MEMORANDUM

To: Lillian Tsang, City of Sunnyvale
Ralph Garcia, City of Sunnyvale

Cc: Dennis Ng, City of Sunnyvale

From: Swathi Korpu, AECOM
Ravi Puttagunta, AECOM
Nichole Seow, AECOM

Date: December 5, 2019

Re: Child Care Center (755 S Bernardo Avenue) Project Appeal – Traffic Technical Memorandum

The purpose of this technical memorandum is to address the following four items that were brought up in the appeal letter dated 10/31/2019.

I. Blind Corners (or Sight Distance) (page 5)
II. Cross-Driveway Intersections (page 5)
III. Traffic Generation (or Trip Generation) (page 6)
IV. Children Foot Traffic (page 6)

The memo also provides response to the traffic letters recommendations and comments (for S Bernardo Avenue/Brookfield Avenue intersection) dated 12/5/2019.

BACKGROUND

The project involves conversion of a currently vacant building located at 755 S Bernardo Avenue in City of Sunnyvale to a childcare/preschool for up to 120 children with 24 teachers and staff. The project will provide an emergency vehicle access along S Bernardo Avenue that is closed off to regular traffic through the use of removable bollards. The main access to the proposed project will be along Brookfield Avenue.

A total of six intersections, listed below, were selected as study locations in consultation with the City of Sunnyvale staff. The acceptable Level of Service (LOS) standard for the City of Sunnyvale study intersections is D or better.

1. S Knickerbocker Dr / Brookfield Ave*
2. S Bernardo Ave / W ECR
3. S Bernardo Ave / Blair Ave*
4. S Bernardo Ave / Brookfield Ave*
5. S Bernardo Ave / Heatherstone Way
6. S Bernardo Ave / W Knickerbocker Dr*

*unsignalized intersection

Project Vicinity and Study intersections are presented in Attachment A.

Existing intersection data collection and field observations during the peak hours were conducted by AECOM in May 2018. Traffic conditions along the roads surrounding the project site were observed to be generally between light to

moderate, except for W El Camino Real (ECR). The results of the LOS calculations indicate that all of the study intersections operate at acceptable levels of service under Existing Conditions. No parking issues were observed in the project vicinity during both the AM and PM peak hours.

Per the scope set forth by City of Sunnyvale for this Project TOA, AECOM evaluated the Existing and Background conditions with and without the project and identified no significant impacts on traffic, pedestrian/bike, transit, parking, queuing, site access (driveways) and site circulation.

APPEAL IDENTIFIED ISSUES

Per the City's request, the following items identified in the appeal package were evaluated.

I. Blind Corners at S Bernardo Ave/Brookfield Ave intersection

Based on our field observations, traffic volume at the S. Bernardo Avenue / Brookfield Avenue intersection is between low to moderate. Currently there are sufficient gaps to make the eastbound left turns from Brookfield Avenue without having to wait for a longer time. The adjacent signalized intersections at W. ECR / S. Bernardo Avenue and Heatherstone Way / S. Bernardo Avenue would create enough gaps for the Brookfield Avenue left-turn volumes. The expected level of service (LOS) of the unsignalized intersection[1] would be at 'B' and 'C' (Background plus Project AM and PM respectively), which are considered satisfactory.

The main project access on Brookfield Avenue is a full access driveway. Driver who prefers not to make left turns out of the site as well as onto NB Bernardo (towards ECR), have the option of making right turns out onto Brookfield Avenue and subsequently making another right-turn at S Knickerbocker Drive to get to ECR. From an operational point of view, it is not necessary to restrict project traffic at the intersection of S. Bernardo Avenue / Brookfield Avenue as suggested by the author of the appeal letter.

It was observed in the field that the drivers would inch out of the STOP bar to wait for a gap in order to complete the left turn from Brookfield Avenue to NB Bernardo Avenue. Inching out would improve sight visibility in general.

The ability to inch out is directly related to the number of pedestrians crossing the crosswalk along Bernardo Avenue. From the collected counts, it was observed that 41 pedestrians were crossing in the AM peak hour and 14 pedestrians were crossing in the PM peak hour. Given fairly low pedestrian volumes, the conflicts are expected to be minimal.

The corner sight distance for EB left turn at the S. Bernardo Avenue / Brookfield Avenue intersection was further evaluated using Caltrans Highway Design Manual (HDM, 6th Edition, Index 405.1).

"The minimum corner sight distance (feet) should be determined by the equation: 1.47VmTg, where Vm is the design speed (mph) of the major road and Tg is the time gap (seconds) for the minor road vehicle to enter the major road."

The posted speed limit on S. Bernardo Avenue is 30 mph and that for Brookfield Avenue is 25 mph. Using 7.5 seconds as the gap time for left-turn from Stop (Table 405.1A of HDM), the required corner sight distance is calculated to be 331 feet (not 430 feet as identified in the appeal letter). In addition, street parking is allowed along the west side of S Bernardo Avenue south of Brookfield Avenue. Therefore, the sight distance evaluation considered both with and without parking scenarios.

[1] The unsignalized intersection LOS is based on worst delay of the side street or stop control approach.

The corner sight distance exhibits showing the clear sight triangles (indicated in green) with and without parking along S. Bernardo Avenue are provided in Attachment B. Attachment C includes the intersection turning movement vehicle/ped/bike volume counts collected during the AM and PM peak hours.

The available sight distance is 190' with parking and 205' without parking (indicated in red) along S. Bernardo Avenue. It can be seen from the exhibits that drivers have to inch out farther when there is street parking compared to the without parking scenario. The City of Sunnyvale can consider prohibiting parking along the west side of S Bernardo Avenue between Brookfield Avenue and Parkington Avenue to improve the sight distance.

Another option to facilitate the left turn movements from Brookfield Avenue is to provide a refuge area along S Bernardo Avenue that allows the storage of up to 2 cars. This will allow the left turning traffic to cross one direction of traffic at a time and help reduce the wait time and anxiety of drivers.

A third option is to narrow and realign S Bernardo Avenue to improve the sight distance at this location.

