10.9
LnGrp LOS	C	C	C	A	B	B
Approach Vol, veh/h	187			553	732	
Approach Delay, s/veh	30.5			9.0	10.9	
Approach LOS	C			A	B	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		10.7	9.0	40.0		49.0
Change Period (Y+Rc), s		4.6	* 4.2	5.6		5.6
Max Green Setting (Gmax), s		12.4	* 7.8	31.4		43.4
Max Q Clear Time (g_c+I1), s		6.1	4.3	10.3		10.0
Green Ext Time (p_c), s		0.1	0.0	4.7		3.5

Intersection Summary	
HCM 6th Ctrl Delay	12.7
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

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

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	31	71	70	109	46	34	91	83	0	0	0
Future Vol, veh/h	50	31	71	70	109	46	34	91	83	0	0	0
Peak Hour Factor	0.50	0.50	0.50	0.91	0.91	0.91	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	100	62	142	77	120	51	37	98	89	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	10.5	10.2	10.3
HCM LOS	B	B	B

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	16%	33%	31%
Vol Thru, %	44%	20%	48%
Vol Right, %	40%	47%	20%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	208	152	225
LT Vol	34	50	70
Through Vol	91	31	109
RT Vol	83	71	46
Lane Flow Rate	224	304	247
Geometry Grp	1	1	1
Degree of Util (X)	0.308	0.387	0.329
Departure Headway (Hd)	4.965	4.582	4.789
Convergence, Y/N	Yes	Yes	Yes
Cap	718	781	744
Service Time	3.037	2.642	2.854
HCM Lane V/C Ratio	0.312	0.389	0.332
HCM Control Delay	10.3	10.5	10.2
HCM Lane LOS	B	B	B
HCM 95th-tile Q	1.3	1.8	1.4

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	43	74	112	56	97	217
Future Vol, veh/h	43	74	112	56	97	217
Peak Hour Factor	0.81	0.81	0.80	0.80	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	53	91	140	70	107	238
Number of Lanes	1	0	1	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	9.1	9.1	11.2
HCM LOS	A	A	B

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	37%	31%
Vol Thru, %	67%	0%	69%
Vol Right, %	33%	63%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	168	117	314
LT Vol	0	43	97
Through Vol	112	0	217
RT Vol	56	74	0
Lane Flow Rate	210	144	345
Geometry Grp	1	1	1
Degree of Util (X)	0.261	0.195	0.439
Departure Headway (Hd)	4.479	4.864	4.583
Convergence, Y/N	Yes	Yes	Yes
Cap	800	735	783
Service Time	2.519	2.914	2.62
HCM Lane V/C Ratio	0.263	0.196	0.441
HCM Control Delay	9.1	9.1	11.2
HCM Lane LOS	A	A	B
HCM 95th-tile Q	1	0.7	2.3

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	153	143	0	0	0
Future Vol, veh/h	0	153	143	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	189	177	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	177	0	-	0	366	177
Stage 1	-	-	-	-	177	-
Stage 2	-	-	-	-	189	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1399	-	-	-	634	866
Stage 1	-	-	-	-	854	-
Stage 2	-	-	-	-	843	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1399	-	-	-	634	866
Mov Cap-2 Maneuver	-	-	-	-	634	-
Stage 1	-	-	-	-	854	-
Stage 2	-	-	-	-	843	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1399	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Appendix C

Analysis Worksheets for
Existing (2022) plus Proposed Project Conditions

Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	118	209	213	63	489	24	276
v/c Ratio	0.36	0.67	0.67	0.04	0.27	0.05	0.27
Control Delay	38.0	44.5	43.8	0.1	9.8	11.5	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	44.5	43.8	0.1	9.8	11.5	11.7
Queue Length 50th (ft)	31	117	120	0	57	6	70
Queue Length 95th (ft)	47	172	174	0	83	18	117
Internal Link Dist (ft)	141		198		118		108
Turn Bay Length (ft)				150			
Base Capacity (vph)	827	493	507	1583	1833	482	1039
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.42	0.42	0.04	0.27	0.05	0.27

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	58	7	270	101	55	16	245	106	18	178	32
Future Volume (veh/h)	25	58	7	270	101	55	16	245	106	18	178	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	33	76	9	211	249	0	21	327	141	24	234	42
Peak Hour Factor	0.76	0.76	0.76	0.88	0.88	0.88	0.75	0.75	0.75	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	72	175	21	301	316		65	733	303	263	487	87
Arrive On Green	0.07	0.07	0.07	0.17	0.17	0.00	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	973	2376	291	1781	1870	1585	70	2322	959	925	1543	277
Grp Volume(v), veh/h	62	0	56	211	249	0	264	0	225	24	0	276
Grp Sat Flow(s),veh/h/ln	1822	0	1818	1781	1870	1585	1822	0	1529	925	0	1820
Q Serve(g_s), s	2.9	0.0	2.7	10.1	11.5	0.0	0.0	0.0	10.6	1.9	0.0	11.0
Cycle Q Clear(g_c), s	2.9	0.0	2.7	10.1	11.5	0.0	10.1	0.0	10.6	12.5	0.0	11.0
Prop In Lane	0.53		0.16	1.00		1.00	0.08		0.63	1.00		0.15
Lane Grp Cap(c), veh/h	134	0	134	301	316		618	0	483	263	0	574
V/C Ratio(X)	0.46	0.00	0.42	0.70	0.79		0.43	0.00	0.47	0.09	0.00	0.48
Avail Cap(c_a), veh/h	433	0	432	523	549		618	0	483	263	0	574
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	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.0	0.0	39.8	35.3	35.9	0.0	24.5	0.0	24.7	29.7	0.0	24.8
Incr Delay (d2), s/veh	2.4	0.0	2.1	3.0	4.4	0.0	2.2	0.0	3.2	0.7	0.0	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	1.3	4.5	5.5	0.0	4.7	0.0	4.2	0.5	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.4	0.0	41.9	38.2	40.2	0.0	26.7	0.0	27.9	30.4	0.0	27.7
LnGrp LOS	D	A	D	D	D		C	A	C	C	A	C
Approach Vol, veh/h		118			460	A		489			300	
Approach Delay, s/veh		42.2			39.3			27.3			27.9	
Approach LOS		D			D			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		11.2		33.0		19.8		33.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		21.4		28.4		26.4		28.4				
Max Q Clear Time (g_c+I1), s		4.9		14.5		13.5		12.6				
Green Ext Time (p_c), s		0.5		1.4		1.7		2.7				

