March 21, 2022

Mr. Bill Spain
MIG, Inc.
800 Hearst Avenue
Berkeley, CA 94710

Draft Focused Transportation Study for the 70 Nielson Street Project

Dear Mr. Spain;

As requested, W-Trans has prepared a transportation analysis for the proposed self-storage facility in the City of Watsonville. The purpose of this analysis is to address potential circulation-related effects of the development on the surrounding streets and assess vehicle miles traveled.

Project Description

The proposed project is comprised of a new 149,796 square-foot self-storage facility to be located at 70 Nielson Street. The self-storage facility would have 1,072 units and a single caretaker apartment dwelling unit. The project site is an existing at-grade parking lot.

Study Area and Periods

The study area consists of the sections of Airport Boulevard and Nielson Street fronting the project site, the project access point, and the intersection of Airport Boulevard/Nielson Street.

Operating conditions during the weekday a.m. and p.m. peak periods were evaluated to capture the highest volumes on the local transportation network. The morning peak hour occurs between 7:00 and 9:00 a.m. and reflects conditions during the home-to-work commute, while the p.m. peak hour occurs between 4:00 and 6:00 p.m. and typically reflects the highest level of congestion during the homeward-bound commute.

Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is from December 11, 2016, to December 10, 2021.

The calculated collision rate for the study intersection was compared to the average collision rate for similar facilities statewide, as indicated in *2018 Collision Data on California State Highways*, California Department of Transportation (Caltrans). These average rates statewide are for intersections in the same environment (urban, suburban, or rural), with the same number of approaches (three or four), and the same controls (all-way stop, two-way stop, or traffic signal). With eight crashes reported during the 5-year study period, the study intersection had a collision rate of 0.23 collisions per million vehicles entering (c/mve), which is lower than the statewide average of 0.29 c/mve. The collision rate calculations are enclosed.

Trip Generation

The anticipated trip generation for the proposed project was estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 11th Edition, 2021. A review of available land use descriptions contained in the ITE manual identified the rates most closely aligned with the existing and proposed uses would be "Mini-Warehouse" (Land Use #151) and "Single-Family Detached Housing" (Land Use

#210). The standard rates for "Mini-Warehouse" includes all vehicle trips related to the operation of a personal storage facility for the maintenance, office operations and other services. The project is not anticipated to generate any pass-by trips or trip reductions resulting from nearby land use or transportation options. To provide a conservative analysis, trip reductions associated with the existing land use and any internal capture trips were not included.

The expected trip generation potential for the proposed project is indicated in Table 1. The proposed project is expected to generate an average of 227 new trips per day, including 15 trips during the a.m. peak hour and 24 trips during the p.m. peak hour; these new trips represent the increase in traffic associated with the project.

Table 1 – Trip Generation Summary

Land Use	Units	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Mini-Warehouse	149.796 ksf	1.45	217	0.09	14	8	6	0.15	23	11	12
Single Family Detached Housing	1 du	9.43	10	0.70	1	0	1	0.94	1	1	0
Total			**227**		**15**	**8**	**7**		**24**	**12**	**12**

Note: ksf = 1,000 square feet; du = dwelling unit

Trip Distribution

The pattern used to allocate new project trips to the street network was based on a review of turning movements at the study intersection and knowledge of local circulation patterns. The applied distribution assumptions are shown in Table 2.

Table 2 – Trip Distribution Assumptions

Route	Percent	Daily Trips	AM Trips	PM Trips
SR 1 to/from the west	50%	114	7	12
Freedom Boulevard to/from the north	45%	102	7	11
Residential uses to/from the east	5%	11	1	1
TOTAL	**100%**	**227**	**15**	**24**

Alternative Modes

Although the land use does not lend itself to trips other than by personal vehicle, it is still reasonable to assume that some pedestrian, bicycle, and/or use transit trips may be generated by the project.

Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. Sidewalks exist on both sides of Airport Boulevard, Nielson Street, and Hangar Way, effectively linking the project site to the surrounding pedestrian network. Signalized crosswalks are present on the north and east legs of the Airport Boulevard/Nielson Way intersection. Overhead streetlights exist along Airport Boulevard, Nielson Street, and Hangar Way. The existing facilities provide adequate pedestrian access and connections between the project site and surrounding residential neighborhoods and commercial uses.

Bicycle Facilities

There are existing Class II bike lanes along Airport Boulevard between Westgate Drive and Green Valley Road. According to the Watsonville *Trails & Bicycle Master Plan*, 2012, additional bike lanes are planned along Airport Boulevard between State Route (SR) 1 and Westgate Drive and along Loma Prieta Avenue between Airport Boulevard and South Green Valley Road. Cyclists would also be able to share the travel lanes with motorists on minor residential streets surrounding the site. As a result, adequate access for bicyclists is currently provided and would be improved upon completion of the planned facilities identified in the *Trails & Bicycle Master Plan*.

