

AGENDA

Meeting of the San Marcos Traffic Commission

Meeting Date: December 6, 2017 | **Meeting Time:** 6:00 PM

Location: City Council Chambers, 1 Civic Center Drive, San Marcos CA 92069

Americans with Disabilities Act: If you need special assistance to participate in this meeting, please contact the City Clerk Department at (760) 744-1050, ext. 3105. Notification 48 hours in advance will enable the City to make reasonable arrangements to ensure accessibility to this meeting. Assisted listening devices are available for the hearing impaired. Please see the City Clerk if you wish to use this device.

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1. CALL TO ORDER - 6:00 P.M.

2. PLEDGE OF ALLEGIANCE

3. ROLL CALL

Anyone wishing to speak to the Commission on any item must first complete a Request to Speak form and turn it in to the secretary

4. ORAL COMMUNICATIONS

Persons wishing to speak on a matter not on the agenda may be heard at this time; however, no action will be taken until placed on a future agenda.

5. APPROVAL OF MINUTES

October 4, 2017

6. OLD BUSINESS

a. None

7. NEW BUSINESS

- a. Borden Road and Fulton Road – Intersection Safety Improvements

8. REPORTS AND INFORMATION ITEMS

- a. Work Order Updates
- b. San Diego County Sheriff's Department Traffic Collision Summary And Accident Investigation Log
- c. Traffic Commission Commentary
- d. Staff Commentary

ADJOURNMENT

AFFIDAVIT OF POSTING

STATE OF CALIFORNIA)
COUNTY OF SAN DIEGO) ss.
CITY OF SAN MARCOS)

I, Denise Avila, Secretary, San Marcos Traffic Commission, hereby certify that I caused the posting on November 30, 2017 of this agenda in the glass display case at the north entrance of City Hall.

DATED: November 30, 2017



Denise Avila,
Traffic Commission Secretary

MINUTES

Meeting of the San Marcos Traffic Commission

WEDNESDAY, OCTOBER 4, 2017 | 6:00 PM

City Council Chambers, 1 Civic Center Drive, San Marcos, CA 92069

CALL TO ORDER: Chairman Hansen called the Traffic Commission Meeting to order at 6:01 p.m.

PLEDGE OF ALLEGIANCE: Led by Commissioner Buckley

ROLL CALL:

PRESENT: MASTERSON, NICKEL, MAKROGIANNIS, HANSEN, RICO, COLLINS, BUCKLEY

ABSENT: MOMCILO

ALSO PRESENT: Alternate Commissioner, Ed Musgrove; Senior Traffic Engineer, Mike Rafael; Principal Traffic Engineer, Nicholas Abboud; Sheriff Deputy, Mark Foster; and Traffic Commission Secretary, Denise Avila.

ORAL COMMUNICATIONS

Dr. Pierce Flynn resides at 3427 Arborview Drive, expressed concerns about the increasing high-speed commercial truck (5 tons+) traffic along W Linda Vista Drive at all hours of the day and into the night. He expressed safety concerns due to the amount of families that live in the Arbor Ranch community and the commercial truck noise. He expressed gratitude for the signage the City of San Marcos has posted in the area but the commercial truck drivers do not appear to be observing.

Engineering staff to report back to the Traffic Commission on findings and recommendations after completion of their investigation.

APPROVAL OF MINUTES – September 6, 2017

Commissioner Buckley makes a motion to accept the minutes as recorded. Commissioner Makrogiannis seconds the motion. Motion carries.

DRAFT

AYES: COMMISSIONERS: MASTERSON, NICKEL, MAKROGIANNIS, HANSEN, RICO, COLLINS, BUCKLEY

NOES: COMMISSIONERS:

ABSTAINS: COMMISSIONER:

6) OLD BUSINESS

- a. None

7) NEW BUSINESS

- a. Request for One-Way STOP Sign at Buckhorn Avenue and Iron Horse Drive

City staff received a request from a resident to re-evaluate the intersection of Buckhorn Avenue and Iron Horse Drive in the Discovery Hills community due to vehicular traffic increase, speeding, and limited sight distance at resident's driveway on 918 Iron Horse Drive.

Staff recommendations:

The installation of a One-way STOP sign on the northbound approach of Buckhorn Avenue at Iron Horse Drive, roadway striping improvements and STOP pavement legend and STOP bar along the northbound approach of Buckhorn Avenue.

Donna Renteria resides at 918 Iron Horse Drive, expressed concerns on items not on the Agenda. Commission recommended City staff to address this item on a future Agenda.

Commissioner Rico makes a motion to accept staff recommendations on the installation of a One-way STOP sign at Buckhorn Avenue and Iron Horse Drive. Commissioner Makrogiannis seconds the motion. Motion carries.

AYES: COMMISSIONERS: MASTERSON, NICKEL, MAKROGIANNIS, HANSEN, RICO, COLLINS, BUCKLEY

NOES: COMMISSIONERS:

ABSTAINS: COMMISSIONER:

DRAFT

8) REPORTS AND INFORMATION ITEMS

- a. Work Order Updates
- b. San Diego County Sheriff's Department Traffic Collision Summary And Accident Investigation Log
- c. Traffic Commission Commentary
- d. Staff Commentary

9) ADJOURNMENT: Chairman Hansen adjourned the meeting at 7:00 pm.

Michael Hansen, Chairman
Traffic Commission

ATTEST:

Denise Avila, Secretary
Traffic Commission

DRAFT

AGENDA REPORT

Meeting of the San Marcos Traffic Commission

MEETING DATE: December 6, 2017
AGENDA ITEM NO: 7A
SUBMITTED BY: Michael Rafael, P.E. – Senior Civil Engineer 
APPROVED BY: Nic Abboud, P.E. – Principal Civil Engineer 
SUBJECT: Borden Road and Fulton Road - Intersection Safety Improvements

BACKGROUND:

City staff received traffic safety concerns from residents in regards to the intersection of Borden Road and Fulton Road earlier this year. Residents reported having difficulty in exiting Fulton Road onto Borden Road during the morning peak period. Residents expressed their concerns of high speed vehicles and heavy traffic volumes on Borden Road. Some residents feel that this roadway section of Borden Road has turned into a high-speed drag strip and have repeatedly witnessed motorists dangerously passing other vehicles on the right side. Residents would like the City to consider installation of an ALL WAY STOP or new traffic signal. In addition, there were safety concerns of pedestrians crossing west of the intersection where two existing City trails meet due to the existing roadway curve.

DISCUSSION:

The study area is located at the intersection of Borden Road and Fulton Road (see attached Vicinity Map). Borden Road is classified as a four (4) lane major arterial roadway per the City's General Plan. Borden Road is generally one-lane in each direction from Woodland Parkway to Vineyard Road. Borden Road widens to two lanes from Vineyard Road to Las Posas. There is a short two-lane segment from the Rose Ranch/Borden Road traffic signal intersection to Fulton Road. Richland Elementary school is approximately 1200 feet east of the intersection. The speed limit is posted at 40 MPH on Borden Road between Woodland Parkway and Mulberry Drive. Since the inception of Borden Road bridge in June 2013, traffic volumes have significantly increased by at least 75 percent. Motorists have used Borden Road as an alternate route to Twin Oaks Valley Road and Palomar College due to the heavy congestion and delays on SR-78 in the AM and PM peaks. The intersection is currently uncontrolled on Borden Road with separate left turn lanes onto Fulton Road. There are two (2) lanes traveling westbound on Borden Road where the No. 2 through lane drops into a right turn lane onto northbound Fulton Road. There is only one (1) lane in the eastbound direction. The intersection is generally flat. The existing school zone starts at approximately 300 feet east of Fulton Road. There is an acceleration lane on westbound Borden Road for motorists turning right from Fulton Road. There are existing sidewalks and standard 5-foot bike lanes on both sides of Borden Road. Fulton Road is classified as a residential street north of Borden where it provides access to the Mesa Valle community of forty (40) single family homes. Fulton Road is also classified as a residential/collector street, south of Borden Road to Woodland Parkway, where it provides

access to single family residents in the area. Fulton Road also allows access to westbound Borden Road and provides an alternative route for commuters interested in bypassing the congested Woodland Parkway/El Norte Parkway/Borden Road intersection, especially during the peak hours.