As recommended in Figure 1 of the letter dated 12/5/2019, the island improvements would help address the sight distance issues. However, the bus stop located on the west side of S Bernardo Avenue south of this intersection would have to be relocated, and the Class II bike lane along west side of S Bernardo venue would be affected.

It is to be noted that AECOM has provided an improvement concept plan previously for the west crosswalk at S. Bernardo Avenue / Brookfield Avenue intersection. The intent is to tighten the intersection for southbound right turn traffic and to also shorten the crosswalk length to help enhance the safety for crossing pedestrians.

AECOM reviewed the accident data provided by the City for the last 5 years (9/1/2014 to 8/31/2019) at this intersection. The accident data revealed no significant issues at this intersection. There was one injury accident reported in January 2017 which involved a pedestrian and a passenger car. This pedestrian / vehicle collision occurred as a result of the pedestrian right of way violation at the west crosswalk by the car making a left from S. Bernardo Avenue. Also, this accident happened in the 'dark- raining' condition.

The concern identified in the appeal letter dated 12/5/2019 is reasonable. However, removing the pork chop island and bringing all the movements to one point at the intersection (complete streets), in general would improve the safety and operations of the intersection.

II. Cross-Driveway Intersections Blind Corner

The proposed project would not impede the sight-distance of other driveways along S Bernardo Avenue as it is not adding any additional trips to the other driveways. Any problems/concerns along these driveways is pre-existing, not a result of the proposed project. Further detail evaluation is beyond the project's responsibility.

A possible improvement would be to remove the parallel parking on the east side of S Bernardo Avenue between Brookfield Avenue and Blair Avenue, and push the sidewalk and curb toward the bike lane along Brookfield Avenue. This would bring the driveway access closer to S Bernardo Avenue and provide better visibility.

III Traffic Generation

Project generated trips were estimated using average vehicle trip rates for Day Care Center (Land Use Code: 565) published by the Institute of Transportation Engineers (ITE, 10th Edition). The sites surveys included similar facilities in California and these trip rates were based on 75 studies.

Using ITE Trip Generation is an accepted methodology by the industry and local agencies such as Cities and Counties. The analysis is focused on the peak one-hour during the commute peak period. Not all staff and children are expected to arrive at the school within that peak hour. In fact, the trip generations were determined based on the number of enrolled students because staff are expected to be arrive or leave the premise before or after the children respectively.

The proposed project is estimated to generate 94 AM peak hour vehicle trips (50 inbound trips and 44 outbound trips) and 95 PM peak hour vehicle trips (45 inbound trips and 50 outbound trips).

IV Children Foot Traffic

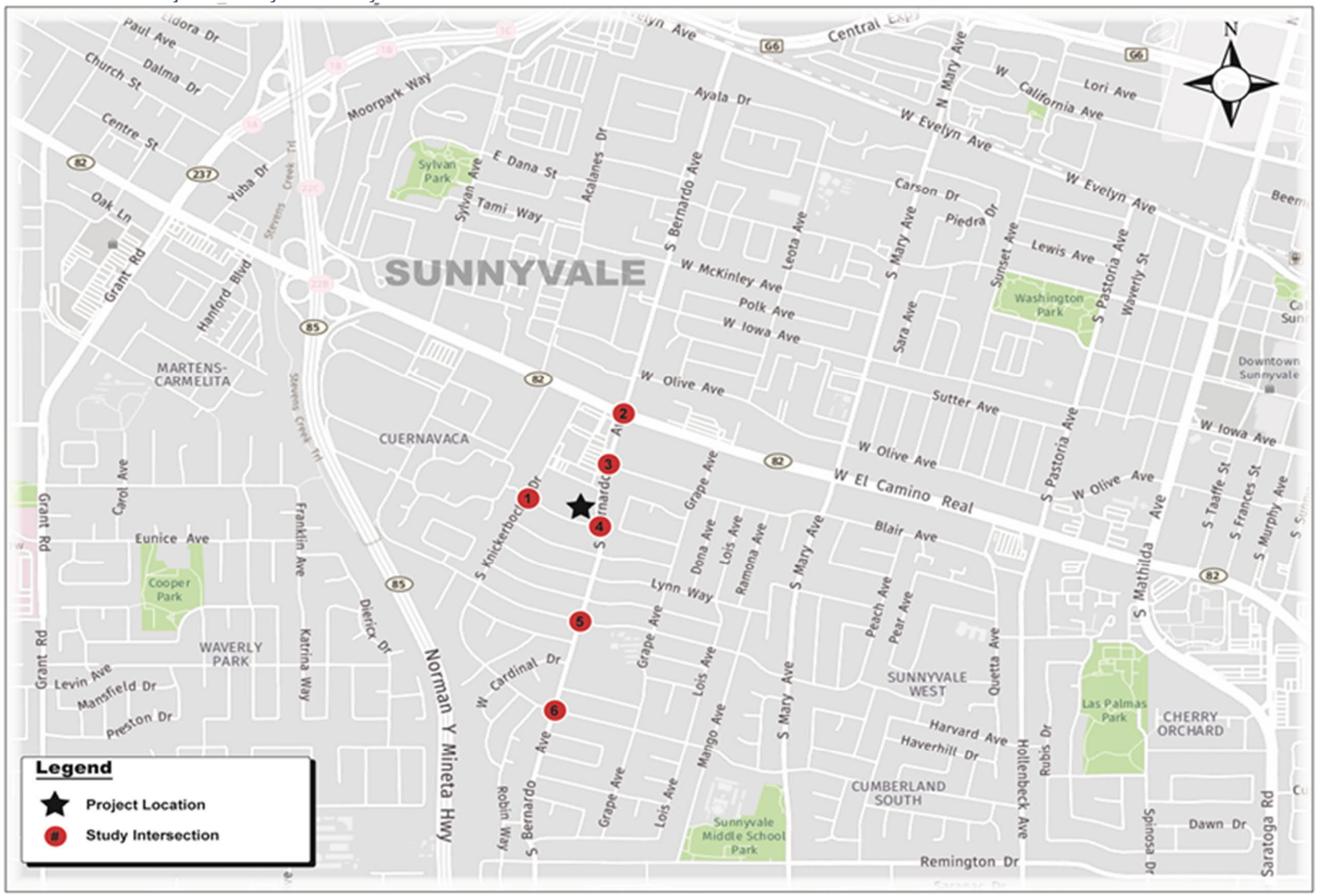
The analysis was conducted with the understanding that this facility will be a childcare/pre-school, with children up to 5 years of age. Therefore, no afterschool programs that cater to potential elementary school students from the nearby Cherry Chase Elementary School were taken into consideration. Given the age of the children to be enrolled in this facility, it is unlikely that they will be a significant amount of foot traffic.