Transit

The nearest transit stops are located on Nielson Street fronting the project site. These stops are served by Santa Cruz METRO Routes 69 and 72. Route 69 provides connectivity between Santa Cruz and Downtown Watsonville and operates on weekdays from 6:40 a.m. to 4:40 p.m. and on weekends from 8:40 a.m. to 6:40 p.m. with one-hour headways. Route 72 operates on weekdays only from 6:55 a.m. to 5:55 p.m. with headways of one hour, providing connectivity between the northern and southern parts of the city. The existing transit facilities provide adequate connections between the project site and areas in and around the city.

Finding – Existing pedestrian, bicycle, and transit facilities provide adequate access to and from the project site for alternative modes of transportation.

Vehicle Miles Traveled (VMT)

Consideration was given to the project's potential generation of Vehicle Miles Traveled (VMT). Because the City of Watsonville has not yet adopted a standard of significance for evaluating VMT, guidance provided by the California Governor's Office of Planning and Research (OPR) in the publication *Technical Advisory on Evaluating Transportation Impacts in CEQA*, 2018, as well as recommendations provided by the Santa Cruz County Planning Department in the document titled "*Analyzing Vehicle Miles Traveled for CEQA Compliance*", updated in May 2021, were used. Guidance provided in these documents suggests that development projects consisting of multiple land uses may be evaluated based on the dominant use, which is the personal storage facility. This guidance also suggests that a personal storage facility may be considered local-serving if the demand for personal storage services in the area are constant and the addition of a new personal storage site would redistribute existing personal storage-based trips within and surrounding the City instead of creating new trips. The guidance states that local-serving projects are presumed to have a less-than-significant transportation impact on VMT since these kinds of land uses tend to shorten trips and reduce VMT.

For the purpose of this study, a quantitative approach was developed to evaluate the potential change in project-related VMT for the personal storage land use and determine whether the project would be local-serving. This method is summarized in the following steps.

1. Determine the average personal storage trip length in the immediate area by measuring the distance between existing personal storage facilities and a common point in Watsonville (in this case City Hall was used as the common point).

2. Measure the trip length from the project site to the common point (Watsonville City Hall).

3. If the project trip length is less than the average personal storage trip length for existing personal storage facilities, then the project may be presumed to reduce the average distance traveled for this type of use and is considered to have a less-than-significant VMT impact.

There are currently seven similar personal storage facilities in the study area vicinity within a ten-mile radius of Watsonville City Hall. The average distance between these facilities and the Watsonville City Hall is 4.9 miles. The distance between the project site and City Hall is 4.4 miles. Because the length of travel from the common

reference point to the project site is less than the average distance to other existing similar personal storage facilities, the project is presumed to have a local-serving effect and therefore have a less-than-significant VMT impact. A list of nearby existing personal storage facilities along with the corresponding distances between each location and Watsonville City Hall is provided in Table 3. A map illustrating the locations of each facility relative to the project site and City Hall is enclosed.

Table 3 – Vehicle Miles Traveled (VMT) Estimate

Site No.	Name	Street Address, City	Distance to City Hall (miles)
1.	StorageMart	6 Westgate Dr, Watsonville	2.4
2.	AAA Mini Storage	20 Westgate Dr, Watsonville	2.3
3.	Anbar Self Storage Moving Center	44 Ross Avenue, Freedom	3.0
4.	Extra Space Storage	1478 Freedom Blvd, Watsonville	1.6
5.	Rob Roy Storage	10405 Soquel Dr, Aptos	8.4
6.	Aptos Security Storage	7525 Freedom Blvd, Aptos	8.2
7.	Store More America Self Storage	9687 Soquel Dr, Aptos	8.5
Average of all facilities within 10 miles of City Hall			**4.9**
Project		70 Nielson St, Watsonville	4.4

Finding – The project is expected to have a less-than-significant impact in terms of the VMT it would generate.

Site Access and Circulation

The site would be accessed via two driveways on Nielson Street, which would provide full access to vehicle parking spaces. The western driveway would be located approximately 300 feet east of the crosswalk on the east leg of the intersection with Airport Boulevard. Nielson Street is a local street with a speed limit of 25 miles per hour (mph) and is approximately 40 feet wide with one travel lane in each direction; on-street parking is generally permitted on both sides of the street. Airport Boulevard has a posted speed limit of 45 mph and is approximately 60 feet wide with two travel lanes in each direction.

Sight Distance

Sight distances along Nielson Street at the two proposed driveways serving the project site were evaluated using sight distance criteria contained in the *Highway Design Manual* published by Caltrans. The recommended sight distance for driveways is based on stopping sight distance with approach travel speed used as the basis for determining the recommended sight distance.

