

AGENDA

Meeting of the San Marcos Traffic Commission

Meeting Date: MAY 5, 2021 | **Meeting Time:** 6:00 PM

Location: Teleconference and Electronic Means

Pursuant to Governor Newsom's Executive Order N-29-20 dated March 17, 2020, and Executive Order N 33-20 dated March 19, 2020, issued with respect to the COVID-19 pandemic, this Traffic Commission meeting will be conducted utilizing teleconferencing and electronic means. In the interest of reducing the spread of COVID-19, members of the public may only call in to hear the meeting and may not be present in the Council Chamber. The public will dial using your phone to 1-877-309-2073 and enter Access Code: 543-671-309

Public Comment: To submit a public comment at the Traffic Commission meeting, please email gjackson@san-marcos.net and write "Public Comment" in the subject line, or identify the number of the Agenda item on which you are commenting. In the body of the email, include the item number and/or title of the item as well as your comments. Email comments on matters not on the agenda must be submitted prior to the time the Chair calls the Oral Communications item. Email comments on any agenda item must be submitted prior to the time the Chair closes public comments on the agenda item. Please be advised that all emailed comments are subject to the same rules as would otherwise apply to speaker comments at any Traffic Commission meeting, and that electronic comments on agenda items for this meeting may only be submitted by email. Comments via text message and/or social media (Facebook, Twitter, Instagram, etc.) will not be accepted.

The Traffic Commission Secretary will read all email comments, provided that the reading will not exceed five (5) minutes, or such other time as the Chair may provide, consistent with its ability to set time parameters for public comment at the Traffic Commission meeting. If persons submitting comments do not want their comment to be read out loud at the meeting (not to exceed five minutes), they should write "Do Not Read Out Loud at Meeting" at the top of the email. All emailed comments received by 4:00 pm will be provided to the Traffic Commission members and included as "Supplemental information" on the City's website prior to the meeting. Those comments received after 4:00 pm and prior to the close of public comment on the applicable agenda item will be added to the record and will be shared with the Traffic Commission members at the meeting.

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.

Agendas: Agenda packets are available for public inspection 72 hours prior to scheduled meetings at the Information Desk counter located on the first floor of City Hall, 1 Civic Center Drive, San Marcos, during normal business hours or online at www.san-marcos.net.

Agenda-related writings or documents provided to a majority of the Commission after distribution of the agenda packet will be available for public inspection at the time of distribution at the Information Desk counter located on the first floor of City Hall, 1 Civic Center Drive, San Marcos, CA, during normal business hours.

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

March 03, 2021

6. OLD BUSINESS

a. None

7. NEW BUSINESS

a. Traffic Signing and Striping Improvements – Mulberry Drive and Rose Ranch Road Intersection

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



City of San Marcos
1 Civic Center Drive
San Marcos, CA 92069

ADJOURNMENT

AFFIDAVIT OF POSTING

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

I, Gina Jackson, Secretary, San Marcos Traffic Commission, hereby certify that I caused the posting on April 29, 2021 of this agenda in the glass display case at the north entrance of City Hall.

DATED: April 29, 2021

Gina Jackson,
Traffic Commission Secretary

MINUTES

Meeting of the San Marcos Traffic Commission

WEDNESDAY, MARCH 3, 2021 | 6:00 PM

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

CALL TO ORDER:

Chairman Rico called the Traffic Commission Meeting to order at 6:00 p.m.

PLEDGE OF ALLEGIANCE:

Led by Commissioner Carroll

ROLL CALL:

PRESENT: COMMISSIONERS: RICO*, KOVRIG*, ERICKSON*, HOAGLIN*, HANSEN*, CARROLL*, FREEMAN*

ABSENT: COMMISSIONERS: BRIDGE, SCHELLENGER

*Members of the Traffic Commission attending the meeting via teleconference pursuant to Governor Newsom's Executive Order N-25-20.