Based on the residents' traffic concerns, City staff conducted an engineering study to investigate the feasibility of installing an ALL WAY STOP or new traffic signal. Installation of a new traffic signal or an ALL WAY STOP may be warranted based on the California Manual on Uniform Traffic Control Devices (CA MUTCD) guidelines. The CAMUTCD establishes specific minimum warrants that should be met before an intersection is considered for installation of a new traffic signal or an ALL WAY STOP to improve the overall safety and operation of the intersection. The warrants for installation of a new traffic signal include satisfying four or eight hour vehicular traffic volumes, peak hour volumes, pedestrian volumes, crash experience, and school crossing operations. At least one warrant needs to be met to justify the consideration of a new traffic signal.

Intersection turning count movements were collected for both AM and PM peak periods. The heaviest traffic volumes were recorded on Borden Road which amounted to 845 vehicles traveling westbound in the AM peak hour (7-8am) and 705 vehicles traveling eastbound in the PM peak hour (4:30-5:30pm). Northbound left turn movements on Fulton Road to westbound Borden was considerably high at 151 vehicles in the AM peak period. In addition, right turning vehicles on eastbound Borden Road to Fulton Road was also high at 216 vehicles in the AM peak and 140 vehicles in the PM peak. Left turning movements onto Borden Road from southbound Fulton Road were relatively low between 2-17 vehicles during the AM and PM peak hours. The average daily traffic (ADT) volumes on Borden Road between Rose Ranch Road and Woodland Parkway were also collected. Based on the data collected, there was an increase of approximately 4,518 vehicles per day from 2013 to 2017 in both directions which accounts for a 55 percent increase. The ADT volumes on Borden Road between Woodland Parkway and Rose Ranch Road had an increase of 6,092 vehicles per day in both directions which accounts for a 75 percent increase.

Intersection sight distances from Fulton Road were measured to determine if there were adequate based on the prevailing speeds, to provide sufficient time for a vehicle on Borden Road to stop. The intersection was evaluated and determined to have sufficient stopping sight distances for the 85th percentile speed of 40 MPH. The field measured sight distances are greater than the minimum required stopping sight distance of 300 feet (see Intersection Sight Distance Exhibit). Collision history at the intersection was also researched for the last five (5) years. One (1) broadside vehicle collision was reported in 2016 at the intersection where the northbound driver on Fulton Road did not yield to traffic on Borden Road.

A gap study was conducted at the intersection during the AM peak period (7-9am) to determine if vehicles on Fulton Road had sufficient gaps in the traffic stream on Borden Road to turn onto the major roadway. Per AASHTO guidelines, typical time gaps recommended for passenger cars, single-unit trucks and combination trucks are 7.5 sec, 9.5 sec, and 11.5 sec, respectively. Data was collected for gaps on Borden Road of greater than or equal to 5 seconds for each minute of the two (2)-hour AM peak period.

Based on the data collected, there was at least one acceptable gap (7.5 sec or more) per minute. The size of the gaps were generally smaller in the AM peak hour (7-8am) for motorists turning left or right onto Borden Road. Larger gaps up to 20 seconds or more were recorded after the AM peak hour.

Based on the findings of this study, the subject intersection meets the requirements for a new traffic signal based on Section 4C.04 of the CAMUTCD, the peak hour warrant (Warrant 3). This warrant demonstrates the level of difficulty that the minor-street experiences when entering or crossing the major street. The heavy left turn traffic observed on northbound Fulton Road during the AM peak period (approximately 151 vehicles recorded) triggered this warrant. Borden Road also experienced significantly high traffic volumes of approximately 974 vehicles westbound and 408 vehicles eastbound during the AM peak.

An ALL WAY STOP control was also considered since it could be an alternative option in the interim until new traffic signals are constructed. However, it was not recommended for it would seriously disrupt progression of traffic flow on Borden Road and cause excessive traffic queues on westbound and eastbound Borden Road during the AM and PM peak periods. Based on our model simulation, the westbound traffic queue length during the AM peak period would be approximately 691 feet long with the installation of an ALL WAY STOP control, reaching the intersection of Red Hill Lane and Borden Road. The eastbound traffic would also queue up to 327 feet long during the PM peak period. A recommendation to install a traffic signal at the intersection will be submitted to the City's Capital Improvement Program (CIP) section for further evaluation and prioritization. The recommended signalization project will need to compete with other capital infrastructure projects for future implementation and budgeting in the CIP program.

In the interim, City staff proposes roadway signing and striping improvements on Borden Road to improve traffic operations at the intersection. City staff observed motorists dangerously passing other vehicles in the westbound Borden Road direction, illegally using the existing right turn lane to Fulton Road to go straight. Staff recommends installation of lane reduction markings and gore areas/buffered bike lanes in advance of Fulton Road in the westbound direction to channelize traffic into the one through lane and prevent this unsafe passing maneuver. This new striping improvement will help guide vehicular traffic through the transition area where the lanes will be reduced (see Proposed Roadway Striping Exhibit).

Similarly, staff recommends installation of a new center left turn lane to enhance vehicular operations at the intersection. The center left turn lane can be used as a halfway stop (refuge) for vehicles turning left from Fulton Road when a gap in the eastbound Borden traffic presents itself, then wait for a gap in the westbound Borden traffic or drive inside the lane (no more than 200 feet) to merge easily into adjacent flowing traffic on Borden Road. The current separated left turn lanes into Fulton Road are not recommended based on the existing low traffic turning volumes (varies from 2-17 vehicles per hour; see Proposed Roadway Striping Exhibit).

Pedestrian counts were also collected and reviewed at the trail crossing west of the intersection. Collected data indicated low values during the AM and PM peak periods. The existing trail crossing was evaluated and determined to have sufficient sight distance for crossing one travel lane in each direction

and a center turn lane on Borden Road (See Pedestrian Sight Distance Exhibit). In addition, there have been no reported pedestrian and vehicle type collisions at the trail crossing. The City's Trail Master Plan (currently in draft form) recommends installation of a new signalized mid-block pedestrian crossing at this location. This capital improvement would need to be submitted to the City's CIP program for future budgeting and prioritization.

CONCLUSION AND RECOMMENDATIONS:

Engineering staff recommends installation of a new traffic signal at the intersection of Borden Road and Fulton Road based on satisfying the peak hour warrant per the CA MUTCD standard criteria. The proposed traffic signal will be submitted to the City's CIP section for further evaluation, prioritization, budgeting and implementation in the CIP program. In the interim, City staff recommends roadway signing and striping improvements on Borden Road and at the intersection of Borden Road and Fulton Road to improve vehicular traffic operations overall safety for all roadway users. The proposed improvements include installation of new center left turn lanes, buffered bike lane, lane reduction markings, and regulatory/warning signage. Staff also recommends periodic speed enforcement by the Sheriff's Department at the intersection of Borden Road and Fulton Road during the AM and PM peak periods.

Traffic Data/Roadway Information:

Traffic Volumes:

Borden Road (Woodland Parkway to Rose Ranch Road) – 8,168 VPD (vehicles per day, 2013).

Borden Road (Woodland Parkway to Rose Ranch Road) – 14,260 VPD (vehicles per day, 2017).

Borden Road (Rose Ranch Road to Mulberry Drive) – 8,172 VPD (vehicles per day, 2013).

Borden Road (Rose Ranch Road to Mulberry Drive) – 12,690 VPD (vehicles per day, 2017).

Speed Limit:

Borden Road (Woodland Parkway to Mulberry Drive), 40 MPH, posted.

Borden Road (Mulberry Drive to Twin Oaks Valley Road), 35 MPH, posted.

Borden Road (Twin Oaks Valley Road to Las Posas Road), 40 MPH, posted.