For the posted 25-mph speed limit on Nielson Street, the minimum stopping sight distance needed is 150 feet. Based on a review of field conditions, sight lines to and from the western project driveway extend over 200 feet to the west and to the east, which is more than adequate for the posted speed limit. The sight lines from the eastern project driveway are more limited due to adjacent street parking on the north side of Nielson Street. Sight lines to and from the eastern driveway extend 170 feet to the west, which is adequate for the posted speed limit. However, sight lines from this driveway only extend 119 feet to the east which does not meet the minimum requirement of 150 feet. If the street parking directly adjacent to the driveway was prohibited, sight distances over the 150-foot minimum would be met. To maintain this sight distance, it is noted that any vegetation near the project's driveways should be trimmed to an appropriate height of three feet or less and trees trimmed so that nothing hangs below a height of seven feet from the surface of the roadway. Additionally, it is recommended that

on-street parking on Nielson Street be restricted within 25 feet (approximately one parking spot) on either side of the eastern driveway.

For a motorist traveling eastbound on Nielson Street intending to turn left into either project driveway, the stopping sight distance looking east along Nielson Street is also greater than 150 feet, providing adequate visibility to allow a following driver to observe and react to a vehicle that may stop in the roadway before making a left turn into the driveway.

Finding – Sight lines at the western project driveway are adequate to accommodate all turns into and out of the project site. However, sight lines at the eastern project driveway are inadequate due to vehicles parked in adjacent street parking.

Recommendations – To achieve a minimum sight distance of 150 feet at each driveway access point, it is recommended that on-street parking be restricted on Nielson Street for 25 feet on either side of the eastern driveway. Vegetation along the project frontage on Nielson Street should also be trimmed.

Emergency Access

Emergency response vehicles would be able to access the site via the driveways on Nielson Street as illustrated on the enclosed Fire Access Plan sheet. The proposed driveways and drive aisles would meet current City standards and so can be expected to accommodate the access requirements for both emergency and passenger vehicles. Since all roadway users must yield the right-of-way to emergency vehicles when using their sirens and lights, the added project-generated traffic is not expected to increase response times for emergency vehicles.

Finding – Emergency access is adequate since all driveways and internal roadways would be designed to accommodate emergency vehicles.

Intersection Level of Service Methodologies

Level of Service (LOS) is used to rate traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

The study intersection was analyzed using the signalized methodology published in the *Highway Capacity Manual* (HCM), Transportation Research Board, 6th Edition, 2018. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle. The signalized methodology is based on factors including traffic volumes, green time for each movement, phasing, whether the signals are coordinated or not, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For purposes of this study, delays were calculated using signal timing obtained from staff at the City of Watsonville.

Traffic Operation Standards

The City of Watsonville established a Level of Service (LOS) Standard of LOS D in the *Watsonville 2005 General Plan,* Chapter 10: Transportation and Circulation. This translates to an allowable average delay of 55 seconds or less for signalized intersections.

Short-Term Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the weekday a.m. and p.m. peak periods. This condition does not include project-generated traffic

volumes. Traffic volume data was collected on February 23, 2022, while local schools were operating with in-person learning and indicates that the study intersection is operating acceptably at LOS A. Upon the addition of project-related traffic to the existing volumes, the study intersection is expected to continue operating at LOS A. These results are summarized in Table 4. Copies of the traffic count data sheets and Level of Service calculations are enclosed.

Table 4 – Existing and Existing plus Project Peak Hour Intersection Levels of Service

Study Intersection	Existing Conditions				Existing plus Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Airport Blvd/Nielson St	5.0	A	5.8	A	5.2	A	6.1	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service.

Finding – The study intersection is expected to continue operating acceptably at the same Level of Service upon the addition of project-generated traffic to Existing Conditions as without it.

Future Conditions

Intersection turning movement volumes for the year 2040 were projected assuming an annual growth rate of one percent. Under these anticipated future volumes as well as upon the addition of project-related traffic, the study intersection is expected to operate at LOS A. These results are summarized in Table 4. The LOS calculations are enclosed.

Table 5 – Future and Future plus Project Peak Hour Intersection Levels of Service

Study Intersection	Future Conditions				Future plus Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Airport Blvd/Nielson St	5.0	A	6.1	A	5.2	A	6.3	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service.

Finding – The study intersection is expected to continue operating acceptably at the same Level of Service upon the addition of project-generated traffic to Future Conditions.

Conclusions and Recommendations

- The proposed project is expected to generate an average of 227 trips per day, including 15 trips during the weekday a.m. peak hour and 24 during the p.m. peak hour.
- Pedestrian, bicycle, and transit facilities are adequate to serve the project as proposed.
- The proposed project is expected to have a less-than-significant impact on vehicle miles traveled (VMT).
- The project's driveways and internal roadway should be designed to current City standards and are therefore expected to accommodate the access requirements for both emergency and passenger vehicles.