Attachment A: Project Vicinity and Study Intersections

Attachment B: S Bernardo Avenue/Brookfield Avenue intersection: Corner sight distance exhibits

Attachment C: S Bernardo Avenue/Brookfield Avenue intersection: Turning movement vehicle/ped/bike volume

Attachment A: Project Vicinity and Study intersections

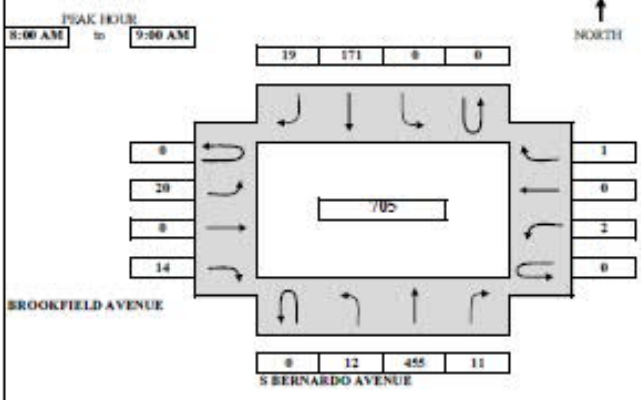


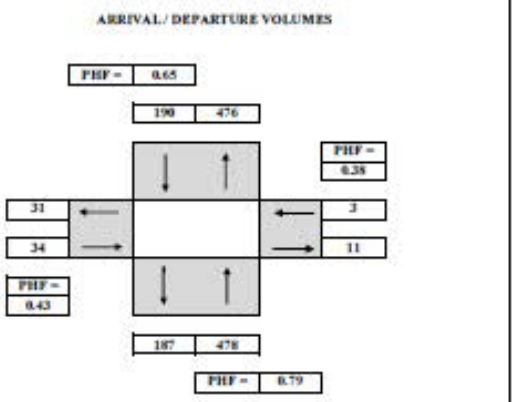
Attachment B: S Bernardo Avenue/Brookfield Avenue intersection: Corner sight distance WITHOUT parking

Attachment B: S Bernardo Avenue/Brookfield Avenue intersection: Corner sight distance WITH parking

Attachment C: S Bernardo Avenue/Brookfield Avenue intersection: AM Vehicle Counts

PROJECT:	TRAFFIC COUNTS IN SUNNYVALE	**SURVEY DATE:**	5/15/2018	**DAY:**	TUESDAY
N-S APPROACH:	S BERNARDO AVENUE	**SURVEY TIME:**	7:00 AM	**TO**	10:00 AM
E-W APPROACH:	BROOKFIELD AVENUE	**JURISDICTION:**	SUNNYVALE	**FILE:**	3805027-4AM





TIME PERIOD From	To	NORTHBOUND U-TURN	LEFT	THRU	RIGHT	SOUTHBOUND U-TURN	LEFT	THRU	RIGHT	EASTBOUND U-TURN	LEFT	THRU	RIGHT	WESTBOUND U-TURN	LEFT	THRU	RIGHT	TOTAL
SURVEY DATA																		
7:00 AM	7:15 AM		0	32	0	0	25	1		5	0	2		2	0	0		67
7:15 AM	7:30 AM		1	68	2	0	65	3		5	0	3		3	0	0		150
7:30 AM	7:45 AM		1	120	2	0	126	3		8	0	5		3	0	0		268
7:45 AM	8:00 AM		2	192	3	1	188	6		12	0	6		3	0	0		413
8:00 AM	8:15 AM		5	300	8	1	253	14		20	0	18		3	0	0		622
8:15 AM	8:30 AM		12	442	10	1	288	21		24	0	18		3	0	0		819
8:30 AM	8:45 AM		12	541	12	1	327	24		30	0	20		4	0	1		972
8:45 AM	9:00 AM		14	647	14	1	359	25		32	0	20		5	0	1		1118
9:00 AM	9:15 AM		15	763	15	1	398	31		39	0	23		5	0	1		1291
9:15 AM	9:30 AM		15	864	17	1	440	34		51	0	27		6	0	1		1456
9:30 AM	9:45 AM		15	953	19	1	476	37		59	0	27		7	1	1		1596
9:45 AM	10:00 AM		17	1028	20	1	510	40		69	0	33		7	1	1		1727
TOTAL BY PERIOD																		
7:00 AM	7:15 AM	0	0	32	0	0	0	25	1	0	5	0	2	0	2	0	0	67
7:15 AM	7:30 AM	0	1	36	2	0	0	40	2	0	0	0	1	0	1	0	0	83
7:30 AM	7:45 AM	0	0	52	0	0	0	61	0	0	3	0	2	0	0	0	0	118
7:45 AM	8:00 AM	0	1	72	1	0	1	62	3	0	4	0	1	0	0	0	0	145
8:00 AM	8:15 AM	0	3	108	5	0	0	65	8	0	8	0	12	0	0	0	0	209
8:15 AM	8:30 AM	0	7	142	2	0	0	35	7	0	4	0	0	0	0	0	0	197
8:30 AM	8:45 AM	0	0	99	2	0	0	39	3	0	6	0	2	0	1	0	1	153
8:45 AM	9:00 AM	0	2	106	2	0	0	32	1	0	2	0	0	0	1	0	0	146
9:00 AM	9:15 AM	0	1	116	1	0	0	39	6	0	7	0	3	0	0	0	0	173
9:15 AM	9:30 AM	0	0	101	2	0	0	42	3	0	12	0	4	0	1	0	0	165
9:30 AM	9:45 AM	0	0	89	2	0	0	36	3	0	8	0	0	0	1	1	0	140
9:45 AM	10:00 AM	0	2	75	1	0	0	34	3	0	10	0	6	0	0	0	0	131
HOURLY TOTALS																		
7:00 AM	8:00 AM	0	2	192	3	0	1	188	6	0	12	0	6	0	3	0	0	413
7:15 AM	8:15 AM	0	5	268	8	0	1	228	13	0	15	0	16	0	1	0	0	555
7:30 AM	8:30 AM	0	11	374	8	0	1	223	18	0	19	0	15	0	0	0	0	669
7:45 AM	8:45 AM	0	11	421	10	0	1	201	21	0	22	0	15	0	1	0	1	704
8:00 AM	9:00 AM	0	12	455	11	0	0	171	19	0	20	0	14	0	2	0	1	705
8:15 AM	9:15 AM	0	10	463	7	0	0	145	17	0	19	0	5	0	2	0	1	669
8:30 AM	9:30 AM	0	3	422	7	0	0	152	13	0	27	0	9	0	3	0	1	637
8:45 AM	9:45 AM	0	3	412	7	0	0	149	13	0	29	0	7	0	3	1	0	624
9:00 AM	10:00 AM	0	3	381	6	0	0	151	15	0	37	0	13	0	2	1	0	609