Intersection Summary												
HCM 6th Ctrl Delay			32.8									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	70	26	34	391	512
v/c Ratio	0.33	0.12	0.17	0.26	0.20
Control Delay	28.6	11.7	26.3	3.3	4.9
Queue Delay	0.0	0.0	0.0	0.3	0.0
Total Delay	28.6	11.7	26.3	3.6	4.9
Queue Length 50th (ft)	24	0	12	38	19
Queue Length 95th (ft)	52	17	29	66	65
Internal Link Dist (ft)	279			238	121
Turn Bay Length (ft)		25	100		
Base Capacity (vph)	301	291	226	1528	2569
Starvation Cap Reductn	0	0	0	594	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.09	0.15	0.42	0.20

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	60	22	27	309	332	98
Future Volume (veh/h)	60	22	27	309	332	98
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	70	26	34	391	395	117
Peak Hour Factor	0.86	0.86	0.79	0.79	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	141	125	90	1239	1472	431
Arrive On Green	0.08	0.08	0.05	0.66	0.54	0.54
Sat Flow, veh/h	1781	1585	1781	1870	2804	794
Grp Volume(v), veh/h	70	26	34	391	257	255
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1777	1727
Q Serve(g_s), s	2.3	0.9	1.1	5.4	4.7	4.8
Cycle Q Clear(g_c), s	2.3	0.9	1.1	5.4	4.7	4.8
Prop In Lane	1.00	1.00	1.00			0.46
Lane Grp Cap(c), veh/h	141	125	90	1239	965	938
V/C Ratio(X)	0.50	0.21	0.38	0.32	0.27	0.27
Avail Cap(c_a), veh/h	304	270	228	1239	965	938
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	26.9	26.3	28.0	4.4	7.4	7.5
Incr Delay (d2), s/veh	1.0	0.3	1.0	0.7	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.3	0.5	1.6	1.6	1.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.9	26.6	29.0	5.1	8.1	8.2
LnGrp LOS	C	C	C	A	A	A
Approach Vol, veh/h	96			425	512	
Approach Delay, s/veh	27.6			7.0	8.1	
Approach LOS	C			A	A	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		9.4	7.3	38.7		46.0
Change Period (Y+Rc), s		4.6	* 4.2	5.6		5.6
Max Green Setting (Gmax), s		10.4	* 7.8	28.4		40.4
Max Q Clear Time (g_c+I1), s		4.3	3.1	6.8		7.4
Green Ext Time (p_c), s		0.1	0.0	3.1		2.6

Intersection Summary	
HCM 6th Ctrl Delay	9.5
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

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

Intersection	
Intersection Delay, s/veh	11.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	34	73	71	74	17	14	44	34	0	0	0
Future Vol, veh/h	21	34	73	71	74	17	14	44	34	0	0	0
Peak Hour Factor	0.25	0.25	0.25	0.75	0.75	0.75	0.82	0.82	0.82	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	84	136	292	95	99	23	17	54	41	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	13.1	9.7	9.4
HCM LOS	B	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	15%	16%	44%
Vol Thru, %	48%	27%	46%
Vol Right, %	37%	57%	10%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	92	128	162
LT Vol	14	21	71
Through Vol	44	34	74
RT Vol	34	73	17
Lane Flow Rate	112	512	216
Geometry Grp	1	1	1
Degree of Util (X)	0.164	0.593	0.286
Departure Headway (Hd)	5.275	4.172	4.772
Convergence, Y/N	Yes	Yes	Yes
Cap	675	865	750
Service Time	3.341	2.205	2.818
HCM Lane V/C Ratio	0.166	0.592	0.288
HCM Control Delay	9.4	13.1	9.7
HCM Lane LOS	A	B	A
HCM 95th-tile Q	0.6	4	1.2

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	32	29	88	62	52	95
Future Vol, veh/h	32	29	88	62	52	95
Peak Hour Factor	0.82	0.82	0.78	0.78	0.77	0.77
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	39	35	113	79	68	123
Number of Lanes	1	0	1	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	8.1	8.2	8.7
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	52%	35%
Vol Thru, %	59%	0%	65%
Vol Right, %	41%	48%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	150	61	147
LT Vol	0	32	52
Through Vol	88	0	95
RT Vol	62	29	0
Lane Flow Rate	192	74	191
Geometry Grp	1	1	1
Degree of Util (X)	0.217	0.095	0.227
Departure Headway (Hd)	4.062	4.577	4.282
Convergence, Y/N	Yes	Yes	Yes
Cap	887	786	825
Service Time	2.071	2.586	2.382
HCM Lane V/C Ratio	0.216	0.094	0.232
HCM Control Delay	8.2	8.1	8.7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.8	0.3	0.9

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	100	58	30	29	10
Future Vol, veh/h	13	100	58	30	29	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	82	82	82	82	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	122	71	37	32	11