- Sight distances are adequate at the western driveway. To achieve a minimum sight distance of 150 feet at the eastern driveway, it is recommended that on-street parking be restricted for 25 feet on either side of the driveway and that vegetation along the project frontage on Nielson Street be trimmed.

- The intersection of Airport Boulevard/Nielson Street is expected to continue operating acceptably under all volume scenarios evaluated, both with and without the project.

Thank you for giving W-Trans the opportunity to provide these services. Please call if you have any questions.

Sincerely,

Siddharth Gangrade
Assistant Engineer

Kenny Jeong, PE
Senior Traffic Engineer

Mark Spencer, PE
Senior Principal

MES/kbj/sg/WAT005.L1

Enclosures: Collision Rates Worksheet, Storage Facilities Map, Fire Access Plan, Traffic Counts, Level of Service Calculations

Intersection Collision Rate Worksheet

70 Nielson Street

Intersection # 1: Airport Blvd & Nielson Rd
Date of Count: Wednesday, February 23, 2022

Number of Collisions: 8
Number of Injuries: 1
Number of Fatalities: 0
Average Daily Traffic (ADT): 19400
Start Date: December 11, 2016
End Date: December 10, 2021
Number of Years: 5

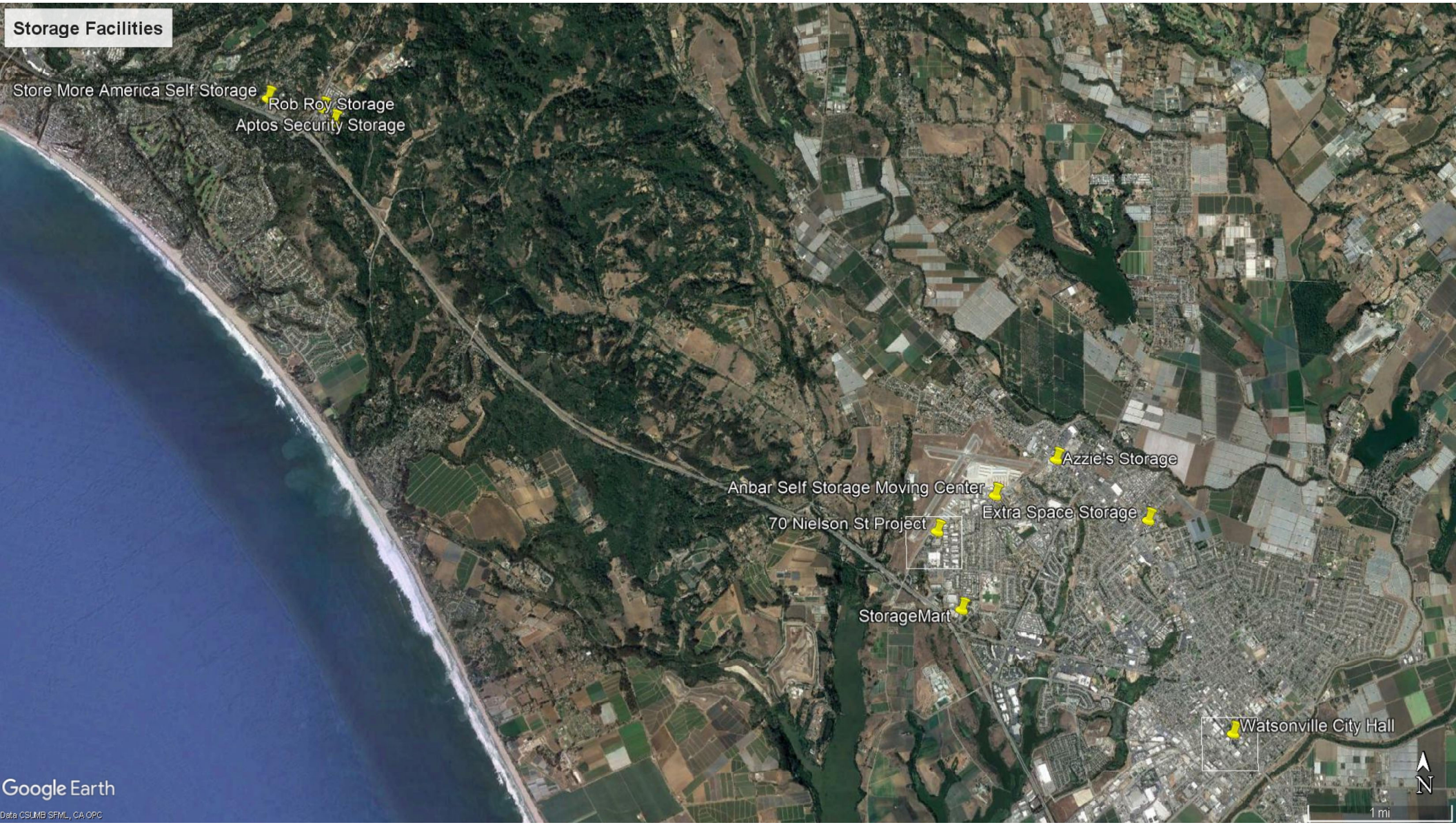
Intersection Type: Tee
Control Type: Signals
Area: Suburban