ALSO PRESENT:

Senior Traffic Engineer, Mike Rafael; Principal Traffic Engineer, Nicholas Abboud; Sergeant, Charles Morreale; Traffic Commission Secretary, Aurelia Velasquez and new Traffic Commission Secretary, Gina Jackson.

ORAL COMMUNICATIONS:

The following residents emailed comments. Comments read out loud by Chair Rico:

Nashielly Vasquez – light turning left into Double Peak School skips cycles even after an engineer came out to fix the issue, install a "NO RIGHT TURN ON RED" sign for the light from San Elijo Hills side during school drop off and pick up hours.

Dawn Sitler – concerned for the safety on roads surrounding Walnut Grove Park. Concerns include; no speed limit signs on Sycamore Drive, drivers not reducing their speed when turning onto Sycamore Drive, narrow road with no bike lanes, large commercial nursery truck overnight parking on street.

Debra Wright – safety issues with the Smilax project; triple parked cars in front of NO PARKING-TOW AWAY signs, vehicles parking under the overpass, no place to walk but in the street with speeding traffic.

Chairman Hoaglin asked if it was possible to have staff place the issues from the public comments to a future meeting.

City Staff responded that the sign request at Double Peak School and the Smilax parking issue under the 78 bridge will be placed on a future meeting. The Walnut Grove issue is under County jurisdiction, but will contact the County.

APPROVAL OF MINUTES – FEBRUARY 3, 2021

Commissioner Kovrig makes a motion to accept the minutes as recorded. Commissioner Hansen seconds the motion. Motion carries.

AYES: COMMISSIONERS: RICO, KOVRIG, ERICKSON, HOAGLIN, HANSEN, CARROLL, FREEMAN

NOES: COMMISSIONERS: NONE

ABSENT: COMMISSIONERS: BRIDGE, SCHELLENGER

ABSTAINS: COMMISSIONERS: NONE

OLD BUSINESS

A. Melrose Drive – Request for Bike Shared Lane Markings (Sharrows) – Update:

At the November 2020 Traffic Commission meeting, Engineering staff recommended installation of bike shared lane markings (Sharrows) on Melrose Drive between San Elijo Road and Boulderidge Drive to improve bicycle operations and enhance motorists' awareness of bicyclists riding and taking full control of the outside travel lanes. The original request for bike lane sharrows on Melrose drive were from bicyclists that normally commute in San Marcos. However, the Traffic Commission felt that the proposed bike sharrows may be disruptive to vehicular traffic and provide a false sense of security for bicyclists especially novice riders. The Traffic Commission directed staff to obtain additional traffic data (traffic and bicycle volume, speed, and collision statistics) in order to make an informative decision on the proposed installation of the sharrows on Melrose Drive.

RECOMMENDATION

Engineering staff requests that the Traffic Commission accept staff's recommendations for the installation of bike shared lane markings (Sharrows) on Melrose Drive between San Elijo Road and Boulderidge Drive. The new sharrows will be installed within the roadway segment (6-feet from face of curb) adjacent to the existing "BICYCLES MAY USE FULL LANE" regulatory signs currently installed within

the public right-of-way. Engineering staff also recommends selective enforcement by the Sheriff's Department of the "BICYCLES MAY USE FULL LANE" regulatory signs and the new sharro pavement markings on Melrose Drive.

Senior Civil Engineer Mike Rafael presented the staff report and presentation.

PUBLIC COMMENTS

Eric Wiebe – submitted an email comment in support of staff's recommendation to add Sharro pavement markings. The comment was read out loud by Chair Rico.

COMMISSIONER DISCUSSION INCLUDED: install a "Bike Lane Ends" sign on Melrose towards San Elijo from Rancho Santa Fe; use green paint under white markings for bike lanes to be more visible; consider potential new projects going in before moving forward with reducing travel lanes; location of Sharrows; and any traffic data counts pre-COVID.