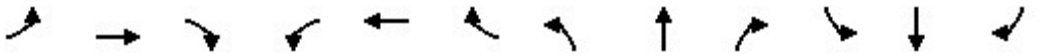
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	108	0	-	0	244	90
Stage 1	-	-	-	-	90	-
Stage 2	-	-	-	-	154	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1483	-	-	-	744	968
Stage 1	-	-	-	-	934	-
Stage 2	-	-	-	-	874	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1483	-	-	-	735	968
Mov Cap-2 Maneuver	-	-	-	-	735	-
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	874	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1483	-	-	-	783
HCM Lane V/C Ratio	0.011	-	-	-	0.054
HCM Control Delay (s)	7.5	0	-	-	9.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	264	275	279	74	625	77	446
v/c Ratio	0.58	0.74	0.73	0.05	0.38	0.23	0.48
Control Delay	41.2	45.6	44.9	0.1	14.6	18.9	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	45.6	44.9	0.1	14.6	18.9	19.5
Queue Length 50th (ft)	74	164	166	0	97	25	164
Queue Length 95th (ft)	110	229	230	0	177	70	317
Internal Link Dist (ft)	141		198		118		108
Turn Bay Length (ft)				150			
Base Capacity (vph)	783	504	517	1583	1626	340	923
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.55	0.54	0.05	0.38	0.23	0.48

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	142	35	395	115	68	21	378	189	70	349	56
Future Volume (veh/h)	64	142	35	395	115	68	21	378	189	70	349	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	70	156	38	277	338	0	22	402	201	77	384	62
Peak Hour Factor	0.91	0.91	0.91	0.92	0.92	0.92	0.94	0.94	0.94	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	98	228	58	385	405		53	640	348	217	519	84
Arrive On Green	0.11	0.11	0.11	0.22	0.22	0.00	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	918	2140	540	1781	1870	1585	40	1935	1054	816	1571	254
Grp Volume(v), veh/h	139	0	125	277	338	0	336	0	289	77	0	446
Grp Sat Flow(s),veh/h/ln	1824	0	1773	1781	1870	1585	1516	0	1512	816	0	1825
Q Serve(g_s), s	7.0	0.0	6.4	13.7	16.4	0.0	1.3	0.0	15.0	8.2	0.0	20.6
Cycle Q Clear(g_c), s	7.0	0.0	6.4	13.7	16.4	0.0	21.8	0.0	15.0	23.2	0.0	20.6
Prop In Lane	0.50		0.30	1.00		1.00	0.07		0.70	1.00		0.14
Lane Grp Cap(c), veh/h	195	0	189	385	405		541	0	500	217	0	603
V/C Ratio(X)	0.71	0.00	0.66	0.72	0.84		0.62	0.00	0.58	0.36	0.00	0.74
Avail Cap(c_a), veh/h	411	0	399	533	559		541	0	500	217	0	603
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	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.0	0.0	40.8	34.5	35.6	0.0	26.1	0.0	26.3	35.9	0.0	28.2
Incr Delay (d2), s/veh	4.8	0.0	3.9	2.9	7.7	0.0	5.3	0.0	4.8	4.5	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	0.0	3.0	6.1	8.2	0.0	6.9	0.0	5.9	1.9	0.0	10.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.8	0.0	44.7	37.4	43.3	0.0	31.4	0.0	31.1	40.4	0.0	36.1
LnGrp LOS	D	A	D	D	D		C	A	C	D	A	D
Approach Vol, veh/h		264			615	A		625			523	
Approach Delay, s/veh		45.3			40.7			31.3			36.7	
Approach LOS		D			D			C			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.7		36.0		25.2		36.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		21.4		31.4		28.4		31.4				
Max Q Clear Time (g_c+I1), s		9.0		25.2		18.4		23.8				
Green Ext Time (p_c), s		1.1		1.7		2.1		2.4				

Intersection Summary												
HCM 6th Ctrl Delay			37.4									
HCM 6th LOS			D									

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	201	90	87	489	794
v/c Ratio	0.71	0.29	0.44	0.38	0.42
Control Delay	39.8	13.6	34.6	5.9	9.8
Queue Delay	0.0	0.0	0.0	1.1	0.0
Total Delay	39.8	13.6	34.6	6.9	9.8
Queue Length 50th (ft)	76	10	33	74	90
Queue Length 95th (ft)	118	37	72	123	135
Internal Link Dist (ft)	279			238	121
Turn Bay Length (ft)		25	100		
Base Capacity (vph)	332	346	209	1274	1888
Starvation Cap Reductn	0	0	0	521	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.61	0.26	0.42	0.65	0.42

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	161	72	77	435	562	192
Future Volume (veh/h)	161	72	77	435	562	192
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	201	90	87	489	592	202
Peak Hour Factor	0.80	0.80	0.89	0.89	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	252	224	151	1230	1325	451
Arrive On Green	0.14	0.14	0.08	0.66	0.51	0.51
Sat Flow, veh/h	1781	1585	1781	1870	2695	886
Grp Volume(v), veh/h	201	90	87	489	404	390
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1777	1711
Q Serve(g_s), s	7.2	3.4	3.1	8.0	9.5	9.6
Cycle Q Clear(g_c), s	7.2	3.4	3.1	8.0	9.5	9.6
Prop In Lane	1.00	1.00	1.00			0.52
Lane Grp Cap(c), veh/h	252	224	151	1230	905	872
V/C Ratio(X)	0.80	0.40	0.58	0.40	0.45	0.45
Avail Cap(c_a), veh/h	335	298	211	1230	905	872
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	27.4	25.8	29.1	5.2	10.3	10.3
Incr Delay (d2), s/veh	7.0	0.4	1.3	1.0	1.6	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	1.2	1.3	2.6	3.6	3.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	34.4	26.2	30.4	6.2	11.9	12.0
LnGrp LOS	C	C	C	A	B	B
Approach Vol, veh/h	291			576	794	
Approach Delay, s/veh	31.9			9.9	11.9	
Approach LOS	C			A	B	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	13.9	9.8	39.2	49.0
Change Period (Y+Rc), s	4.6	* 4.2	5.6	5.6
Max Green Setting (Gmax), s	12.4	* 7.8	31.4	43.4
Max Q Clear Time (g_c+I1), s	9.2	5.1	11.6	10.0
Green Ext Time (p_c), s	0.2	0.0	5.1	3.5