Accident History (last 3 years): 1 (broadside) in September 2016

Unusual Conditions: None

Attachment(s)

Vicinity Map

Proposed Roadway Striping Exhibit

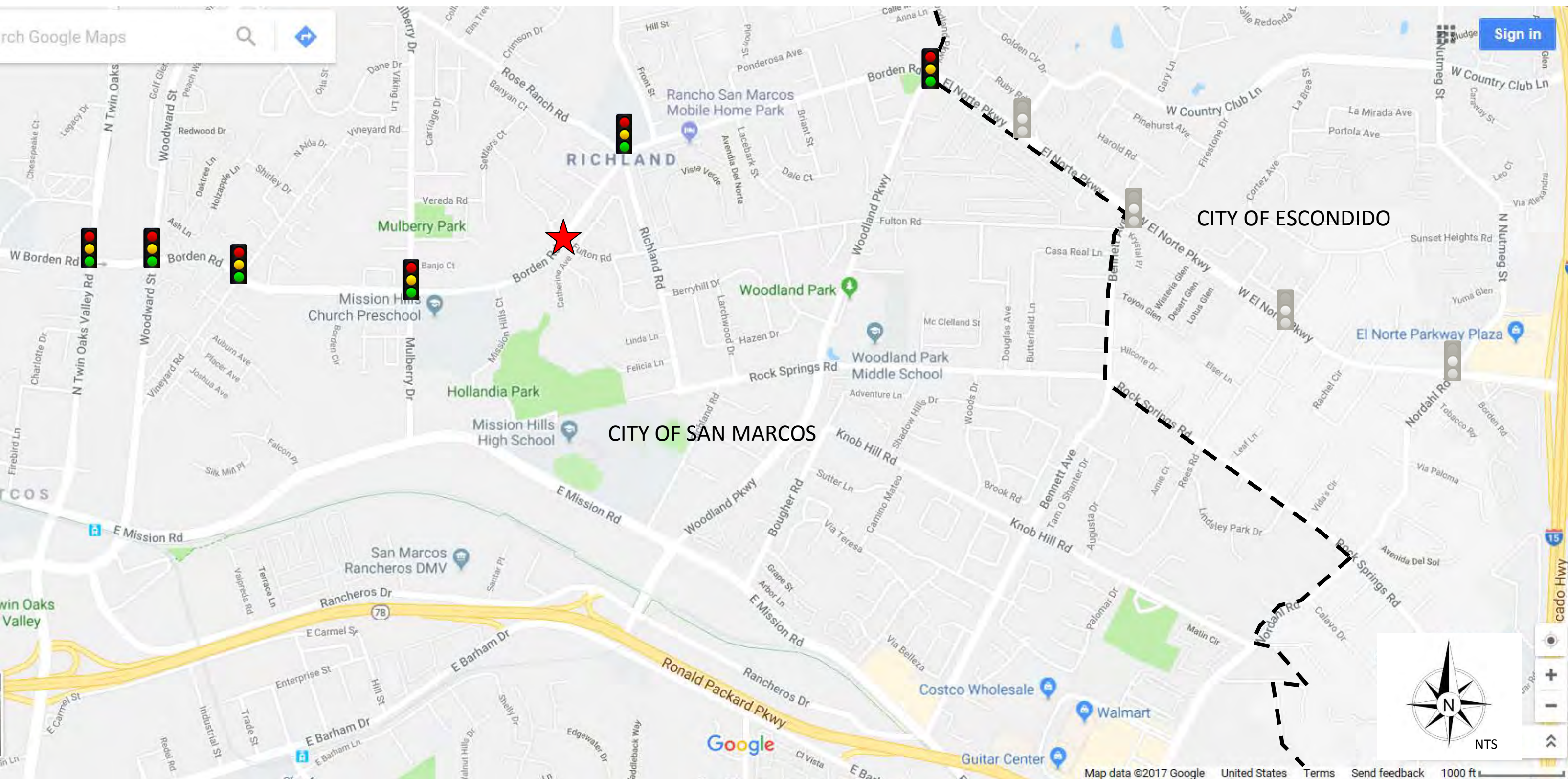
Borden Road Crosswalk Exhibit per the City's Trail Master Plan (Draft)

Intersection/Pedestrian Sight Distance Exhibits

Traffic Volume/Gap Study Data

Engineering and Traffic Speed Survey/ Photos

VICINITY MAP



EXISTING TRAFFIC SIGNALS ON
BORDEN ROAD



SUBJECT INTERSECTION
BORDEN ROAD @ FULTON ROAD

CITY OF SAN MARCOS
AGENDA #7A – TRAFFIC COMMISSION
DECEMBER 6, 2017



AGENDA #7A
TRAFFIC COMMISSION MEETING
DECEMBER 6, 2017

Borden Road and Fulton Road – Intersection Safety Improvements Proposed Roadway Striping Improvements



City of San Marcos Trails Master Plan

Proposed Trails

Borden Road Crosswalk for existing multi-use trail

LEGEND

Existing Trail Types

- Multi-Use
- Soft Surface
- Urban
- — — San Diego County Trails
- — — Carlsbad Trails

Proposed Trails: Impact / Effort Rating

- ① Highest Priority
- 2
- 3
- 4
- 5
- 6 Lowest Priority

DRAFT

RA 6800 INDIANA AVENUE, SUITE 245
RIVERSIDE, CALIFORNIA 92506
LIC. #1512
PH. (951) 781-1930 FAX (951) 686-8091

Pg. No. 16123

SEPT. 2017

EXHIBIT #

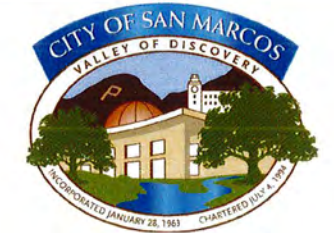
M1



- 1 Borden Road view 1
- Existing multi-use trail
 - Proposed safe crosswalk
 - Existing multi-use trail



- 2 Borden Road view 1
- Existing multi-use trail
 - Proposed safe crosswalk
 - Existing multi-use trail



City of San Marcos Trails
Master Plan
Proposed Trails

*Borden Road Crosswalk for
existing multi-use trail*

DRAFT

RA 6800 INDIANA AVENUE, SUITE 245
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Proj No. 16123

SEPT. 2017

EXHIBIT #

M2

- **Trail Purpose:** To provide a safe crossing at Borden Road along trail #32.
- **Rating:** This crossing will require low effort to create and will provide a high level of improved safety and connectivity.
- **Length:** 62 ft. of trail
- **Recommendations:** Recommend constructing painted crosswalk striping, pedestrian controlled stoplight with street flashing strips, and road signs indicating pedestrian crossing. Install "SIGNAL AHEAD" flashing sign east of trail crossing.
- **Issues:** Traffic moving west on Borden Road may find it hard to see the cross walk around the curve.



City of San Marcos Trails
Master Plan
Proposed Trails

*Borden Road Crosswalk for
existing multi-use trail*

DRAFT



6800 INDIANA AVENUE, SUITE 245
RIVERSIDE, CALIFORNIA 92506
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Pg. No. 16123

SEPT. 2017

EXHIBIT #

M3



AGENDA #7A
TRAFFIC COMMISSION MEETING
DECEMBER 6, 2017

INTERSECTION SIGHT DISTANCE EXHIBIT BORDEN ROAD AND FULTON ROAD



AGENDA #7A
TRAFFIC COMMISSION MEETING
DECEMBER 6, 2017

**PEDESTRIAN SIGHT DISTANCE EXHIBIT
AT BORDEN ROAD TRAIL CROSSING**

National Data & Surveying Services

Intersection Turning Movement Count

Location: Borden Rd & Fulton Rd
City: San Marcos
Control: 2-Way Stop(NB/SB)