CITY STAFF responded that they will look into adding the "Bike Lane Ends" sign on Melrose, as other parts of the city have those signs. The city has not gone the route of getting approval of the green indications for bike lanes or anything green. At this time we will stay with our current practice. A project is being submitted to our CIP program to restripe this roadway to one lane in each direction. The Sharrows will be placed on the outside lanes adjacent to the signs. Pre-COVID traffic counts in 2018/2019 was 13,600 vehicles per day. Current count is 8000 vehicles per day. The area is designed for up to 28,000 vehicles per day.

Commissioner Kovrig made a motion to adopt staff's recommendation. Commissioner Hoaglin seconded the motion. Motion carries.

AYES: COMMISSIONERS: RICO, KOVRIG, ERICKSON, HOAGLIN, HANSEN, CARROLL, FREEMAN

NOES: COMMISSIONERS: NONE

ABSENT: COMMISSIONERS: BRIDGE, SCHELLENGER

ABSTAINS: COMMISSIONERS: NONE

NEW BUSINESS

None

REPORTS AND INFORMATION ITEMS

A. Engineering Staff Updates:

1. Speed Cushion Pilot Project – Staff received previous requests from residents to install speed bumps to reduce speeding in residential neighborhoods, however for years Fire Department has not approved the use of speed bumps due to delays in emergency response times. We looked into speed cushions, which allows passage of emergency vehicles and have been implemented by neighboring cities, such as Carlsbad and Encinitas. The city is considering the use of speed cushions as an alternative traffic calming measure for residential neighborhoods. The city hired a traffic engineer consultant to assist in developing a speed cushion pilot program, design standards, guidelines, and procedures.
2. **Chen Ryan & Associates Transportation Engineer Jonathan Sanchez** gave the presentation regarding his research and analysis on speed cushions.

COMMISSIONER DISCUSSION INCLUDED: inquiry on the proposed speed cushion location from Quiet Hills to Bennett from the top of the hill; glad the development of a policy is being done to give criteria to work with for staff; will other methods such as curving roads to slow traffic and narrowing of lanes be used after this pilot program; and an inquiry why Fulton to Bordan, between Richland was not included.

CITY STAFF responded that the proposed speed cushion would be about 300 feet from the top of hill from Quiet Hill to Bennett. The policy being worked on will be tailored to the city, as input from residents and other city staff is needed. At this time, the city is focused on adding speed cushions to residential areas to reduce traffic that cuts through residential streets. Fulton and Bordan, between Richland was not included because it did not meet the 85th percentile minimum speed.

B. San Diego County Sheriff's Department Traffic Collision Summary And Accident Investigation Log

- (10) DUI/Alcohol Arrests
- (10) DUI Accidents
- (20) Injury Collisions
- (34) Non-Injury Collisions
- (21) Persons Injured
- (4) Pedestrian Collisions
- (4) Pedestrians Injured
- (1) Bicyclist Collision
- (1) Bicyclist Injury
- (1) Motorcycle Collision
- (1) Motorcyclists Injury

C. Traffic Commission Commentary:

Commissioner Kovrig thanked staff for the Traffic Commissioner Guidelines and asked if there are any policies on how the traffic signals are set. There was also someone in my neighborhood over the weekend painting house numbers on the curbs and not sure if he had permission from the city to do so.

City staff responded that when you see lagging left it is because a leading left will happen. These are customized actions based on the speed of the roadway, how heavy the side street are and how much green time it will take. The goal is to maximize the green band, which is the number of seconds that are available for cars to cross the intersection during a green band period. Signal timing is determined by existing counts and location. We use a modeling software to get an idea of how the signal will work and we run through several simulations. The city is upgrading to advanced controllers and drivers will be seeing improvements to the signals throughout the city.

Commissioner Rico asked if fog or other light motion affects the signal changes.

City staff responded that yes fog and incremental weather does have an affect on the signal changes. If the signal doesn't detect any vehicles it will switch to a timing sequence.

Commissioner Carroll asked if the amount of cars waiting affects how quickly the turning signals are triggered.

City Staff responded no it does not matter if there is a single vehicle or several. The signals are timed.