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

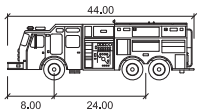
$$\text{Collision Rate} = \frac{8 \times 1{,}000{,}000}{19{,}400 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.23 c/mve**	**0.0%**	**12.5%**
Statewide Average*	**0.29 c/mve**	**0.5%**	**37.7%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2018 Collision Data on California State Highways, Caltrans


Storage Facilities
Store More America Self Storage
Rob Roy Storage
Aptos Security Storage
Azzie's Storage
Anbar Self Storage Moving Center
Extra Space Storage
70 Nielson St Project
StorageMart
Watsonville City Hall
Google Earth
Data CSUMB SFML, CA OPC
N
1 mi

FIRE ACCESS PLAN



Pumper Fire Truck

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 37.8

Revisions	Date

CROCKER'S LOCKERS SELF STORAGE

CUBIX CONSTRUCTION LLC
808 COBBLESTONE CT.
RIPON, CA 95338
209-892-1371
LICENSE NO.: 1061765

CROCKER'S LOCKERS
SELF STORAGE
70 NIELSON ST., WATSONVILLE, CA

FIRE ACCES PLAN

Drawn By	EJB/LTB
Date	5/7/21
Scale	1"=30'
File Name	Sht1fpvt
Planning File Numbers	
Sheet Number	7

Prepared by National Data & Surveying Services

Airport Blvd & Nielson St

Peak Hour Turning Movement Count

ID: 22-080060-001
City: Watsonville

Day: Wednesday
Date: 2/23/2022

PEAK HOURS		COUNT PERIODS
AM	07:15 AM - 08:15 AM	7:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:15 PM - 05:15 PM	4:00 PM - 06:00 PM

SOUTHBOUND (Airport Blvd)

	Right	Through	Left	U-Turn	Exit
AM	0	686	34	1	642
NOON	0	0	0	0	0
PM	0	740	19	0	711
(red)	0	0	0	0	

EASTBOUND (Nielson St)

	AM	NOON	PM	
Exit	0	0	0	
U-Turn	0	0	0	0
Left	0	0	0	0
Through	0	0	0	0
Right	0	0	0	0

WESTBOUND (Nielson St)

		PM	NOON	AM
Right	0	54	0	12
Through	0	0	0	0
Left	0	123	0	42
U-Turn	0	0	0	0
Exit		85	0	178

NORTHBOUND (Airport Blvd)

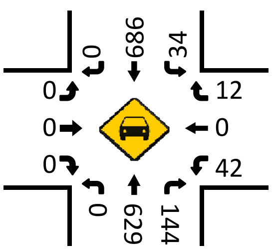
	Exit	U-Turn	Left	Through	Right
(red)		0	0	0	0
PM	863	0	0	657	66
NOON	0	0	0	0	0
AM	728	0	0	629	144

CONTROL

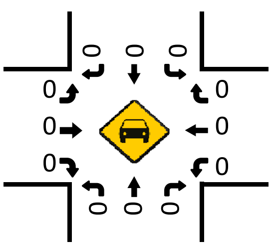
Signalized

	AM	NOON	PM
TEV	1548	0	1659
PHF	0.87		0.93

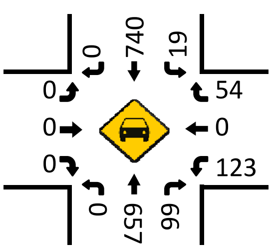
Totals (AM)



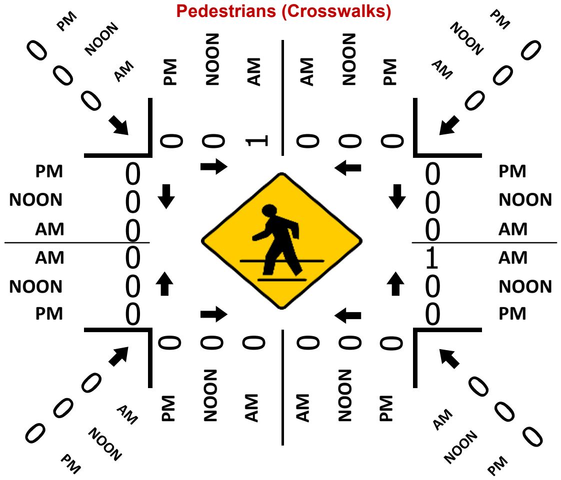
Totals (NOON)