Project ID: 17-04341-001
Date: 11/8/2017

Total

NS/EW Streets:	Fulton Rd				Fulton Rd				Borden Rd				Borden Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	1	0	0	0	1	0	0	1	1	0	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
7:00 AM	4	0	6	0	32	0	0	0	0	44	33	1	0	203	0	0	323
7:15 AM	2	0	0	0	42	0	1	0	0	51	99	0	4	251	1	0	451
7:30 AM	2	2	4	0	38	1	1	0	1	53	78	0	2	203	1	0	386
7:45 AM	2	3	1	0	39	0	1	0	1	70	6	0	1	188	0	0	312
8:00 AM	3	0	3	0	27	0	5	0	0	68	14	0	8	165	2	0	295
8:15 AM	1	0	1	0	24	0	2	0	2	46	21	0	20	162	2	0	281
8:30 AM	1	0	3	0	12	0	0	0	1	57	5	0	8	134	0	0	221
8:45 AM	0	0	0	0	19	0	0	0	0	38	17	0	1	192	0	0	267
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	15	5	18	0	233	1	10	0	5	427	273	1	44	1498	6	0	2536
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	10	5	11	0	151	1	3	0	2	218	216	1	7	845	2	0	1472
PEAK HR FACTOR :	0.625	0.417	0.458	0.000	0.899	0.250	0.750	0.000	0.500	0.779	0.545	0.250	0.438	0.842	0.500	0.000	0.816
	0.650				0.901				0.728				0.834				

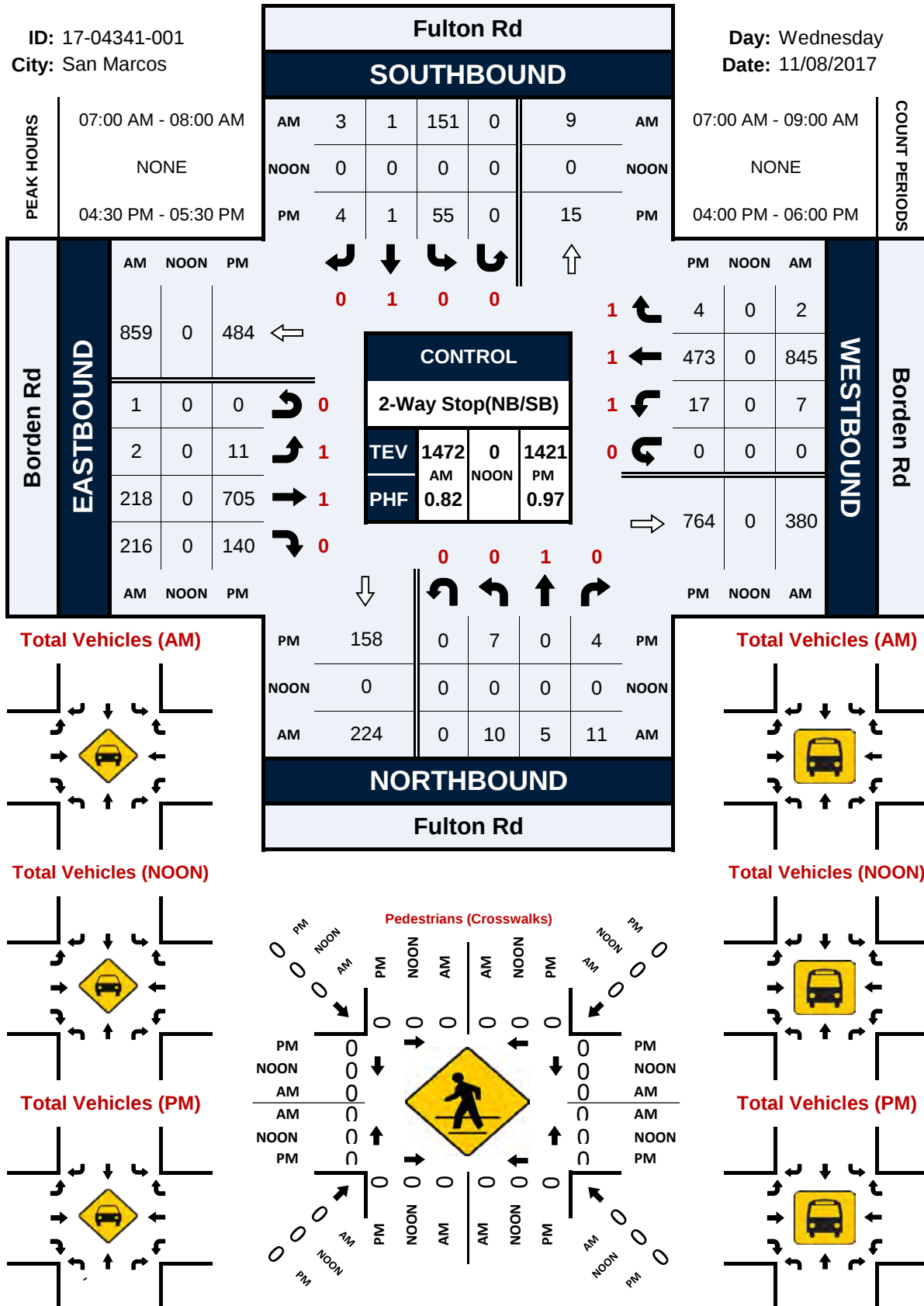
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	1	0	0	0	1	0	0	1	1	0	0	1	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
4:00 PM	0	0	1	0	11	0	0	0	3	170	27	0	5	90	2	0	309
4:15 PM	1	0	2	0	12	0	0	0	1	160	35	0	3	130	3	0	347
4:30 PM	4	0	2	0	18	0	4	0	4	177	34	0	6	118	1	0	368
4:45 PM	0	0	0	0	10	1	0	0	4	171	39	0	2	115	1	0	343
5:00 PM	2	0	1	0	20	0	0	0	0	183	33	0	3	116	2	0	360
5:15 PM	1	0	1	0	7	0	0	0	3	174	34	0	6	124	0	0	350
5:30 PM	1	0	3	0	17	0	1	0	3	137	22	0	2	127	5	0	318
5:45 PM	0	1	0	0	14	1	1	0	0	118	29	0	3	100	3	0	270
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	9	1	10	0	109	2	6	0	18	1290	253	0	30	920	17	0	2665
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	7	0	4	0	55	1	4	0	11	705	140	0	17	473	4	0	1421
PEAK HR FACTOR :	0.438	0.000	0.500	0.000	0.688	0.250	0.250	0.000	0.688	0.963	0.897	0.000	0.708	0.954	0.500	0.000	0.965
	0.458				0.682				0.991				0.950				

Borden Rd & Fulton Rd

Peak Hour Turning Movement Count

ID: 17-04341-001
City: San Marcos

Day: Wednesday
Date: 11/08/2017



Pedestrian Study

Location: Borden Rd
City: San Marcos

Date: 11/8/2017
Day: Wednesday

TIME	Pedestrians		
	SB	NB	TOTAL
7:00 AM	0	0	0
7:15 AM	0	0	0
7:30 AM	0	0	0
7:45 AM	1	4	5
8:00 AM	0	0	0
8:15 AM	0	0	0
8:30 AM	0	0	0
8:45 AM	1	0	1
Totals	2	4	6
4:00 PM	0	0	0
4:15 PM	0	1	1
4:30 PM	0	0	0
4:45 PM	0	0	0
5:00 PM	0	0	0
5:15 PM	0	0	0
5:30 PM	0	2	2
5:45 PM	0	0	0
Totals	0	3	3