PEAK HOUR SUMMARY

8:00 AM to 9:00 AM	NORTHBOUND NBU	NBL	NBT	NBR	SOUTHBOUND SBU	SBL	SBT	SBR	EASTBOUND EBU	EBL	EBT	EBR	WESTBOUND WBU	WBL	WBT	WBR	TOTAL
VOLUME	0	12	455	11	0	0	171	19	0	20	0	14	0	2	0	1	705
PHF BY MOVEMENT	0.00	0.43	0.80	0.55	0.00	0.00	0.66	0.59	0.00	0.63	0.00	0.29	0.00	0.50	0.00	0.25	OVERALL
PHF BY APPROACH		0.79				0.65				0.43				0.38			0.84
BICYCLE		4				3				0				1			8
PEDESTRIAN		20				21				0				0			41
		N-LEG				S-LEG				E-LEG				W-LEG			
PEDESTRIAN BY LEG		0				0				0				41			41

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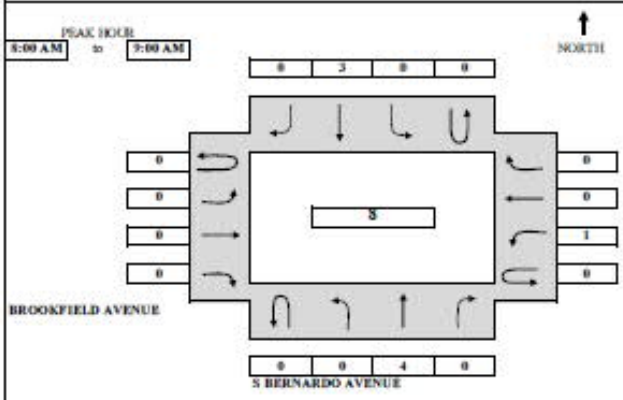
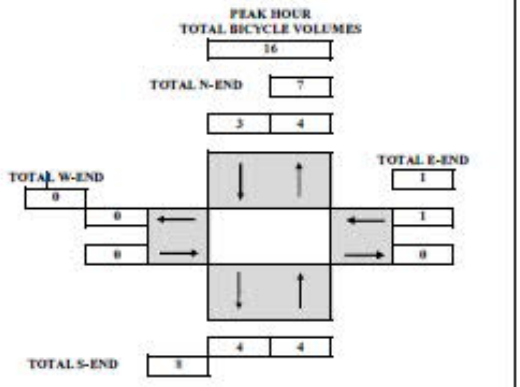
Attachment C: S Bernardo Avenue/Brookfield Avenue intersection: AM Bicycle Counts

PROJECT:	TRAFFIC COUNTS IN SUNNYVALE	**SURVEY DATE:**	5/15/2018	**DAY:**	TUESDAY
N-S APPROACH:	S BERNARDO AVENUE	**SURVEY TIME:**	7:00 AM	**TO**	10:00 AM
E-W APPROACH:	BROOKFIELD AVENUE	**JURISDICTION:**	SUNNYVALE	**FILE:**	3805027-4AM





TIME PERIOD			NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From		To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																			
7:00 AM	to	7:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	to	7:30 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
7:30 AM	to	7:45 AM	0	0	2	0	0	0	1	1	0	0	0	0	0	0	0	0	4
7:45 AM	to	8:00 AM	0	0	2	0	0	0	2	1	0	0	0	0	0	0	0	0	5
8:00 AM	to	8:15 AM	0	0	3	0	0	0	3	1	0	0	0	0	0	1	0	0	8
8:15 AM	to	8:30 AM	0	0	5	0	0	0	4	1	0	0	0	0	0	1	0	0	11
8:30 AM	to	8:45 AM	0	0	5	0	0	0	4	1	0	0	0	0	0	1	0	0	11
8:45 AM	to	9:00 AM	0	0	6	0	0	0	5	1	0	0	0	0	0	1	0	0	13
9:00 AM	to	9:15 AM	0	0	6	0	0	0	6	1	0	0	0	0	0	1	0	0	14
9:15 AM	to	9:30 AM	0	0	9	0	0	0	6	1	0	0	0	0	0	1	0	0	17
9:30 AM	to	9:45 AM	0	0	10	0	0	0	7	1	0	0	0	0	0	1	0	0	19
9:45 AM	to	10:00 AM	0	0	10	0	0	0	8	1	0	0	0	0	0	1	0	0	20
TOTAL BY PERIOD																			
7:00 AM	to	7:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	to	7:30 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
7:30 AM	to	7:45 AM	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2
7:45 AM	to	8:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
8:00 AM	to	8:15 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	3
8:15 AM	to	8:30 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3
8:30 AM	to	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	to	9:00 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
9:00 AM	to	9:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
9:15 AM	to	9:30 AM	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
9:30 AM	to	9:45 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
9:45 AM	to	10:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
HOURLY TOTALS																			
7:00 AM	to	8:00 AM	0	0	2	0	0	0	2	1	0	0	0	0	0	0	0	0	5
7:15 AM	to	8:15 AM	0	0	2	0	0	0	3	1	0	0	0	0	0	1	0	0	7
7:30 AM	to	8:30 AM	0	0	4	0	0	0	3	1	0	0	0	0	0	1	0	0	9
7:45 AM	to	8:45 AM	0	0	3	0	0	0	3	0	0	0	0	0	0	1	0	0	7
8:00 AM	to	9:00 AM	0	0	4	0	0	0	3	0	0	0	0	0	0	1	0	0	8
8:15 AM	to	9:15 AM	0	0	3	0	0	0	3	0	0	0	0	0	0	0	0	0	6
8:30 AM	to	9:30 AM	0	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0	6
8:45 AM	to	9:45 AM	0	0	5	0	0	0	3	0	0	0	0	0	0	0	0	0	8
9:00 AM	to	10:00 AM	0	0	4	0	0	0	3	0	0	0	0	0	0	0	0	0	7