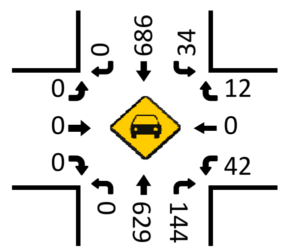
Totals (PM)



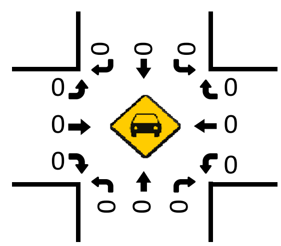
Pedestrians (Crosswalks)



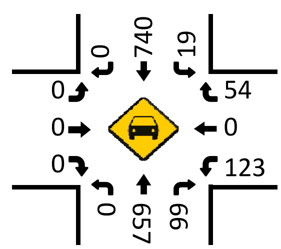
Totals (AM)



Totals (NOON)



Totals (PM)



HCM 6th Signalized Intersection Summary
1: Airport & Nielson 03/14/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	42	12	629	144	35	686
Future Volume (veh/h)	42	12	629	144	35	686
Initial Q (Qb), veh	2	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	4	723	151	40	746
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	114	101	1496	667	86	2198
Arrive On Green	0.06	0.06	0.42	0.42	0.05	0.62
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	48	4	723	151	40	746
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	0.7	0.1	3.9	1.6	0.6	2.7
Cycle Q Clear(g_c), s	0.7	0.1	3.9	1.6	0.6	2.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	114	101	1496	667	86	2198
V/C Ratio(X)	0.42	0.04	0.48	0.23	0.47	0.34
Avail Cap(c_a), veh/h	1071	953	4207	1876	1071	4207
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	12.1	11.8	5.7	5.0	12.5	2.5
Incr Delay (d2), s/veh	2.5	0.2	0.2	0.2	3.9	0.1
Initial Q Delay(d3),s/veh	3.8	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.4	0.2	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.4	11.9	5.9	5.2	16.4	2.6
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	52		874			786
Approach Delay, s/veh	17.9		5.8			3.3
Approach LOS	B		A			A
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	5.3	15.7		5.6		21.0
Change Period (Y+Rc), s	4.0	4.5		4.0		4.5
Max Green Setting (Gmax), s	16.0	31.5		16.0		31.5
Max Q Clear Time (g_c+I1), s	2.6	5.9		2.7		4.7
Green Ext Time (p_c), s	0.0	5.3		0.1		5.0
Intersection Summary						
HCM 6th Ctrl Delay			5.0			
HCM 6th LOS			A			

HCM 6th Signalized Intersection Summary
1: Airport & Nielson 03/14/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	123	54	657	66	19	740
Future Volume (veh/h)	123	54	657	66	19	740
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	132	21	706	60	20	804
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	223	198	1409	629	46	2016
Arrive On Green	0.13	0.13	0.40	0.40	0.03	0.57
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	132	21	706	60	20	804
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	1.9	0.3	4.1	0.7	0.3	3.5
Cycle Q Clear(g_c), s	1.9	0.3	4.1	0.7	0.3	3.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	223	198	1409	629	46	2016
V/C Ratio(X)	0.59	0.11	0.50	0.10	0.44	0.40
Avail Cap(c_a), veh/h	1032	918	4053	1808	1032	4053
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	11.4	10.7	6.3	5.2	13.3	3.3
Incr Delay (d2), s/veh	2.5	0.2	0.3	0.1	6.4	0.1
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	0.1	0.5	0.1	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.9	10.9	6.6	5.3	19.6	3.5
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	153		766			824
Approach Delay, s/veh	13.5		6.5			3.9
Approach LOS	B		A			A
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	4.7	15.5		7.5		20.2
Change Period (Y+Rc), s	4.0	4.5		4.0		4.5
Max Green Setting (Gmax), s	16.0	31.5		16.0		31.5
Max Q Clear Time (g_c+I1), s	2.3	6.1		3.9		5.5
Green Ext Time (p_c), s	0.0	4.8		0.3		5.4
Intersection Summary						
HCM 6th Ctrl Delay			5.8			
HCM 6th LOS			A			