VOLUME

Borden Rd Bet. Rose Ranch Rd/Richland Rd & Woodland Pkwy

Day: Thursday
Date: 9/21/2017City: San Marcos
Project #: CA17_4291_019

DAILY TOTALS					NB	SB						EB	WB	Total
					0	0						6,777	7,483	14,260
AM Period	NB	SB	EB	WB	TOTAL		PM Period	NB	SB	EB	WB	TOTAL		
00:00			4	9	13		12:00			76	66	142		
00:15			4	4	8		12:15			94	57	151		
00:30			5	7	12		12:30			75	66	141		
00:45			4	17	2	22	12:45			97	342	59	248	590
01:00			3	3	6		13:00			90	78	168		
01:15			3	2	5		13:15			79	80	159		
01:30			0	2	2		13:30			68	83	151		
01:45			1	7	3	10	13:45			71	308	116	357	665
02:00			4	2	6		14:00			93	91	184		
02:15			0	0	0		14:15			116	109	225		
02:30			1	0	1		14:30			140	122	262		
02:45			2	7	2	4	14:45			127	476	131	453	929
03:00			2	2	4		15:00			106	149	255		
03:15			1	0	1		15:15			173	158	331		
03:30			0	2	2		15:30			200	152	352		
03:45			6	9	2	6	15:45			194	673	159	618	1291
04:00			8	5	13		16:00			201	143	344		
04:15			7	5	12		16:15			259	154	413		
04:30			9	4	13		16:30			242	182	424		
04:45			8	32	7	21	16:45			251	953	180	659	1612
05:00			18	10	28		17:00			237	181	418		
05:15			31	22	53		17:15			222	209	431		
05:30			24	26	50		17:30			218	198	416		
05:45			43	116	26	84	17:45			155	832	169	757	1589
06:00			54	34	88		18:00			162	183	345		
06:15			80	79	159		18:15			107	152	259		
06:30			77	113	190		18:30			100	134	234		
06:45			91	302	177	403	18:45			97	466	132	601	1067
07:00			91	199	290		19:00			83	92	175		
07:15			116	279	395		19:15			61	78	139		
07:30			111	265	376		19:30			62	46	108		
07:45			90	408	231	974	19:45			64	270	52	268	538
08:00			89	184	273		20:00			35	46	81		
08:15			99	209	308		20:15			43	36	79		
08:30			89	229	318		20:30			34	32	66		
08:45			82	359	142	764	20:45			54	166	39	153	319
09:00			61	140	201		21:00			29	36	65		
09:15			56	95	151		21:15			52	31	83		
09:30			85	70	155		21:30			41	27	68		
09:45			66	268	68	373	21:45			29	151	19	113	264
10:00			48	75	123		22:00			27	21	48		
10:15			65	67	132		22:15			18	15	33		
10:30			71	47	118		22:30			12	17	29		
10:45			57	241	60	249	22:45			9	66	11	64	130
11:00			70	50	120		23:00			15	8	23		
11:15			69	65	134		23:15			9	16	25		
11:30			65	66	131		23:30			8	9	17		
11:45			63	267	60	241	23:45			9	41	8	41	82
TOTALS			2033	3151	5184		TOTALS			4744	4332	9076		
SPLIT %			39.2%	60.8%	36.4%		SPLIT %			52.3%	47.7%	63.6%		

DAILY TOTALS					NB	SB						EB	WB	Total
					0	0						6,777	7,483	14,260
AM Peak Hour			06:45	07:00	07:00		PM Peak Hour			16:15	16:45	16:30		
AM Pk Volume			409	974	1382		PM Pk Volume			989	768	1704		
Pk Hr Factor			0.881	0.873	0.875		Pk Hr Factor			0.955	0.919	0.988		
7 - 9 Volume	0	0	767	1738	2505		4 - 6 Volume	0	0	1785	1416	3201		
7 - 9 Peak Hour			07:00	07:00	07:00		4 - 6 Peak Hour			16:15	16:45	16:30		
7 - 9 Pk Volume	0	0	408	974	1382		4 - 6 Pk Volume	0	0	989	768	1704		
Pk Hr Factor	0.000	0.000	0.879	0.873	0.875		Pk Hr Factor	0.000	0.000	0.955	0.919	0.988		

VOLUME

Borden Rd Bet. Mulberry Dr & Rose Ranch Rd/Richland Rd

Day: Thursday
Date: 9/21/2017City: San Marcos
Project #: CA17_4291_018

DAILY TOTALS					NB	SB	EB					WB	Total
					0	0	6,221					6,469	12,690
AM Period	NB	SB	EB	WB	TOTAL		PM Period	NB	SB	EB	WB	TOTAL	
00:00			6	5	11		12:00			63	59	122	
00:15			5	3	8		12:15			73	59	132	
00:30			5	3	8		12:30			68	60	128	
00:45			1	17	1	12	12:45			101	305	50	228
					2	29						151	533
01:00			6	2	8		13:00			95	58	153	
01:15			4	1	5		13:15			68	56	124	
01:30			1	0	1		13:30			79	67	146	
01:45			3	14	3	6	13:45			69	311	84	265
					6	20						153	576
02:00			2	1	3		14:00			98	72	170	
02:15			0	2	2		14:15			150	85	235	
02:30			1	0	1		14:30			172	120	292	
02:45			0	3	1	4	14:45			129	549	84	361
					1	7						213	910
03:00			2	3	5		15:00			137	97	234	
03:15			1	0	1		15:15			164	158	322	
03:30			1	2	3		15:30			157	154	311	
03:45			4	8	6	11	15:45			177	635	125	534
					10	19						302	1169
04:00			2	4	6		16:00			194	112	306	
04:15			2	4	6		16:15			238	118	356	
04:30			6	3	9		16:30			194	134	328	
04:45			2	12	14	35	16:45			195	821	131	495
					14	35						326	1316
05:00			9	11	20		17:00			240	149	389	
05:15			12	18	30		17:15			202	152	354	
05:30			11	39	50		17:30			189	163	352	
05:45			11	43	40	140	17:45			156	787	154	618
					40	140						310	1405
06:00			25	27	52		18:00			135	132	267	
06:15			35	65	100		18:15			119	119	238	
06:30			30	95	125		18:30			94	88	182	
06:45			44	134	209	486	18:45			85	433	104	443
					209	486						189	876
07:00			68	218	286		19:00			79	68	147	
07:15			136	272	408		19:15			66	47	113	
07:30			167	288	455		19:30			62	35	97	
07:45			87	458	369	1518	19:45			59	266	29	179
					369	1518						88	445
08:00			71	169	240		20:00			48	27	75	
08:15			74	204	278		20:15			53	28	81	
08:30			86	183	269		20:30			52	22	74	
08:45			40	271	222	1009	20:45			55	208	28	105
					222	1009						83	313
09:00			45	133	178		21:00			50	29	79	
09:15			44	89	133		21:15			55	23	78	
09:30			65	65	130		21:30			48	17	65	
09:45			45	199	96	537	21:45			35	188	14	83
					96	537						49	271
10:00			32	68	100		22:00			27	15	42	
10:15			54	78	132		22:15			18	8	26	
10:30			46	46	92		22:30			19	12	31	
10:45			52	184	106	430	22:45			13	77	6	41
					106	430						19	118
11:00			53	51	104		23:00			16	2	18	
11:15			72	47	119		23:15			12	9	21	
11:30			63	55	118		23:30			12	4	16	
11:45			60	248	117	458	23:45			10	50	5	20
					117	458						15	70
TOTALS			1591	3097	4688		TOTALS			4630	3372	8002	
SPLIT %			33.9%	66.1%	36.9%		SPLIT %			57.9%	42.1%	63.1%	

DAILY TOTALS					NB	SB						EB	WB						Total
					0	0						6,221	6,469						12,690
AM Peak Hour			07:15	07:00	07:00		PM Peak Hour			16:15	17:00	16:45							
AM Pk Volume			461	1060	1518		PM Pk Volume			867	618	1421							
Pk Hr Factor			0.690	0.920	0.834		Pk Hr Factor			0.903	0.948	0.913							
7 - 9 Volume	0	0	729	1798	2527		4 - 6 Volume	0	0	1608	1113	2721							
7 - 9 Peak Hour			07:15	07:00	07:00		4 - 6 Peak Hour			16:15	17:00	16:45							
7 - 9 Pk Volume	0	0	461	1060	1518		4 - 6 Pk Volume	0	0	867	618	1421							
Pk Hr Factor	0.000	0.000	0.690	0.920	0.834		Pk Hr Factor	0.000	0.000	0.903	0.948	0.913							