Intersection Summary	
HCM 6th Ctrl Delay	14.7
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

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

Intersection	
Intersection Delay, s/veh	16
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	64	113	78	70	188	46	47	91	83	0	0	0
Future Vol, veh/h	64	113	78	70	188	46	47	91	83	0	0	0
Peak Hour Factor	0.50	0.50	0.50	0.91	0.91	0.91	0.93	0.93	0.93	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	128	226	156	77	207	51	51	98	89	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	19.4	13.4	12.5
HCM LOS	C	B	B

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	21%	25%	23%
Vol Thru, %	41%	44%	62%
Vol Right, %	38%	31%	15%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	221	255	304
LT Vol	47	64	70
Through Vol	91	113	188
RT Vol	83	78	46
Lane Flow Rate	238	510	334
Geometry Grp	1	1	1
Degree of Util (X)	0.384	0.71	0.493
Departure Headway (Hd)	5.812	5.011	5.312
Convergence, Y/N	Yes	Yes	Yes
Cap	618	719	678
Service Time	3.859	3.048	3.354
HCM Lane V/C Ratio	0.385	0.709	0.493
HCM Control Delay	12.5	19.4	13.4
HCM Lane LOS	B	C	B
HCM 95th-tile Q	1.8	6	2.7

Intersection	
Intersection Delay, s/veh	10.9
Intersection LOS	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	57	95	112	76	117	217
Future Vol, veh/h	57	95	112	76	117	217
Peak Hour Factor	0.81	0.81	0.80	0.80	0.91	0.91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	70	117	140	95	129	238
Number of Lanes	1	0	1	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	9.8	9.6	12.2
HCM LOS	A	A	B

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	38%	35%
Vol Thru, %	60%	0%	65%
Vol Right, %	40%	62%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	188	152	334
LT Vol	0	57	117
Through Vol	112	0	217
RT Vol	76	95	0
Lane Flow Rate	235	188	367
Geometry Grp	1	1	1
Degree of Util (X)	0.3	0.26	0.484
Departure Headway (Hd)	4.596	4.993	4.744
Convergence, Y/N	Yes	Yes	Yes
Cap	776	713	756
Service Time	2.659	3.063	2.801
HCM Lane V/C Ratio	0.303	0.264	0.485
HCM Control Delay	9.6	9.8	12.2
HCM Lane LOS	A	A	B
HCM 95th-tile Q	1.3	1	2.7

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	153	143	92	103	34
Future Vol, veh/h	40	153	143	92	103	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	49	189	177	114	112	37

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	291	0	-	0	521	234
Stage 1	-	-	-	-	234	-
Stage 2	-	-	-	-	287	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1271	-	-	-	516	805
Stage 1	-	-	-	-	805	-
Stage 2	-	-	-	-	762	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1271	-	-	-	494	805
Mov Cap-2 Maneuver	-	-	-	-	494	-
Stage 1	-	-	-	-	770	-
Stage 2	-	-	-	-	762	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	14
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1271	-	-	-	546
HCM Lane V/C Ratio	0.039	-	-	-	0.273
HCM Control Delay (s)	7.9	0	-	-	14
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1

Appendix D

Analysis Worksheets for
Cumulative (2030) plus Proposed Project Conditions

Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	424	456	470	86	957	210	809
v/c Ratio	0.69	0.87	0.87	0.05	1.27	2.23	1.19
Control Delay	41.3	49.8	48.5	0.1	160.4	611.1	131.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	49.8	48.5	0.1	160.4	611.1	131.5
Queue Length 50th (ft)	123	255	262	0	~390	~212	~640
Queue Length 95th (ft)	164	#470	#478	0	#516	#310	#870
Internal Link Dist (ft)	141		198		118		108
Turn Bay Length (ft)				150			
Base Capacity (vph)	785	536	556	1583	751	94	677
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.85	0.85	0.05	1.27	2.23	1.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	269	44	538	314	79	46	544	291	193	669	75
Future Volume (veh/h)	77	269	44	538	314	79	46	544	291	193	669	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	292	48	463	512	0	50	591	316	210	727	82
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	389	67	523	549		42	323	348	103	546	62
Arrive On Green	0.15	0.15	0.15	0.29	0.29	0.00	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	689	2510	430	1781	1870	1585	0	977	1054	615	1651	186
Grp Volume(v), veh/h	224	0	200	463	512	0	504	0	453	210	0	809
Grp Sat Flow(s),veh/h/ln	1836	0	1793	1781	1870	1585	519	0	1512	615	0	1837
Q Serve(g_s), s	11.1	0.0	10.1	23.6	25.3	0.0	0.0	0.0	27.2	4.2	0.0	31.4
Cycle Q Clear(g_c), s	11.1	0.0	10.1	23.6	25.3	0.0	31.4	0.0	27.2	31.4	0.0	31.4
Prop In Lane	0.38		0.24	1.00		1.00	0.10		0.70	1.00		0.10
Lane Grp Cap(c), veh/h	284	0	278	523	549		213	0	500	103	0	607
V/C Ratio(X)	0.79	0.00	0.72	0.89	0.93		2.36	0.00	0.91	2.04	0.00	1.33
Avail Cap(c_a), veh/h	414	0	404	533	559		213	0	500	103	0	607
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	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	38.6	0.0	38.2	32.0	32.6	0.0	29.9	0.0	30.4	47.0	0.0	31.8
Incr Delay (d2), s/veh	6.1	0.0	3.5	16.1	22.5	0.0	628.0	0.0	22.7	501.5	0.0	160.7
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	5.4	0.0	4.6	12.2	14.6	0.0	41.0	0.0	12.7	16.7	0.0	40.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.8	0.0	41.7	48.1	55.2	0.0	657.8	0.0	53.2	548.4	0.0	192.5
LnGrp LOS	D	A	D	D	E		F	A	D	F	A	F
Approach Vol, veh/h		424			975	A		957			1019	
Approach Delay, s/veh		43.3			51.8			371.4			265.8	
Approach LOS		D			D			F			F	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		19.3		36.0		32.5		36.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		21.4		31.4		28.4		31.4				
Max Q Clear Time (g_c+I1), s		13.1		33.4		27.3		33.4				
Green Ext Time (p_c), s		1.6		0.0		0.6		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	206.0	
HCM 6th LOS	F	