D. Staff Commentary:

Senior Civil Engineer Mike Rafael indicated that he was glad to receive feedback on the Commissioner Guidelines. The guidelines are a work in progress and we want to make sure it is updated with all the standards. The Traffic department has received traffic safety concerns from residents on Oleander and Smilax Rd. A public comment was read today regarding Smilax Rd. The other complaints are regarding high cut-through traffic, speeding, and truck traffic. The city does have some truck route restrictions on parts of Oleander. The Traffic department will be investigating the matter and determine if additional truck route restrictions are needed as well as additional traffic calming. These items will be on a future Traffic Commission meeting.

ADJOURNMENT:

Chairman Rico adjourned the meeting at 7:22 p.m.

ATTEST:

Gina Jackson, Secretary
Traffic Commission

Arturo Rico, Chairman
Traffic Commission

AGENDA REPORT

Meeting of the San Marcos Traffic Commission

MEETING DATE: May 5, 2021
AGENDA ITEM NO: 7A
SUBMITTED BY: Michael Rafael, P.E. – Senior Civil Engineer
APPROVED BY: Nic Abboud, P.E. – Principal Civil Engineer
SUBJECT: Traffic Signing and Striping Improvements - Mulberry Drive and Rose Ranch Road Intersection

BACKGROUND:

A pattern of vehicular collisions from 2017-2020 traveling in the northbound Mulberry Drive direction at the signalized intersection with Rose Ranch Road alerted Engineering staff to investigate. The reported collisions involved motorists that caused significant City property damage and injuries. Residents adjacent to the intersection were also recently interviewed and complained about the excessive speeding and red light running occurring at the intersection. Based on the recent collisions and residential concerns, Engineering staff initiated a traffic safety evaluation of the signalized intersection.

DISCUSSION:

The study focus is the signalized T-intersection of Mulberry Drive and Rose Ranch Road in the City of San Marcos (see attached Vicinity Map). Mulberry Drive from Borden Road to Rose Ranch Road is classified as a divided, three-lane collector street, approximately 0.60 miles long. Mulberry Drive consist of two (2) lanes in the northbound direction with a single in the southbound direction. The posted speed limit of this segment is 45 MPH and have sidewalks and 5-foot bike lanes on both sides. The existing street grade is approximately 6 percent uphill in the northbound direction towards the intersection. The signalized intersection sits at the vertical crest of the roadway. In addition, the roadway curves to the west in the northbound direction at the intersection. There is an existing northbound right-turn slip lane which is signalized to allow motorists to turn right into eastbound Rose Ranch Road when the traffic signal arrow indication is green. The traffic signal stops traffic for pedestrians crossing the right-turn slip lane and also stops traffic to allow southbound left turning traffic from Mulberry Drive to eastbound Rose Ranch Road.

Rose Ranch Road from Crimson Drive to Mulberry Drive is a two-lane, undivided residential collector street which is approximately 0.20 miles long. The posted speed limit of this segment is 40 MPH with no bike lanes and existing sidewalks on the south side. There is an existing short radius curve on the roadway heading westbound to the intersection which have several curve alignment warning and "CHEVRON" signs installed. The existing street grade is approximately 5 percent uphill in the westbound direction towards the intersection.

Engineering staff reviewed the collision history for the last three (3) years and found a total of six “Fixed Object” type collisions, and involved vehicles traveling in the northbound Mulberry Drive direction which resulted in property damage to the existing raised “pork chop” island and/or existing traffic signal poles. All reported collisions have been attributed to unsafe speeding, unsafe turning and DUI. There were no collisions that involved pedestrians or bicyclists at the intersection.