HCM 6th Signalized Intersection Summary
1: Airport & Nielson

03/14/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	50	15	743	170	42	810
Future Volume (veh/h)	50	15	743	170	42	810
Initial Q (Qb), veh	2	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	50	6	743	157	42	810
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	120	107	1512	675	89	2209
Arrive On Green	0.06	0.06	0.43	0.43	0.05	0.62
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	50	6	743	157	42	810
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	0.7	0.1	4.1	1.7	0.6	3.0
Cycle Q Clear(g_c), s	0.7	0.1	4.1	1.7	0.6	3.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	120	107	1512	675	89	2209
V/C Ratio(X)	0.42	0.06	0.49	0.23	0.47	0.37
Avail Cap(c_a), veh/h	1048	933	4117	1836	1048	4117
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	12.3	11.9	5.7	5.0	12.7	2.6
Incr Delay (d2), s/veh	2.3	0.2	0.2	0.2	3.9	0.1
Initial Q Delay(d3),s/veh	3.4	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.4	0.2	0.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	18.0	12.2	6.0	5.2	16.5	2.7
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	56		900			852
Approach Delay, s/veh	17.4		5.9			3.4
Approach LOS	B		A			A
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	5.4	16.1		5.7		21.5
Change Period (Y+Rc), s	4.0	4.5		4.0		4.5
Max Green Setting (Gmax), s	16.0	31.5		16.0		31.5
Max Q Clear Time (g_c+I1), s	2.6	6.1		2.7		5.0
Green Ext Time (p_c), s	0.0	5.5		0.1		5.5
Intersection Summary						
HCM 6th Ctrl Delay			5.0			
HCM 6th LOS			A			

HCM 6th Signalized Intersection Summary
1: Airport & Nielson

03/14/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	146	64	776	78	23	874
Future Volume (veh/h)	146	64	776	78	23	874
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	146	30	776	68	23	874
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	231	206	1475	658	52	2063
Arrive On Green	0.13	0.13	0.41	0.41	0.03	0.58
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	146	30	776	68	23	874
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	2.3	0.5	4.8	0.8	0.4	4.0
Cycle Q Clear(g_c), s	2.3	0.5	4.8	0.8	0.4	4.0
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	231	206	1475	658	52	2063
V/C Ratio(X)	0.63	0.15	0.53	0.10	0.44	0.42
Avail Cap(c_a), veh/h	971	864	3816	1702	971	3816
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	12.1	11.3	6.4	5.2	14.0	3.4
Incr Delay (d2), s/veh	2.8	0.3	0.3	0.1	5.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.2	0.7	0.1	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.9	11.6	6.7	5.3	19.8	3.6
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	176		844			897
Approach Delay, s/veh	14.4		6.6			4.0
Approach LOS	B		A			A
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	4.9	16.7		7.8		21.5
Change Period (Y+Rc), s	4.0	4.5		4.0		4.5
Max Green Setting (Gmax), s	16.0	31.5		16.0		31.5
Max Q Clear Time (g_c+I1), s	2.4	6.8		4.3		6.0
Green Ext Time (p_c), s	0.0	5.4		0.4		6.0
Intersection Summary						
HCM 6th Ctrl Delay			6.1			
HCM 6th LOS			A			

HCM 6th Signalized Intersection Summary
1: Airport & Nielson

03/14/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	46	16	629	148	39	686
Future Volume (veh/h)	46	16	629	148	39	686
Initial Q (Qb), veh	2	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	53	8	723	155	45	746
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	128	114	1482	661	94	2191
Arrive On Green	0.07	0.07	0.42	0.42	0.05	0.62
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	53	8	723	155	45	746
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	0.8	0.1	4.0	1.7	0.7	2.7
Cycle Q Clear(g_c), s	0.8	0.1	4.0	1.7	0.7	2.7
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	128	114	1482	661	94	2191
V/C Ratio(X)	0.41	0.07	0.49	0.23	0.48	0.34
Avail Cap(c_a), veh/h	1050	935	4126	1840	1050	4126
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	12.2	11.8	5.9	5.2	12.6	2.6
Incr Delay (d2), s/veh	2.1	0.3	0.2	0.2	3.7	0.1
Initial Q Delay(d3),s/veh	3.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.4	0.2	0.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.3	12.1	6.1	5.4	16.3	2.7
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	61		878			791
Approach Delay, s/veh	16.6		6.0			3.4
Approach LOS	B		A			A
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	5.4	15.9		5.8		21.3
Change Period (Y+Rc), s	4.0	4.5		4.0		4.5
Max Green Setting (Gmax), s	16.0	31.5		16.0		31.5
Max Q Clear Time (g_c+I1), s	2.7	6.0		2.8		4.7
Green Ext Time (p_c), s	0.1	5.3		0.1		5.0
Intersection Summary						
HCM 6th Ctrl Delay			5.2			
HCM 6th LOS			A			