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	285	136	148	618	1284
v/c Ratio	0.89	0.40	1.03	0.50	0.71
Control Delay	57.0	17.4	120.7	7.4	13.1
Queue Delay	0.0	0.0	0.0	2.2	0.0
Total Delay	57.0	17.4	120.7	9.6	13.1
Queue Length 50th (ft)	112	25	~70	107	165
Queue Length 95th (ft)	#237	70	#171	172	236
Internal Link Dist (ft)	279			238	121
Turn Bay Length (ft)		25	100		
Base Capacity (vph)	332	349	144	1235	1814
Starvation Cap Reductn	0	0	0	459	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.86	0.39	1.03	0.80	0.71

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	262	125	136	569	805	376
Future Volume (veh/h)	262	125	136	569	805	376
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	285	136	148	618	875	409
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	331	294	135	1230	1211	561
Arrive On Green	0.19	0.19	0.08	0.66	0.51	0.51
Sat Flow, veh/h	1781	1585	1781	1870	2451	1093
Grp Volume(v), veh/h	285	136	148	618	658	626
Grp Sat Flow(s),veh/h/ln	1781	1585	1781	1870	1777	1674
Q Serve(g_s), s	10.2	5.0	5.0	11.2	18.9	19.2
Cycle Q Clear(g_c), s	10.2	5.0	5.0	11.2	18.9	19.2
Prop In Lane	1.00	1.00	1.00			0.65
Lane Grp Cap(c), veh/h	331	294	135	1230	913	860
V/C Ratio(X)	0.86	0.46	1.10	0.50	0.72	0.73
Avail Cap(c_a), veh/h	335	298	135	1230	913	860
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	26.1	23.9	30.5	5.8	12.4	12.5
Incr Delay (d2), s/veh	18.9	0.4	105.8	1.5	4.9	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	1.8	6.0	3.6	7.5	7.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	45.0	24.4	136.3	7.2	17.3	17.9
LnGrp LOS	D	C	F	A	B	B
Approach Vol, veh/h	421			766	1284	
Approach Delay, s/veh	38.3			32.2	17.6	
Approach LOS	D			C	B	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		16.8	9.5	39.5		49.0
Change Period (Y+Rc), s		4.6	4.5	5.6		5.6
Max Green Setting (Gmax), s		12.4	5.0	31.4		43.4
Max Q Clear Time (g_c+I1), s		12.2	7.0	21.2		13.2
Green Ext Time (p_c), s		0.0	0.0	6.1		4.7

Intersection Summary	
HCM 6th Ctrl Delay	25.6
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

Intersection	
Intersection Delay, s/veh	27
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	66	165	80	135	289	89	48	94	221	0	0	0
Future Vol, veh/h	66	165	80	135	289	89	48	94	221	0	0	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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	72	179	87	147	314	97	52	102	240	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	17	37.7	20.4
HCM LOS	C	E	C

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	13%	21%	26%
Vol Thru, %	26%	53%	56%
Vol Right, %	61%	26%	17%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	363	311	513
LT Vol	48	66	135
Through Vol	94	165	289
RT Vol	221	80	89
Lane Flow Rate	395	338	558
Geometry Grp	1	1	1
Degree of Util (X)	0.667	0.573	0.885
Departure Headway (Hd)	6.089	6.099	5.838
Convergence, Y/N	Yes	Yes	Yes
Cap	596	592	625
Service Time	4.089	4.124	3.838
HCM Lane V/C Ratio	0.663	0.571	0.893
HCM Control Delay	20.4	17	37.7
HCM Lane LOS	C	C	E
HCM 95th-tile Q	5	3.6	10.5

Intersection	
Intersection Delay, s/veh	16.2
Intersection LOS	C

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	104	176	151	96	152	292
Future Vol, veh/h	104	176	151	96	152	292
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	113	191	164	104	165	317
Number of Lanes	1	0	1	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	13.4	11.8	20.4
HCM LOS	B	B	C

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	37%	34%
Vol Thru, %	61%	0%	66%
Vol Right, %	39%	63%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	247	280	444
LT Vol	0	104	152
Through Vol	151	0	292
RT Vol	96	176	0
Lane Flow Rate	268	304	483
Geometry Grp	1	1	1
Degree of Util (X)	0.396	0.469	0.711
Departure Headway (Hd)	5.31	5.546	5.3
Convergence, Y/N	Yes	Yes	Yes
Cap	677	648	680
Service Time	3.357	3.596	3.338
HCM Lane V/C Ratio	0.396	0.469	0.71
HCM Control Delay	11.8	13.4	20.4
HCM Lane LOS	B	B	C
HCM 95th-tile Q	1.9	2.5	5.9

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	208	245	92	103	34
Future Vol, veh/h	40	208	245	92	103	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	226	266	100	112	37