DATE	TIME	TYPE OF COLLISION	MOTOR VEHICLE INVOLVED WITH	MOVEMENT PRECEDING COLLISION	PRIMARY CAUSE OF COLLISION	PROPERTY DAMAGE/INJURIES
08/30/20	10:25 PM	HIT OBJECT	FIXED OBJECT	MAKING RIGHT TURN	DUI, UNSAFE TURN	YES/NO
08/02/20	4:18 AM	HIT OBJECT	FIXED OBJECT	MAKING RIGHT TURN	UNSAFE SPEED, DUI	YES/YES
05/23/20	4:42 AM	HIT OBJECT	FIXED OBJECT	MAKING RIGHT TURN	DUI	YES/NO
08/27/19	2:00 AM	HIT OBJECT	FIXED OBJECT	PROCEEDING STRAIGHT	DUI, UNSAFE TURN	YES/NO
04/10/19	9:48 PM	HIT OBJECT	FIXED OBJECT	RAN OFF ROAD	DUI, UNSAFE TURN, UNSAFE SPEEDING	YES/NO
10/24/18	9:35 AM	HIT OBJECT	FIXED OBJECT	MAKING RIGHT TURN	UNSAFE TURN	YES/NO

Engineering staff investigated if there was insufficient line of sight to the existing traffic signal heads at the intersection traveling on northbound Mulberry Drive. Per Table 4D-2 of the CAMUTCD, minimum sight distance for signal visibility on a 45 MPH speed limit roadway is 460 feet. Sight distance was determined to be approximately 1300 feet (at Vineyard Rd. cross street) which exceeds the minimum required value. Nighttime observation of the signalized intersection was also conducted and determined that lighting levels were adequate and not an issue with visibility to the signal heads.

Engineering staff conducted a ball bank study to determine the comfortable speeds for vehicles approaching the curved “porkchop” raised island inside the right-turn slip lane. Based on the data collection runs, a 15-MPH speed advisory limit is recommended. Vehicle speed tube counts were collected within the right-turn slip lane to determine the 85th percentile speed that motorists were driving as they approach the curved “porkchop” island. The geometric design of the “porkchop” island should discourage high speeds and turns. However, the collected data indicated an 85th percentile speed of 29 MPH which was significantly higher than the recommended speed advisory

limit of 15 MPH. Engineering staff also observed speeds using a radar speed gun and determined that speeds were averaging at least 35 MPH as motorists were approaching the raised “porkchop” island. Average Daily Traffic (ADT) volume of 550 vehicles per day (VPD) were also collected for the right-turn slip lane. The highest peak hour volume was 50 vehicles at 2 PM.

Based on its field investigation, Engineering staff noted that additional traffic warning signs and pavement markings for the existing right-turn slip lane in accordance with the CAMUTCD (Figure 3B-13) would be beneficial. In addition, motorists traveling on northbound Mulberry Drive could benefit from additional guidance on which lane to take for eastbound Rose Ranch Road. Therefore, Engineering staff recommends additional traffic signing and striping improvements consistent with CAMUTCD standards as low-cost effective countermeasures for reducing vehicular speeds, increasing speed awareness, and enhancing visibility of the intersection. Westbound Rose Ranch Road towards Mulberry Drive has additional curve warning signs and pavement markings that inform motorists of the upcoming curved roadway section. Engineering staff recommends traffic signing and striping improvements be installed at the intersection of Mulberry Drive and Rose Ranch Road to include the following:

- 1) A five-foot bike lane extended through the right-turn slip lane on northbound Mulberry Drive to assist in channelizing vehicular through traffic.
- 2) Installation of painted gore area to separate traffic for northbound Mulberry Drive from the existing right-turn slip lane.
- 3) Installation of left edgeline (yellow) adjacent to the raised “porkchop” island to improve visibility of the limit of travel way.
- 4) Installation of new right turn pavement arrows in the right-turn slip lane.
- 5) Installation of new advance curve warning sign with a supplementary 15-MPH speed advisory plaque.
- 6) Installation of new curve alignment warning signs “Chevrons” to delineate the curved raised island and roadway.