HCM 6th Signalized Intersection Summary
1: Airport & Nielson

03/14/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	129	60	657	72	25	740
Future Volume (veh/h)	129	60	657	72	25	740
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	139	28	706	66	27	796
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	231	205	1397	623	60	2022
Arrive On Green	0.13	0.13	0.39	0.39	0.03	0.57
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	139	28	706	66	27	796
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	2.1	0.4	4.2	0.7	0.4	3.5
Cycle Q Clear(g_c), s	2.1	0.4	4.2	0.7	0.4	3.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	231	205	1397	623	60	2022
V/C Ratio(X)	0.60	0.14	0.51	0.11	0.45	0.39
Avail Cap(c_a), veh/h	1011	900	3973	1772	1011	3973
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	11.6	10.9	6.5	5.4	13.4	3.4
Incr Delay (d2), s/veh	2.5	0.3	0.3	0.1	5.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.1	0.6	0.1	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.1	11.2	6.8	5.5	18.5	3.5
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	167		772			823
Approach Delay, s/veh	13.6		6.7			4.0
Approach LOS	B		A			A
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	5.0	15.6		7.6		20.5
Change Period (Y+Rc), s	4.0	4.5		4.0		4.5
Max Green Setting (Gmax), s	16.0	31.5		16.0		31.5
Max Q Clear Time (g_c+I1), s	2.4	6.2		4.1		5.5
Green Ext Time (p_c), s	0.0	4.8		0.3		5.4
Intersection Summary						
HCM 6th Ctrl Delay			6.1			
HCM 6th LOS			A			

HCM 6th Signalized Intersection Summary
1: Airport & Nielson 03/14/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	54	19	743	174	46	810
Future Volume (veh/h)	54	19	743	174	46	810
Initial Q (Qb), veh	2	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	54	10	743	161	46	810
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	132	118	1501	669	96	2203
Arrive On Green	0.07	0.07	0.42	0.42	0.05	0.62
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	54	10	743	161	46	810
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	0.8	0.2	4.2	1.8	0.7	3.1
Cycle Q Clear(g_c), s	0.8	0.2	4.2	1.8	0.7	3.1
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	132	118	1501	669	96	2203
V/C Ratio(X)	0.41	0.09	0.50	0.24	0.48	0.37
Avail Cap(c_a), veh/h	1031	918	4050	1807	1031	4050
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	12.4	12.0	5.9	5.2	12.8	2.6
Incr Delay (d2), s/veh	2.0	0.3	0.3	0.2	3.7	0.1
Initial Q Delay(d3),s/veh	2.8	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.1	0.5	0.2	0.3	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.2	12.3	6.2	5.4	16.5	2.7
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	64		904			856
Approach Delay, s/veh	16.4		6.0			3.5
Approach LOS	B		A			A
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	5.5	16.2		5.9		21.7
Change Period (Y+Rc), s	4.0	4.5		4.0		4.5
Max Green Setting (Gmax), s	16.0	31.5		16.0		31.5
Max Q Clear Time (g_c+I1), s	2.7	6.2		2.8		5.1
Green Ext Time (p_c), s	0.1	5.5		0.1		5.5
Intersection Summary						
HCM 6th Ctrl Delay			5.2			
HCM 6th LOS			A			

HCM 6th Signalized Intersection Summary
1: Airport & Nielson 03/14/2022

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	152	70	776	84	29	874
Future Volume (veh/h)	152	70	776	84	29	874
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	152	36	776	74	29	874
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	236	210	1465	654	64	2070
Arrive On Green	0.13	0.13	0.41	0.41	0.04	0.58
Sat Flow, veh/h	1781	1585	3647	1585	1781	3647
Grp Volume(v), veh/h	152	36	776	74	29	874
Grp Sat Flow(s),veh/h/ln	1781	1585	1777	1585	1781	1777
Q Serve(g_s), s	2.4	0.6	4.9	0.9	0.5	4.1
Cycle Q Clear(g_c), s	2.4	0.6	4.9	0.9	0.5	4.1
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	236	210	1465	654	64	2070
V/C Ratio(X)	0.64	0.17	0.53	0.11	0.45	0.42
Avail Cap(c_a), veh/h	956	851	3756	1675	956	3756
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	12.3	11.5	6.6	5.4	14.1	3.4
Incr Delay (d2), s/veh	2.9	0.4	0.3	0.1	5.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.2	0.7	0.1	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.2	11.9	6.9	5.5	19.1	3.6
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	188		850			903
Approach Delay, s/veh	14.6		6.8			4.1
Approach LOS	B		A			A
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	5.1	16.8		7.9		21.9
Change Period (Y+Rc), s	4.0	4.5		4.0		4.5
Max Green Setting (Gmax), s	16.0	31.5		16.0		31.5
Max Q Clear Time (g_c+I1), s	2.5	6.9		4.4		6.1
Green Ext Time (p_c), s	0.0	5.4		0.4		6.0
Intersection Summary						
HCM 6th Ctrl Delay			6.3			
HCM 6th LOS			A			