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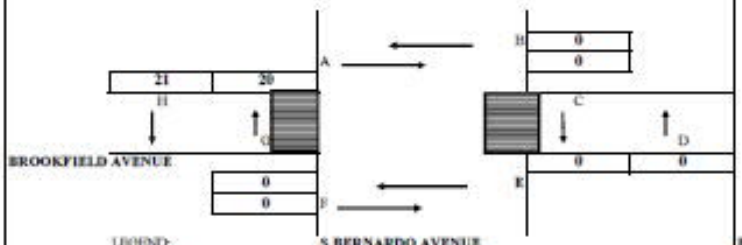
8:00 AM to 9:00 AM

APPROACH VOLUME	NB	SB	EB	WB	TOTAL
BICYCLE	4	3	0	1	8

Attachment C: S Bernardo Avenue/Brookfield Avenue intersection: AM Pedestrian Counts

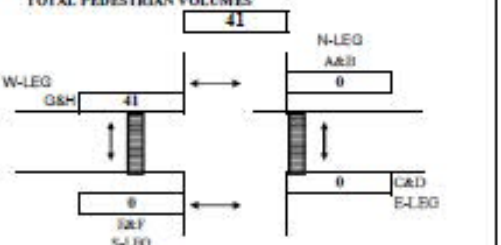
PROJECT:	**TRAFFIC COUNTS IN SUNNYVALE**	**SURVEY DATE:**	**5/15/2018**
N-S APPROACH:	**S BERNARDO AVENUE**	**DAY:**	**TUESDAY**
E-W APPROACH:	**BROOKFIELD AVENUE**	**JURISDICTION:**	**SUNNYVALE**
SURVEY PERIOD:	**7:00 AM TO 10:00 AM**	**FILE:**	**3805027-4AM**

PEAK HOUR
8:00 AM to 9:00 AM



LEGEND:
CROSSWALK
SIDEWALK
STOP CONTROL LINE
STOP

PEAK HOUR
TOTAL PEDESTRIAN VOLUMES



BY LEG:		BY DIRECTION:	
N-LEG	0	NB(D+G)	20
S-LEG	0	SB(C+H)	21
E-LEG	0	EB(A+F)	0
W-LEG	41	WB(B+E)	0

TIME PERIOD			NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From		To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA											
07:00 AM	---	07:15 AM	0	0	1	0	0	0	3	0	*4*
07:15 AM	---	07:30 AM	0	0	2	0	0	0	3	2	*7*
07:30 AM	---	07:45 AM	0	0	2	0	0	0	4	2	*8*
07:45 AM	---	08:00 AM	0	0	2	0	0	0	4	10	*16*
08:00 AM	---	08:15 AM	0	0	2	0	0	0	9	26	*37*
08:15 AM	---	08:30 AM	0	0	2	0	0	0	20	27	*49*
08:30 AM	---	08:45 AM	0	0	2	0	0	0	24	30	*56*
08:45 AM	---	09:00 AM	0	0	2	0	0	0	24	31	*57*
09:00 AM	---	09:15 AM	0	0	2	0	0	0	25	31	*58*
09:15 AM	---	09:30 AM	0	0	2	0	0	0	25	32	*59*
09:30 AM	---	09:45 AM	0	0	2	0	0	0	25	35	*62*
09:45 AM	---	10:00 AM	0	0	2	0	0	0	25	35	*62*
TOTAL BY PERIOD											
07:00 AM	---	07:15 AM	0	0	1	0	0	0	3	0	*4*
07:15 AM	---	07:30 AM	0	0	1	0	0	0	0	2	*3*
07:30 AM	---	07:45 AM	0	0	0	0	0	0	1	0	*1*
07:45 AM	---	08:00 AM	0	0	0	0	0	0	0	8	*8*
08:00 AM	---	08:15 AM	0	0	0	0	0	0	5	16	*21*
08:15 AM	---	08:30 AM	0	0	0	0	0	0	11	1	*12*
08:30 AM	---	08:45 AM	0	0	0	0	0	0	4	3	*7*
08:45 AM	---	09:00 AM	0	0	0	0	0	0	0	1	*1*
09:00 AM	---	09:15 AM	0	0	0	0	0	0	1	0	*1*
09:15 AM	---	09:30 AM	0	0	0	0	0	0	0	1	*1*
09:30 AM	---	09:45 AM	0	0	0	0	0	0	0	3	*3*
09:45 AM	---	10:00 AM	0	0	0	0	0	0	0	0	*0*
HOURLY TOTALS											
07:00 AM	---	08:00 AM	0	0	2	0	0	0	4	10	*16*
07:15 AM	---	08:15 AM	0	0	1	0	0	0	6	26	*33*
07:30 AM	---	08:30 AM	0	0	0	0	0	0	17	25	*42*
07:45 AM	---	08:45 AM	0	0	0	0	0	0	20	28	*48*
08:00 AM	---	09:00 AM	0	0	0	0	0	0	20	21	*41*
08:15 AM	---	09:15 AM	0	0	0	0	0	0	16	5	*21*
08:30 AM	---	09:30 AM	0	0	0	0	0	0	5	5	*10*
08:45 AM	---	09:45 AM	0	0	0	0	0	0	1	5	*6*
09:00 AM	---	10:00 AM	0	0	0	0	0	0	1	4	*5*