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	366	0	-	0	628	316
Stage 1	-	-	-	-	316	-
Stage 2	-	-	-	-	312	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1193	-	-	-	447	724
Stage 1	-	-	-	-	739	-
Stage 2	-	-	-	-	742	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1193	-	-	-	429	724
Mov Cap-2 Maneuver	-	-	-	-	429	-
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	742	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	15.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1193	-	-	-	477
HCM Lane V/C Ratio	0.036	-	-	-	0.312
HCM Control Delay (s)	8.1	0	-	-	15.9
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.3

Appendix E

Cumulative Buildout Volumes
City of Santa Cruz Critical Intersections

Cumulative Buildout Volumes City of Santa Cruz Critical Intersections

3/19/2020

#	Intersection	NORTHE	NORTHE	NORTHE	SOUTHE	SOUTHE	SOUTHE	EASTBN	EASTBN	EASTBN	WESTBN	WESTBN	WESTBN	TOTAL	SOURCE
		LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT		
1	Western/High	240	0	94	0	0	0	0	755	164	61	448	0	1762	GP
2	Bay/High	174	508	55	515	882	68	178	380	275	113	309	269	3726	GP
3	Moore/High	24	7	17	45	21	41	9	880	35	24	661	21	1785	GP
4	Laurent/High	16	49	16	32	24	16	34	856	38	14	735	30	1860	GP
5	River/Potrero	90	766	86	272	737	103	129	10	76	197	9	255	2730	GP
6	River/Hwy. 1	99	454	726	1109	545	571	490	2350	86	561	1862	693	9546	Downtown Plan
7	River/Fern	410	1112	0	0	1564	43	1	0	106	0	0	0	3236	GP
8	River/Encinal	576	563	111	8	488	145	210	6	1047	117	6	15	3292	GP
9	Ocean-Hwy. 17/Plymouth	405	654	0	186	1101	239	71	208	495	127	97	55	3638	Ocean Ext
10	Market/Isbel-Goss	47	154	147	202	114	1	4	192	36	63	77	218	1255	GP
11	North Branciforte/Goss	220	70	95	3	113	61	40	312	295	33	74	1	1317	GP
12	Morrissey/Fairmount	53	794	28	53	862	108	160	89	127	24	27	82	2407	GP
13	Bay/Nobel-Iowa	100	717	98	42	1168	56	39	49	129	65	45	41	2549	GP
14	Bay/Escalona	27	811	41	145	1108	70	61	43	40	49	33	62	2490	GP
15	Bay/King	148	723	160	194	972	110	61	161	100	98	97	167	2991	GP
16	King/Laurel	171	69	60	36	62	10	20	430	154	67	262	15	1356	GP
17	Storey/King	0	0	0	551	0	53	26	380	0	0	278	88	1376	GP
18	Route 1/Shaffer Rd	62	0	80	0	0	0	0	690	51	38	536	0	1457	GP
19	Western/Hwy. 1	19	113	205	203	86	44	27	451	25	88	382	232	1875	GP
20	Swift/Mission	96	76	692	67	42	16	30	721	82	452	637	117	3028	GP
21	Miramar/Mission	111	31	164	103	15	137	95	1991	58	178	1428	89	4400	GP
22	Almar-Younglove/Mission	38	1	276	45	0	44	0	1808	24	219	1468	2	3925	GP
23	Bay/Mission	146	170	133	454	194	157	166	2178	109	222	1692	348	5969	190 W Cliff
24	Laurel/Mission	412	223	41	33	285	23	51	2259	487	77	1886	48	5825	GP
25	Walnut/Mission	125	151	59	78	146	85	145	2012	182	41	1791	41	4856	GP
26	King-Union/Mission	20	6	19	1161	1	4	0	2556	3	14	1987	217	5988	GP
27	Chestnut-Hwy. 1/Mission	138	332	46	71	497	1822	2436	1060	42	33	849	93	7419	Downtown Plan
28	N. Pacific/RIVER	226	31	59	44	26	17	20	659	382	32	713	51	2260	GP
29	Center/Mission	98	0	621	0	0	0	0	843	64	423	691	0	2740	GP
30	Front-Pacific/Mission-Water	0	0	0	64	371	221	263	1133	165	166	893	39	3315	Downtown Plan
31	River/Water	111	384	252	312	426	58	82	1166	62	204	958	346	4361	GP
32	Ocean/Kennan-Washburn	39	1540	52	59	1733	11	40	0	53	47	0	39	3613	GP
33	Ocean/Water	203	1359	96	522	1448	399	495	1578	162	168	1008	339	7777	Downtown Plan
34	Market/Water	0	0	0	507	0	189	223	1836	0	0	1170	128	4053	GP
35	N. Branciforte/Water	322	323	78	41	219	129	458	1273	470	101	930	50	4394	GP
36	Seabright/Water	60	0	49	0	0	0	0	1353	121	23	1021	0	2627	GP
37	Morrissey/Water-Soquel	19	127	30	293	233	75	535	1695	38	63	1489	36	4633	GP
38	Frederick/Soquel	146	0	433	0	0	0	0	1755	93	226	1416	0	4069	GP
39	Hagemann-Trevethan/Soquel	77	14	34	74	14	86	69	2092	53	22	1503	24	4062	GP
40	Park/Soquel	53	18	26	128	7	70	39	2147	30	12	1409	28	3967	GP
41	Capitola/Soquel	708	16	77	47	25	28	20	920	1149	79	672	25	3766	GP
42	La Fonda/Soquel	1	1	1	52	0	76	97	763	2	2	524	69	1588	GP
43	Bay/California Ave	269	0	47	0	0	0	0	656	204	64	608	0	1848	GP
44	Bay/California St	0	0	0	263	0	95	132	597	0	0	466	420	1973	GP
45	California/Laurel	35	224	326	23	169	29	11	828	30	168	752	20	2615	GP
46	Chestnut/Laurel	141	59	95	26	72	76	111	982	91	79	866	28	2626	GP
47	Center/Laurel	62	94	56	133	77	50	30	965	65	56	823	58	2469	GP
48	Cedar/Laurel	0	0	14	0	0	116	68	1195	26	0	898	94	2411	GP
49	Pacific/Laurel	59	96	44	97	59	63	162	1075	44	64	982	91	2836	508 Front TIA
50	Front/Laurel	4	228	254	202	366	262	165	996	29	227	830	195	3758	508 Front TIA
51	Front/Metro Center	14	661	20	0	833	17	14	0	19	6	0	11	1595	508 Front TIA
52	Front/Cathcart	116	569	0	0	805	317	193	0	111	0	0	0	2111	508 Front TIA
53	Front/Soquel	46	523	243	193	649	75	70	262	44	498	314	79	2996	508 Front TIA
54	Front/Cooper	79	504	0	0	668	78	148	0	148	0	0	0	1625	GP
55	River S./Soquel	0	0	0	445	0	161	0	602	0	0	619	178	2005	GP
56	Riverside-Dakota/Soquel (new	36	17	39	29	2	72	13	960	3	3	689	17	1880	GP
57	Ocean/Soquel	318	817	296	353	611	269	259	601	129	188	424	83	4348	GP
58	Branciforte/Soquel	56	143	79	58	170	116	163	843	112	101	579	34	2454	GP
59	Seabright/Soquel	217	45	223	90	128	70	32	1075	125	179	585	16	2785	GP
60	San Lorenzo/Laurel-Broadway	498	0	33	0	0	0	0	858	542	0	693	0	2624	GP
61	Ocean/Broadway	12	521	89	230	699	296	253	534	47	102	443	118	3344	GP
62	S. Branciforte/Broadway	70	51	9	115	77	104	75	725	64	8	433	75	1806	GP
63	Seabright/Broadway	171	242	51	10	269	112	184	394	253	47	183	13	1929	GP
64	Pacific Avenue/Center	18	166	549	34	162	214	0	0	0	444	172	62	1821	190 W Cliff
65	West Cliff/Bay	54	383	0	0	432	414	421	0	58	0	0	0	1762	190 W Cliff
66	Pacific/Beach	21	120	35	116	149	239	548	235	48	0	0	0	1511	190 W Cliff
67	Cliff/Beach	0	0	0	186	0	0	229	426	0	0	0	0	841	GP
68	Riverside/Beach	0	0	0	96	0	0	0	339	0	0	0	0	435	GP
69	Riverside/Second	0	0	0	43	164	117	0	0	5	2	7	0	338	GP