VOLUME

Fulton Rd E/O Catherine Ave

Day: Tuesday
Date: 11/14/2017City: San Marcos
Project #: CA17_4344_001

DAILY TOTALS					NB	SB						EB	WB						Total
					0	0						1,292	439						1,731
AM Period	NB	SB	EB	WB	TOTAL		PM Period	NB	SB	EB	WB	TOTAL							TOTAL
0:00			0	2	2		12:00			5	1	6							6
0:15			0	1	1		12:15			14	4	18							18
0:30			0	1	1		12:30			8	6	14							14
0:45			0	1	1	5	12:45			5	32	2	13	7	45				
1:00			1	1	2		13:00			6	6	12							12
1:15			0	0	0		13:15			10	1	11							11
1:30			0	1	1		13:30			18	1	19							19
1:45			0	1	0	2	13:45			19	53	3	11	22	64				
2:00			0	0	0		14:00			38	6	44							44
2:15			0	1	1		14:15			32	8	40							40
2:30			0	0	0		14:30			35	11	46							46
2:45			0	0	0	1	14:45			31	136	3	28	34	164				
3:00			0	0	0		15:00			31	6	37							37
3:15			0	0	0		15:15			48	8	56							56
3:30			0	1	1		15:30			34	7	41							41
3:45			0	0	0	1	15:45			26	139	8	29	34	168				
4:00			0	0	0		16:00			39	2	41							41
4:15			3	1	4		16:15			37	8	45							45
4:30			0	0	0		16:30			25	9	34							34
4:45			0	3	2	3	16:45			32	133	15	34	47	167				
5:00			0	1	1		17:00			39	21	60							60
5:15			1	3	4		17:15			37	10	47							47
5:30			0	1	1		17:30			26	6	32							32
5:45			4	5	1	6	17:45			24	126	14	51	38	177				
6:00			6	6	12		18:00			25	9	34							34
6:15			2	5	7		18:15			12	11	23							23
6:30			10	9	19		18:30			20	9	29							29
6:45			16	34	9	29	18:45			9	66	7	36	16	102				
7:00			27	15	42		19:00			14	12	26							26
7:15			68	10	78		19:15			9	8	17							17
7:30			95	14	109		19:30			8	6	14							14
7:45			28	218	10	49	19:45			7	38	3	29	10	67				
8:00			26	6	32		20:00			3	9	12							12
8:15			45	12	57		20:15			9	5	14							14
8:30			54	12	66		20:30			7	4	11							11
8:45			20	145	6	36	20:45			10	29	2	20	12	49				
9:00			5	2	7		21:00			6	3	9							9
9:15			5	3	8		21:15			5	3	8							8
9:30			8	3	11		21:30			8	2	10							10
9:45			7	25	4	12	21:45			4	23	6	14	10	37				
10:00			10	2	12		22:00			1	4	5							5
10:15			7	1	8		22:15			1	1	2							2
10:30			9	3	12		22:30			0	0	0							0
10:45			12	38	2	8	22:45			1	3	1	6	2	9				
11:00			10	4	14		23:00			1	0	1							1
11:15			11	4	15		23:15			1	1	2							2
11:30			7	4	11		23:30			0	1	1							1
11:45			14	42	1	13	23:45			1	3	1	3	2	6				
TOTALS					511	165	676	TOTALS					781	274	1055				
SPLIT %					75.6%	24.4%	39.1%	SPLIT %					74.0%	26.0%	60.9%				

DAILY TOTALS					NB	SB						EB	WB						Total
					0	0						1,292	439						1,731
AM Peak Hour			7:00	7:00	7:00		PM Peak Hour			15:15	16:30	16:30							
AM Pk Volume			218	49	267		PM Pk Volume			147	55	188							
Pk Hr Factor			0.574	0.817	0.612		Pk Hr Factor			0.766	0.655	0.783							
7 - 9 Volume	0	0	363	85	448		4 - 6 Volume	0	0	259	85	344							
7 - 9 Peak Hour			7:00	7:00	7:00		4 - 6 Peak Hour			16:45	16:30	16:30							
7 - 9 Pk Volume	0	0	218	49	267		4 - 6 Pk Volume	0	0	134	55	188							
Pk Hr Factor	0.000	0.000	0.574	0.817	0.612		Pk Hr Factor	0.000	0.000	0.859	0.655	0.783							

Prepared by National Data & Surveying Services

WB/EB Gap Study

Location: Borden Rd & Fulton Rd

City: San Marcos

Day: Wednesday

Date: 11/8/2017

TIME	DURATION (in seconds)						
7:00	12	5	34				
7:01	17	35	5				
7:02	5	5	10	15			
7:03	6	26					
7:04	5	24					
7:05	14						
7:06	6	34	7				
7:07	7	27					
7:08	6	6					
7:09	5	7	5	8			
7:10	5	5	8	9	7		
7:11	5	9					
7:12	6	5	5	18	20		
7:13	11	15					
7:14	6	6	22	9			
7:15	6	39					
7:16	6						
7:17	9	28	6	14	6		
7:18	5	12					
7:19	5	5	5	5			
7:20	8	11	23	21			
7:21	5	11					
7:22	22	15	7	11			
7:23							
7:24	24	8					
7:25	7	11	26				
7:26	7						
7:27	6	6	5	6	16	10	
7:28	5	9	5	9	22		
7:29	12						
7:30	8	38					
7:31	16						
7:32	6	9	20	6	7		
7:33	12						
7:34	7	9	8	18			
7:35							
7:36	9	21					
7:37	12	14	8	33			
7:38	10						
7:39	25	10	5				
7:40	7	5	34				

Prepared by National Data & Surveying Services

WB/EB Gap Study

Location: Borden Rd & Fulton Rd
City: San Marcos

Day: Wednesday
Date: 11/8/2017

TIME	DURATION (in seconds)						
7:41	10						
7:42	13	6	5	7	7	5	
7:43	9	6	7	5			
7:44	8	10	10	24			
7:45	9	17					
7:46	11	18					
7:47	9	56					
7:48							
7:49	6	14	9				
7:50	15	5					
7:51	7	8	8				
7:52	8	21					
7:53	5	5	5	7	46		
7:54							
7:55	30	21					
7:56	8	20					
7:57	6	14	29				
7:58	8	6	24				
7:59	7	9	6	55			
8:00	16						
8:01	5	5	6	28			
8:02	16						
8:03	7	22	7	19			
8:04	14	16					
8:05	14	29					
8:06	36						
8:07	5	12	21				
8:08	7	5	14	25			
8:09	12	13					
8:10	6	8	24	7	6		
8:11	7	15					
8:12	20	6	7	15			
8:13	29						
8:14	7	5	18				
8:15	33	6					
8:16	11	10	6	6	36		
8:17	15	9					
8:18	6	16					
8:19	18	15	7	8	5		
8:20	13						
8:21	10	6	7	58			
8:22	6	6					

Prepared by National Data & Surveying Services

WB/EB Gap Study

Location: Borden Rd & Fulton Rd
City: San Marcos

Day: Wednesday
Date: 11/8/2017

TIME	DURATION (in seconds)						
8:23	12	12	39				
8:24							
8:25	20	43					
8:26	5	9					
8:27	17	21	19				
8:28	10						
8:29	66						
8:30	7	7	40				
8:31	9	11					
8:32	6	8	6	16			
8:33	25	19					
8:34	12	14					
8:35	9	17	6	14			
8:36	11	21	13				
8:37	6	9	33	9			
8:38	10	8	9	19			
8:39	5	16	7	21			
8:40	11	37					
8:41	6						
8:42	32	5	9	22			
8:43	19	19					
8:44	5	31	15				
8:45	11	12					
8:46	7	7	6	16			
8:47	5	8	31				
8:48	5	5	21	7			
8:49	5	7	44				
8:50	5	29	5				
8:51	5	9	24				
8:52	11	16					
8:53	7	11					
8:54	20	24	13	11			
8:55	14	7	6	7			
8:56	5	8	16				
8:57	13	5	23	8			
8:58	5	12	9	12			
8:59	15	23					