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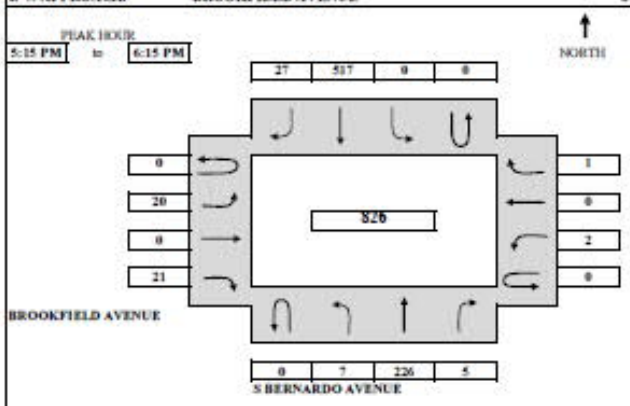
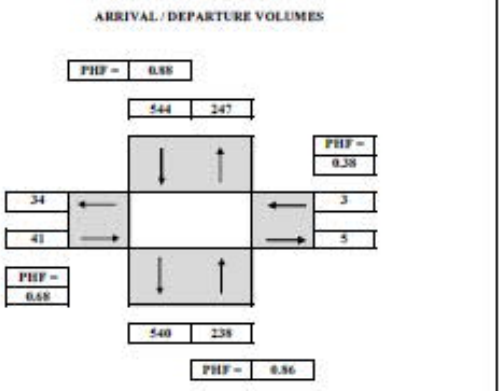
8:00 AM	to	9:00 AM				
VOLUME BY DIRECTION		NB	SB	EB	WB	TOTAL
PEDESTRIAN		20	21	0	0	41
VOLUME BY LEG		N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN		0	0	0	41	41

Attachment C: S Bernardo Avenue/Brookfield Avenue intersection: PM Vehicle Counts

PROJECT:	TRAFFIC COUNTS IN SUNNYVALE	**SURVEY DATE:**	5/15/2018	**DAY:**	TUESDAY
N-S APPROACH:	S BERNARDO AVENUE	**SURVEY TIME:**	4:00 PM	**TO**	7:00 PM
E-W APPROACH:	BROOKFIELD AVENUE	**JURISDICTION:**	SUNNYVALE	**FILE:**	3805027-2PM





TIME PERIOD			NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From		To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																			
4:00 PM	to	4:15 PM		0	49	0		0	64	8		10	0	6		1	0	0	138
4:15 PM	to	4:30 PM		3	96	2		0	143	13		17	0	12		3	0	0	289
4:30 PM	to	4:45 PM		4	137	4		0	232	17		20	0	15		5	0	1	435
4:45 PM	to	5:00 PM		4	180	5		0	332	25		24	0	21		6	0	1	598
5:00 PM	to	5:15 PM		4	223	7		0	451	32		25	0	24		6	0	3	775
5:15 PM	to	5:30 PM		4	278	10		0	570	36		31	0	29		8	0	3	969
5:30 PM	to	5:45 PM		5	327	10		0	719	41		35	0	34		8	0	3	1182
5:45 PM	to	6:00 PM		9	383	11		0	853	49		37	0	38		8	0	3	1391
6:00 PM	to	6:15 PM		11	449	12		0	968	59		45	0	45		8	0	4	1601
6:15 PM	to	6:30 PM		11	499	13		1	1082	64		49	0	48		11	0	4	1782
6:30 PM	to	6:45 PM		12	535	14		1	1191	72		53	0	58		11	0	4	1951
6:45 PM	to	7:00 PM		13	597	14		2	1272	77		59	0	60		12	0	4	2110
TOTAL BY PERIOD																			
4:00 PM	to	4:15 PM	0	0	49	0	0	0	64	8	0	10	0	6	0	1	0	0	138
4:15 PM	to	4:30 PM	0	3	47	2	0	0	79	5	0	7	0	6	0	2	0	0	151
4:30 PM	to	4:45 PM	0	1	41	2	0	0	89	4	0	3	0	3	0	2	0	1	146
4:45 PM	to	5:00 PM	0	0	43	1	0	0	100	8	0	4	0	6	0	1	0	0	163
5:00 PM	to	5:15 PM	0	0	43	2	0	0	119	7	0	1	0	3	0	0	0	2	177
5:15 PM	to	5:30 PM	0	0	55	3	0	0	119	4	0	6	0	5	0	2	0	0	194
5:30 PM	to	5:45 PM	0	1	49	0	0	0	149	5	0	4	0	5	0	0	0	0	213
5:45 PM	to	6:00 PM	0	4	56	1	0	0	134	8	0	2	0	4	0	0	0	0	209
6:00 PM	to	6:15 PM	0	2	66	1	0	0	115	10	0	8	0	7	0	0	0	1	210
6:15 PM	to	6:30 PM	0	0	50	1	0	1	114	5	0	4	0	3	0	3	0	0	181
6:30 PM	to	6:45 PM	0	1	36	1	0	0	109	8	0	4	0	10	0	0	0	0	169
6:45 PM	to	7:00 PM	0	1	62	0	0	1	81	5	0	6	0	2	0	1	0	0	159
HOURLY TOTALS																			
4:00 PM	to	5:00 PM	0	4	180	5	0	0	332	25	0	24	0	21	0	6	0	1	598
4:15 PM	to	5:15 PM	0	4	174	7	0	0	387	24	0	15	0	18	0	5	0	3	637
4:30 PM	to	5:30 PM	0	1	182	8	0	0	427	23	0	14	0	17	0	5	0	3	680
4:45 PM	to	5:45 PM	0	1	190	6	0	0	487	24	0	15	0	19	0	3	0	2	747
5:00 PM	to	6:00 PM	0	5	203	6	0	0	521	24	0	13	0	17	0	2	0	2	793
5:15 PM	to	6:15 PM	0	7	226	5	0	0	517	27	0	20	0	21	0	2	0	1	826
5:30 PM	to	6:30 PM	0	7	221	3	0	1	512	28	0	18	0	19	0	3	0	1	813
5:45 PM	to	6:45 PM	0	7	208	4	0	1	472	31	0	18	0	24	0	3	0	1	769
6:00 PM	to	7:00 PM	0	4	214	3	0	2	419	28	0	22	0	22	0	4	0	1	719