Appendix F

Analysis Worksheets for
Cumulative (2030) plus Proposed Project (Improved) Conditions

Lane Group	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Protected Phases	2	6	6			8		4
Permitted Phases				Free	8		4	
Minimum Initial (s)	7.0	7.0	7.0		7.0	7.0	7.0	7.0
Minimum Split (s)	20.0	20.0	20.0		20.0	20.0	20.0	20.0
Total Split (s)	20.0	39.0	39.0		71.0	71.0	71.0	71.0
Total Split (%)	15.4%	30.0%	30.0%		54.6%	54.6%	54.6%	54.6%
Maximum Green (s)	15.4	34.4	34.4		66.4	66.4	66.4	66.4
Yellow Time (s)	3.6	3.6	3.6		3.6	3.6	3.6	3.6
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0	1.0	1.0
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0
Minimum Gap (s)	2.0	2.0	2.0		2.0	2.0	2.0	2.0
Time Before Reduce (s)	5.0	7.0	7.0		7.0	7.0	7.0	7.0
Time To Reduce (s)	20.0	20.0	20.0		20.0	20.0	20.0	20.0
Recall Mode	None	Max	Max		None	None	None	None
Walk Time (s)	5.0	5.0	5.0		5.0	5.0	5.0	5.0
Flash Dont Walk (s)	16.0	16.0	16.0		16.0	16.0	14.0	14.0
Pedestrian Calls (#/hr)	0	0	0		0	0	0	0
90th %ile Green (s)	15.4	34.4	34.4		66.4	66.4	66.4	66.4
90th %ile Term Code	Max	MaxR	MaxR		Max	Max	Max	Max
70th %ile Green (s)	15.4	34.4	34.4		66.4	66.4	66.4	66.4
70th %ile Term Code	Max	MaxR	MaxR		Max	Max	Max	Max
50th %ile Green (s)	15.4	34.4	34.4		66.4	66.4	66.4	66.4
50th %ile Term Code	Max	MaxR	MaxR		Hold	Hold	Max	Max
30th %ile Green (s)	15.4	34.4	34.4		66.4	66.4	66.4	66.4
30th %ile Term Code	Max	MaxR	MaxR		Hold	Hold	Max	Max
10th %ile Green (s)	15.4	34.4	34.4		66.4	66.4	66.4	66.4
10th %ile Term Code	Max	MaxR	MaxR		Hold	Hold	Max	Max

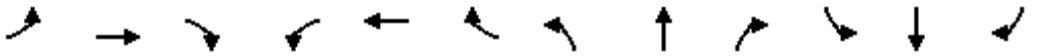
Intersection Summary
Cycle Length: 130
Actuated Cycle Length: 130
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 130
70th %ile Actuated Cycle: 130
50th %ile Actuated Cycle: 130
30th %ile Actuated Cycle: 130
10th %ile Actuated Cycle: 130