ENGINEERING AND TRAFFIC SURVEY SUMMARY

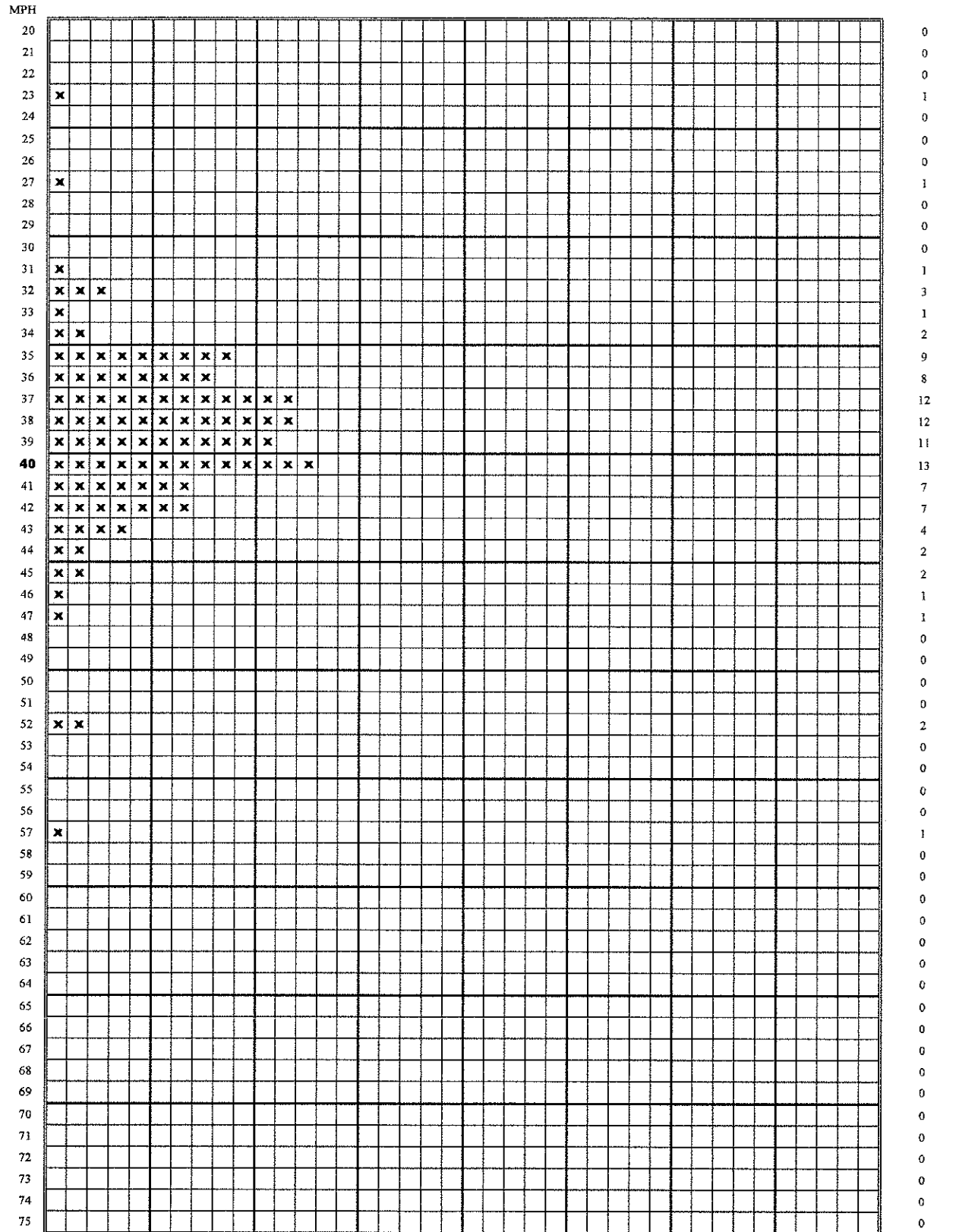
DATE OF SURVEY: 11/7/11
PREPARED BY: MH
REVIEWED BY: MR

A circular professional engineer seal for Michael D. Edwards, State of California. The seal contains the text: "REGISTERED PROFESSIONAL ENGINEER", "MICHAEL D. EDWARDS", "NO. 32977", "EXP. 6-30-2012", "CIVIL", and "STATE OF CALIFORNIA". There are two stars on the seal, one on each side of the word "CIVIL".

RADAR SPOT SPEED STUDY FIELD SHEET

LOCATION: Borden Rd. btwn Mulberry & Woodland APPROACH: WB/EB SURFACE: DRY
 DATE: 11/7/11 TIME: 1340-1403 WEATHER: Sunny/ Clear POSTED SPEED: 40 RECORDER: Matthew H

"X"= PASSENGER CARS "B"= BUSES "T"= TRUCKS



COMMENTS:

101

VEHICLE SPOT SPEED STUDY

RECORDER: Matthew H

LOCATION:

Borden Rd. btwn Mulberry & Woodland

APPROACH: WB/EB

SURFACE: DRY

WEATHER: Sunny/ Clear

DATE: 11/7/11

TIME: 1340-1403

SURVEY STATISTICS

POSTED SPEED: 40 MPH
AVERAGE SPEED: 39 MPH
MEDIAN SPEED: 38 MPH
(50th PERCENTILE)
MODAL SPEED: 40 MPH
85TH PERCENTILE SPEED: 41 MPH
10 MPH PACE: 34 - 43 MPH
PERCENT IN PACE: 84%
PERCENT ENFORCEABLE: 3%

COMMENTS:

POSTED SPEED **40**

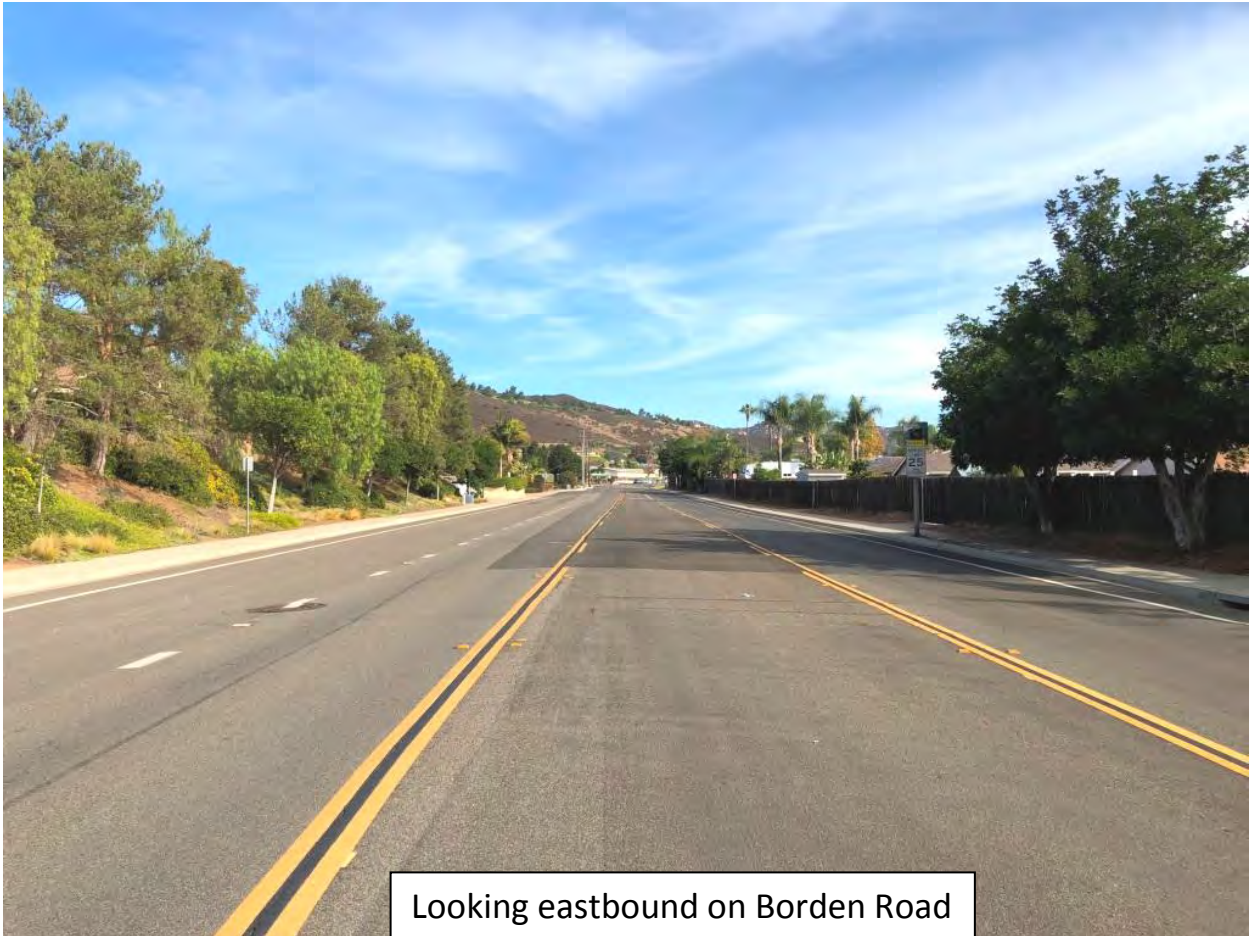
SPEED RANGES	NUMBER OF VEHICLES	PERCENT OF TOTAL	PERCENT ACCUMULATION
20	0	0.0%	0.0%
21	0	0.0%	0.0%
22	0	0.0%	0.0%
23	1	1.0%	1.0%
24	0	0.0%	1.0%
25	0	0.0%	1.0%
26	0	0.0%	1.0%
27	1	1.0%	2.0%
28	0	0.0%	2.0%
29	0	0.0%	2.0%
30	0	0.0%	2.0%
31	1	1.0%	3.0%
32	3	3.0%	5.9%
33	1	1.0%	6.9%
34	2	2.0%	8.9%
35	9	8.9%	17.8%
36	8	7.9%	25.7%
37	12	11.9%	37.6%
38	12	11.9%	49.5%
39	11	10.9%	60.4%
40	13	12.9%	73.3%
41	7	6.9%	80.2%
42	7	6.9%	87.1%
43	4	4.0%	91.1%
44	2	2.0%	93.1%
45	2	2.0%	95.0%
46	1	1.0%	96.0%
47	1	1.0%	97.0%
48	0	0.0%	97.0%
49	0	0.0%	97.0%
50	0	0.0%	97.0%
51	0	0.0%	97.0%
52	2	2.0%	99.0%
53	0	0.0%	99.0%
54	0	0.0%	99.0%
55	0	0.0%	99.0%
56	0	0.0%	99.0%
57	1	1.0%	100.0%
58	0	0.0%	100.0%
59	0	0.0%	100.0%
60	0	0.0%	100.0%
61	0	0.0%	100.0%
62	0	0.0%	100.0%
63	0	0.0%	100.0%
64	0	0.0%	100.0%
65	0	0.0%	100.0%
66	0	0.0%	100.0%
67	0	0.0%	100.0%
68	0	0.0%	100.0%
69	0	0.0%	100.0%
70	0	0.0%	100.0%
71	0	0.0%	100.0%
72	0	0.0%	100.0%
73	0	0.0%	100.0%
74	0	0.0%	100.0%
75	0	0.0%	100.0%
TOTAL VEHICLES: 101			



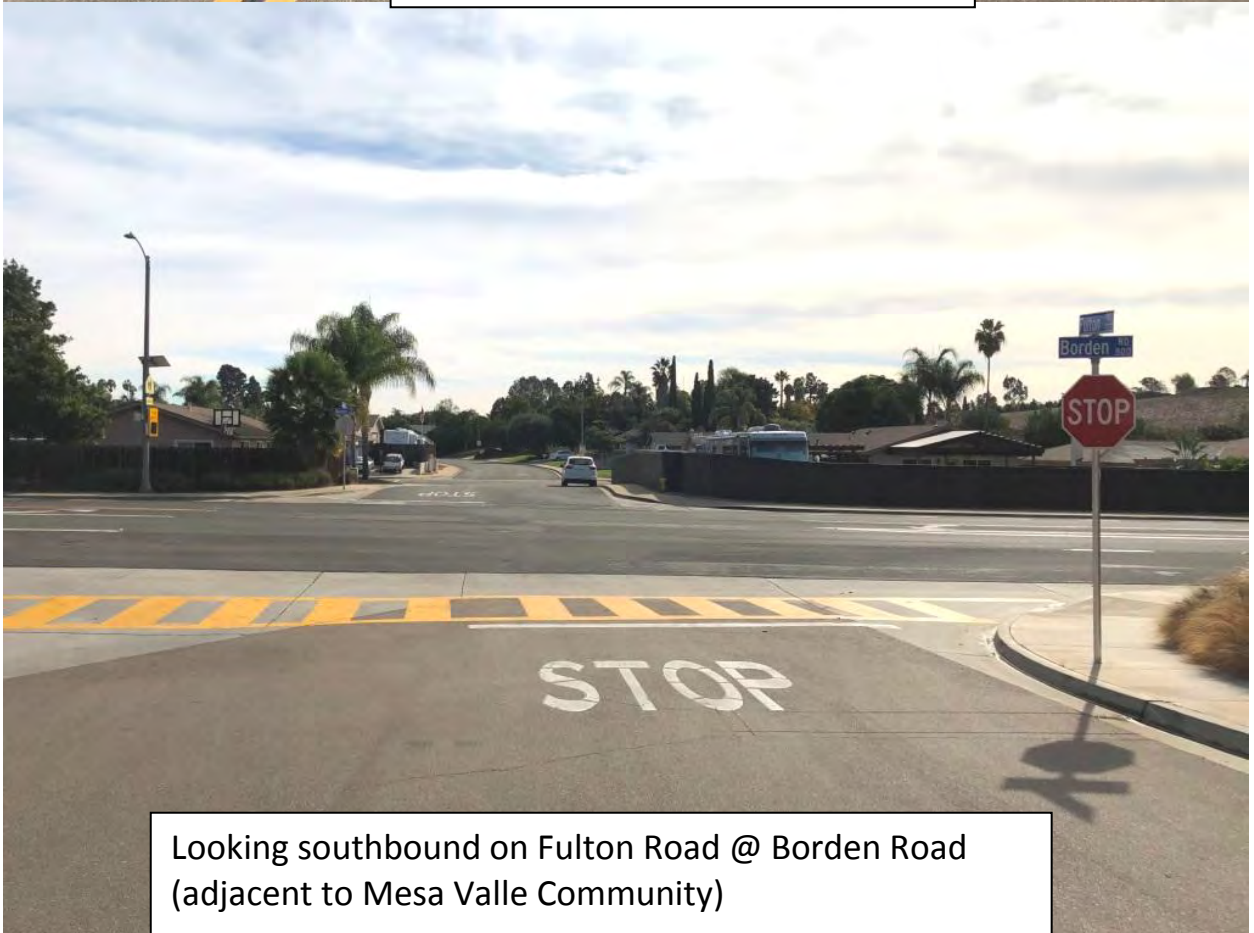
Westbound on Borden Road @ Red Hill Lane (2-lanes)



Westbound Borden Road approaching Fulton Road (No. 2 through lane traps into a right turn lane)



Looking eastbound on Borden Road



Looking southbound on Fulton Road @ Borden Road
(adjacent to Mesa Valle Community)



Looking east on Borden Road at Fulton Road (north side)



Looking west on Borden Road at Fulton Road (north side)



Westbound Borden Road @ Fulton Road (acceleration lane onto Borden Road)



Looking northbound on Fulton Road @ Borden Road
(north of Catherine Avenue)





Trail path on north side of Borden Road, west of Fulton Road



Trail path on south side of Borden Road, west of Fulton Road



Looking east on Borden Road at trail path (north side)



Looking west on Borden Road at trail path (north side)