PEAK HOUR SUMMARY

5:15 PM to 6:15 PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	
VOLUME	0	7	226	5	0	0	517	27	0	20	0	21	0	2	0	1	826
PHF BY MOVEMENT	0.00	0.44	0.86	0.42	0.00	0.00	0.87	0.68	0.00	0.63	0.00	0.75	0.00	0.25	0.00	0.25	OVERALL
PHF BY APPROACH			0.86				0.88				0.68				0.38		0.97
BICYCLE			4				6				0				0		10
PEDESTRIAN			14				0				0				0		14
			N-LEG				S-LEG				E-LEG				W-LEG		
PEDESTRIAN BY LEG:			0				0				0				14		14

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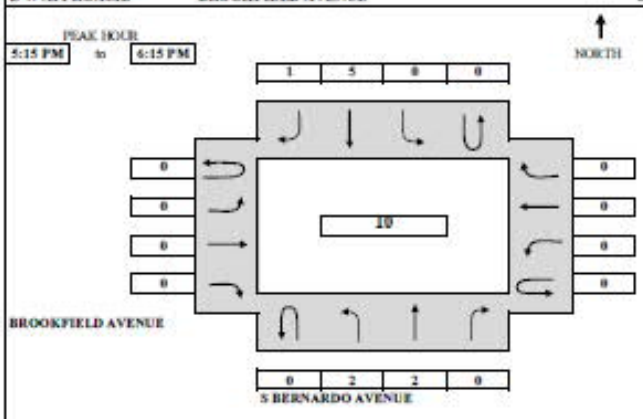
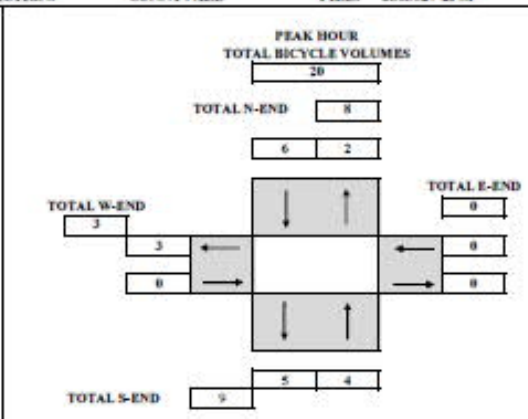
Attachment C: S Bernardo Avenue/Brookfield Avenue intersection: PM Bicycle Counts

PROJECT:	**TRAFFIC COUNTS IN SUNNYVALE**	**SURVEY DATE:**	**5/15/2018**	**DAY:**	**TUESDAY**
N-S APPROACH:	**S BERNARDO AVENUE**	**SURVEY TIME:**	**4:00 PM**	**TO**	**7:00 PM**
E-W APPROACH:	**BROOKFIELD AVENUE**	**JURISDICTION:**	**SUNNYVALE**	**FILE:**	**3805027-2PM**





TIME PERIOD			NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
From		To	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	U-TURN	LEFT	THRU	RIGHT	
SURVEY DATA																			
4:00 PM	to	4:15 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
4:15 PM	to	4:30 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
4:30 PM	to	4:45 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3
4:45 PM	to	5:00 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3
5:00 PM	to	5:15 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3
5:15 PM	to	5:30 PM	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0	6
5:30 PM	to	5:45 PM	0	1	3	0	0	0	5	0	0	0	0	0	0	0	0	0	9
5:45 PM	to	6:00 PM	0	1	3	0	0	0	6	0	0	0	0	0	0	0	0	0	10
6:00 PM	to	6:15 PM	0	2	4	0	0	0	6	1	0	0	0	0	0	0	0	0	13
6:15 PM	to	6:30 PM	0	2	4	0	0	0	6	1	0	0	0	0	0	0	0	0	13
6:30 PM	to	6:45 PM	0	2	4	0	0	0	6	1	0	0	0	0	0	0	0	0	13
6:45 PM	to	7:00 PM	0	2	4	0	0	0	7	1	0	1	0	0	0	0	0	0	15
TOTAL BY PERIOD																			
4:00 PM	to	4:15 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2
4:15 PM	to	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	to	4:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	to	5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	to	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	to	5:30 PM	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
5:30 PM	to	5:45 PM	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	3
5:45 PM	to	6:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
6:00 PM	to	6:15 PM	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	3
6:15 PM	to	6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	to	6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	to	7:00 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2
HOURLY TOTALS																			
4:00 PM	to	5:00 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	3
4:15 PM	to	5:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	to	5:30 PM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	4
4:45 PM	to	5:45 PM	0	1	1	0	0	0	4	0	0	0	0	0	0	0	0	0	6
5:00 PM	to	6:00 PM	0	1	1	0	0	0	5	0	0	0	0	0	0	0	0	0	7
5:15 PM	to	6:15 PM	0	2	2	0	0	0	5	1	0	0	0	0	0	0	0	0	10
5:30 PM	to	6:30 PM	0	2	2	0	0	0	2	1	0	0	0	0	0	0	0	0	7
5:45 PM	to	6:45 PM	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	4
6:00 PM	to	7:00 PM	0	1	1	0	0	0	1	1	0	1	0	0	0	0	0	0	5