Lane Group	EBT	WBL	WBT	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	424	456	470	86	957	189	830
v/c Ratio	1.02	1.03	1.02	0.05	0.88	1.01	0.97
Control Delay	104.5	96.6	94.0	0.1	36.4	100.5	54.6
Queue Delay	0.0	0.0	0.0	0.0	3.9	0.0	0.0
Total Delay	104.5	96.6	94.0	0.1	40.3	100.5	54.6
Queue Length 50th (ft)	~195	~430	~441	0	338	~163	686
Queue Length 95th (ft)	#305	#653	#665	0	#494	#336	#997
Internal Link Dist (ft)	333		837		222		326
Turn Bay Length (ft)				150			
Base Capacity (vph)	415	444	461	1583	1085	188	859
Starvation Cap Reductn	0	0	0	0	75	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	1.03	1.02	0.05	0.95	1.01	0.97

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	269	44	538	314	79	46	544	291	193	669	75
Future Volume (veh/h)	77	269	44	538	314	79	46	544	291	193	669	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	292	48	463	512	0	50	591	316	210	727	82
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	82	297	51	471	495		50	637	535	240	843	95
Arrive On Green	0.12	0.12	0.12	0.26	0.26	0.00	0.51	0.51	0.51	0.51	0.51	0.51
Sat Flow, veh/h	689	2510	430	1781	1870	1585	39	1248	1048	615	1651	186
Grp Volume(v), veh/h	224	0	200	463	512	0	500	0	457	210	0	809
Grp Sat Flow(s),veh/h/ln	1836	0	1793	1781	1870	1585	821	0	1513	615	0	1837
Q Serve(g_s), s	15.4	0.0	14.4	33.6	34.4	0.0	16.3	0.0	27.5	38.9	0.0	50.1
Cycle Q Clear(g_c), s	15.4	0.0	14.4	33.6	34.4	0.0	66.4	0.0	27.5	66.4	0.0	50.1
Prop In Lane	0.38		0.24	1.00		1.00	0.10		0.69	1.00		0.10
Lane Grp Cap(c), veh/h	217	0	212	471	495		450	0	773	240	0	938
V/C Ratio(X)	1.03	0.00	0.94	0.98	1.03		1.11	0.00	0.59	0.88	0.00	0.86
Avail Cap(c_a), veh/h	217	0	212	471	495		450	0	773	240	0	938
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	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	57.3	0.0	56.9	47.5	47.8	0.0	32.7	0.0	22.3	47.9	0.0	27.8
Incr Delay (d2), s/veh	68.7	0.0	45.8	37.3	49.6	0.0	76.9	0.0	1.2	28.5	0.0	8.3
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	11.3	0.0	9.2	19.7	22.7	0.0	24.5	0.0	9.9	8.9	0.0	23.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	126.0	0.0	102.7	84.8	97.4	0.0	109.5	0.0	23.5	76.4	0.0	36.1
LnGrp LOS	F	A	F	F	F		F	A	C	E	A	D
Approach Vol, veh/h		424			975	A		957			1019	
Approach Delay, s/veh		115.0			91.4			68.5			44.4	
Approach LOS		F			F			E			D	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		20.0		71.0		39.0		71.0				
Change Period (Y+Rc), s		4.6		4.6		4.6		4.6				
Max Green Setting (Gmax), s		15.4		66.4		34.4		66.4				
Max Q Clear Time (g_c+I1), s		17.4		68.4		36.4		68.4				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			73.7									
HCM 6th LOS			E									

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Appendix G

Vehicle Miles Traveled (VMT) Analysis for
119 Lincoln Street – Downtown Library and Affordable Housing Project

PUBLIC WORKS DEPARTMENT
809 Center Street, Room 201, Santa Cruz CA 95060 • 831 420-5160 • Fax: 831 420-5161

November 17, 2022

Re: Vehicle Miles Traveled (VMT) Analysis for 119 Lincoln Street- Downtown Library and Affordable Housing Project

To: Brian Borguno, Development Manager
From: Claire Gallogly, AICP, Transportation Planner

This memorandum documents the results of a VMT analysis done for the proposed project at 119 Lincoln Street (the "proposed project", or "project"). Existing conditions include one parking lot with 134 spaces and one building located at 119 Lincoln Street The project proposes to construct a 38,086 square-foot library, a parking garage containing up to 400 spaces, 9,598 square-feet of commercial uses, a 1,905 square foot day care, and 124 low-income residential dwelling units.

This analysis uses the City of Santa Cruz SB743 Implementation Guidelines, adopted May 12, 2022.

The proposed project is located in a VMT Efficient Area based on the Santa Cruz City Residential Screening Map. This means that based on the VMT per capita threshold set by the City and County, the proposed project is located in an area that produces VMT per capita that is at least 15-percent below the Countywide average. Additionally, each of the project elements can use the screening criteria in Exhibit 2 of the City of Santa Cruz SB 743 Implementation Guidelines as follows:

- Projects near High Quality Transit: this project is within ½ mile of a High Quality Transit Stop as defined by California Public Resources Code section 21064.3
- Affordable Housing: this screening criteria covers the 124 units of affordable housing
- Local Essential Service: this screening criteria covers the day care and government offices uses (Library)
- Local Serving Retail: this screening criteria covers the 9,598 square feet of commercial uses, less than the threshold of 50,000 square feet

While the parking on site represents a net increase of up to 266 spaces (maximum 400 new, replacing 134 existing), because this parking is part of the public supply of parking and is not dedicated to these uses, the parking is analyzed as part of the overall shared public supply. In this case, the Parking District is projected to lose 448 spaces by 2030[1], but only projected to gain up to 400 with this project. This represents a net loss in the shared public supply of 48 spaces. This project does not add more parking than required by the City of Santa Cruz

Therefore, the VMT for this project is assumed to be less than significant in accordance with the adopted City of Santa Cruz guidelines.

[1] Lot 4 (-134), Lot 5 (-108), Lot 23 (-24), Lot 12 (-15), Lot 2 (-26), Lot 22 (-25), Lot 27 (-32), Lot 11 (-24), Lot 16 (-38), Lot 14 (-22)