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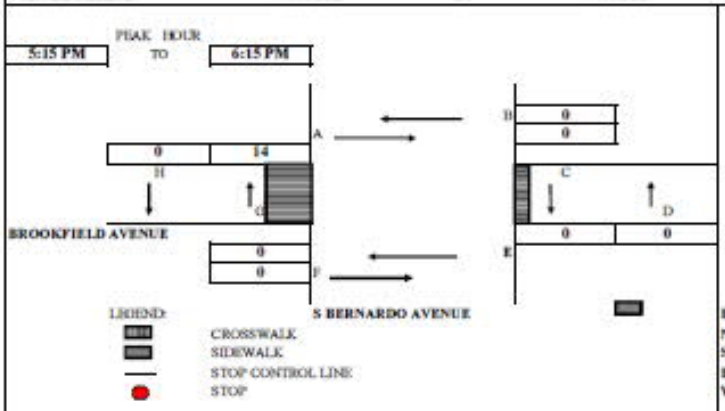
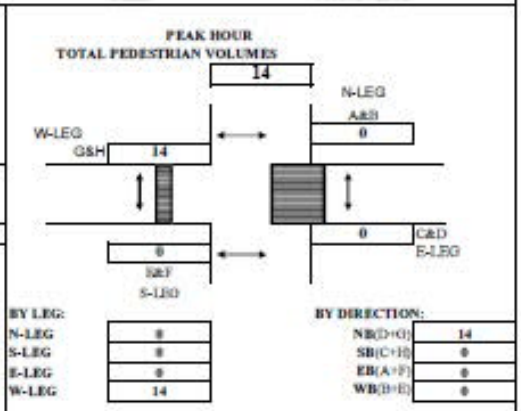
5:15 PM	to	6:15 PM					
APPROACH VOLUME:			NB	SB	EB	WB	TOTAL
BICYCLE			4	6	0	0	10

Attachment C: S Bernardo Avenue/Brookfield Avenue intersection: PM Pedestrian Counts

PROJECT:	**TRAFFIC COUNTS IN SUNNYVALE**	**SURVEY DATE:**	**5/15/2018**
N-S APPROACH:	**S BERNARDO AVENUE**	**DAY:**	**TUESDAY**
E-W APPROACH:	**BROOKFIELD AVENUE**	**JURISDICTION:**	**SUNNYVALE**
SURVEY PERIOD:	**4:00 PM TO 7:00 PM**	**FILE:**	**38050727-2PM**





TIME PERIOD			NORTH X-WALK		EAST X-WALK		SOUTH X-WALK		WEST X-WALK		
From		To	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*TOTAL*
SURVEY DATA											
04:00 PM	---	04:15 PM	0	0	0	0	0	0	3	3	*6*
04:15 PM	---	04:30 PM	0	0	1	0	0	0	6	4	*11*
04:30 PM	---	04:45 PM	0	0	1	0	0	0	6	4	*11*
04:45 PM	---	05:00 PM	0	0	1	0	0	0	6	6	*13*
05:00 PM	---	05:15 PM	0	0	1	1	0	0	8	7	*17*
05:15 PM	---	05:30 PM	0	0	1	1	0	0	10	7	*19*
05:30 PM	---	05:45 PM	0	0	1	1	0	0	12	7	*21*
05:45 PM	---	06:00 PM	0	0	1	1	0	0	19	7	*28*
06:00 PM	---	06:15 PM	0	0	1	1	0	0	22	7	*31*
06:15 PM	---	06:30 PM	0	0	1	1	0	0	22	8	*32*
06:30 PM	---	06:45 PM	0	0	1	1	0	0	24	9	*35*
06:45 PM	---	07:00 PM	0	0	3	1	0	0	24	9	*37*
TOTAL BY PERIOD											
04:00 PM	---	04:15 PM	0	0	0	0	0	0	3	3	*6*
04:15 PM	---	04:30 PM	0	0	1	0	0	0	3	1	*5*
04:30 PM	---	04:45 PM	0	0	0	0	0	0	0	0	*0*
04:45 PM	---	05:00 PM	0	0	0	0	0	0	0	2	*2*
05:00 PM	---	05:15 PM	0	0	0	1	0	0	2	1	*4*
05:15 PM	---	05:30 PM	0	0	0	0	0	0	2	0	*2*
05:30 PM	---	05:45 PM	0	0	0	0	0	0	2	0	*2*
05:45 PM	---	06:00 PM	0	0	0	0	0	0	7	0	*7*
06:00 PM	---	06:15 PM	0	0	0	0	0	0	3	0	*3*
06:15 PM	---	06:30 PM	0	0	0	0	0	0	0	1	*1*
06:30 PM	---	06:45 PM	0	0	0	0	0	0	2	1	*3*
06:45 PM	---	07:00 PM	0	0	2	0	0	0	0	0	*2*
HOURLY TOTALS											
04:00 PM	---	05:00 PM	0	0	1	0	0	0	6	6	*13*
04:15 PM	---	05:15 PM	0	0	1	1	0	0	5	4	*11*
04:30 PM	---	05:30 PM	0	0	0	1	0	0	4	3	*8*
04:45 PM	---	05:45 PM	0	0	0	1	0	0	6	3	*10*
05:00 PM	---	06:00 PM	0	0	0	1	0	0	13	1	*15*
05:15 PM	---	06:15 PM	0	0	0	0	0	0	14	0	*14*
05:30 PM	---	06:30 PM	0	0	0	0	0	0	12	1	*13*
05:45 PM	---	06:45 PM	0	0	0	0	0	0	12	2	*14*
06:00 PM	---	07:00 PM	0	0	2	0	0	0	5	2	*9*

Tel : (510) 232-1271 *Fax: (510) 232-1272*

5:15 PM	to	6:15 PM				
VOLUME BY DIRECTION		NB	SB	EB	WB	TOTAL
PEDESTRIAN		14	0	0	0	14
VOLUME BY LEG		N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN		0	0	0	14	14