Engineering staff also reviewed alternative improvements to help reduce vehicular speeding in the right-turn slip lane, including active flashing beacons, rumble strips, and raised crosswalks. However, these devices are not recommended as a first measure of intervention. In addition, a “Rest-on-Red” traffic signal operation was also considered as an alternative measure to force motorists to come to a full stop at the terminus of the right-turn slip lane, thereby reducing their turning speeds. The “Rest-on-Red” operation would likely be implemented during off-peak, nighttime periods. Residents may not be in support of this type of signal operation due to increased noise levels associated with vehicles coming to stop. Engineering staff recommends the additional traffic signing and striping enhancements as a first step in reducing vehicular speeds and improving overall travel safety. Engineering staff plans to monitor traffic and driver behavior once these improvements are implemented for at least (1) year before determining if other alternatives would need to be evaluated.

As a longer-term solution, Engineering staff plans to evaluate this signalized intersection for a potential conversion to a modern roundabout. The observed low traffic volumes and the size of the intersection make it possible to incorporate a standard roundabout. Staff will be hiring an engineering consultant to develop a roundabout feasibility study. The findings and recommendations of such a study will be presented at a future Traffic Commission meeting.

Last month, the City was awarded federal funds through the Highway Safety Improvement Program (HSIP) to install new retroreflective backplates at all traffic signals citywide. This intersection would be a beneficiary of this citywide project as it would enhance the visibility of the traffic signals. Construction is expected to start in the next couple of years.

CONCLUSION AND RECOMMENDATIONS:

Engineering staff requests that the Traffic Commission approves staff's recommendations for the installation of additional traffic signing and striping improvements consistent with CAMUTCD standards as low-cost and effective countermeasures for reducing vehicular speeds. The improvements are expected to warn drivers of the roadway curvature, and enhance visibility of the intersection.

Engineering staff recommends that the following traffic signing and striping improvements be installed at the intersection of Mulberry Drive and Rose Ranch Road:

- 1) A five-foot bike lane extended through the right-turn slip lane on northbound Mulberry Drive to assist in channelizing vehicular through traffic.
- 2) Installation of painted gore area to separate traffic for northbound Mulberry Drive from the existing right-turn slip lane.
- 3) Installation of left edgeline (yellow) adjacent to the raised "porkchop" island to improve visibility of the limit of travel way.
- 4) Installation of new right turn pavement arrows in the right-turn slip lane.
- 5) Installation of new advance curve warning sign with a supplementary 15-MPH speed advisory plaque.
- 6) Installation of new curve alignment warning signs "Chevrons" to delineate the curved raised island and roadway.

Engineering staff also recommends intermittent enforcement by the Sheriff's Department to help reduce red-light running and excessive speeding through the intersection.

TRAFFIC DATA/ROADWAY INFORMATION:

Traffic Volumes:

Mulberry Drive, Borden Road to Rose Ranch Road –3,893 VPD (vehicles per day, 2019).

Rose Ranch Road, Crimson Road to Rose Ranch Road –3,318 VPD (vehicles per day, 2019).



City of San Marcos
1 Civic Center Drive
San Marcos, CA 92069

Speed Limit:

Mulberry Drive, Borden Road to Rose Ranch Road, 45 MPH, posted.
Rose Ranch Road, Crimson Road to Rose Ranch Road, 40 MPH, posted.

ATTACHMENT(S)

Vicinity Map

Existing Conditions/Proposed Recommendations Exhibit

Speed/Volume Tube Counts (Right-turn slip lane on Mulberry Drive)

Ball Bank Exhibit (Right-turn slip lane on Mulberry Drive)

Sight Distance Exhibit (Signal Head Visibility)

Average Daily Traffic (ADT) counts (Mulberry Drive, Rose Ranch Road)

CAMUTCD Figure 3B-13, Lane Line Markings at Intersections

Pedsafe – Improved Right-Turn Slip Lane Design Guidelines

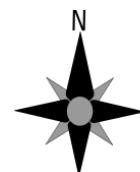
Photos



VICINITY MAP

TRAFFIC SIGNING/STRIPING IMPROVEMENTS – MULBERRY DR. @ ROSE RANCH RD.

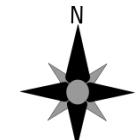
AGENDA ITEM #7A – MAY 2021



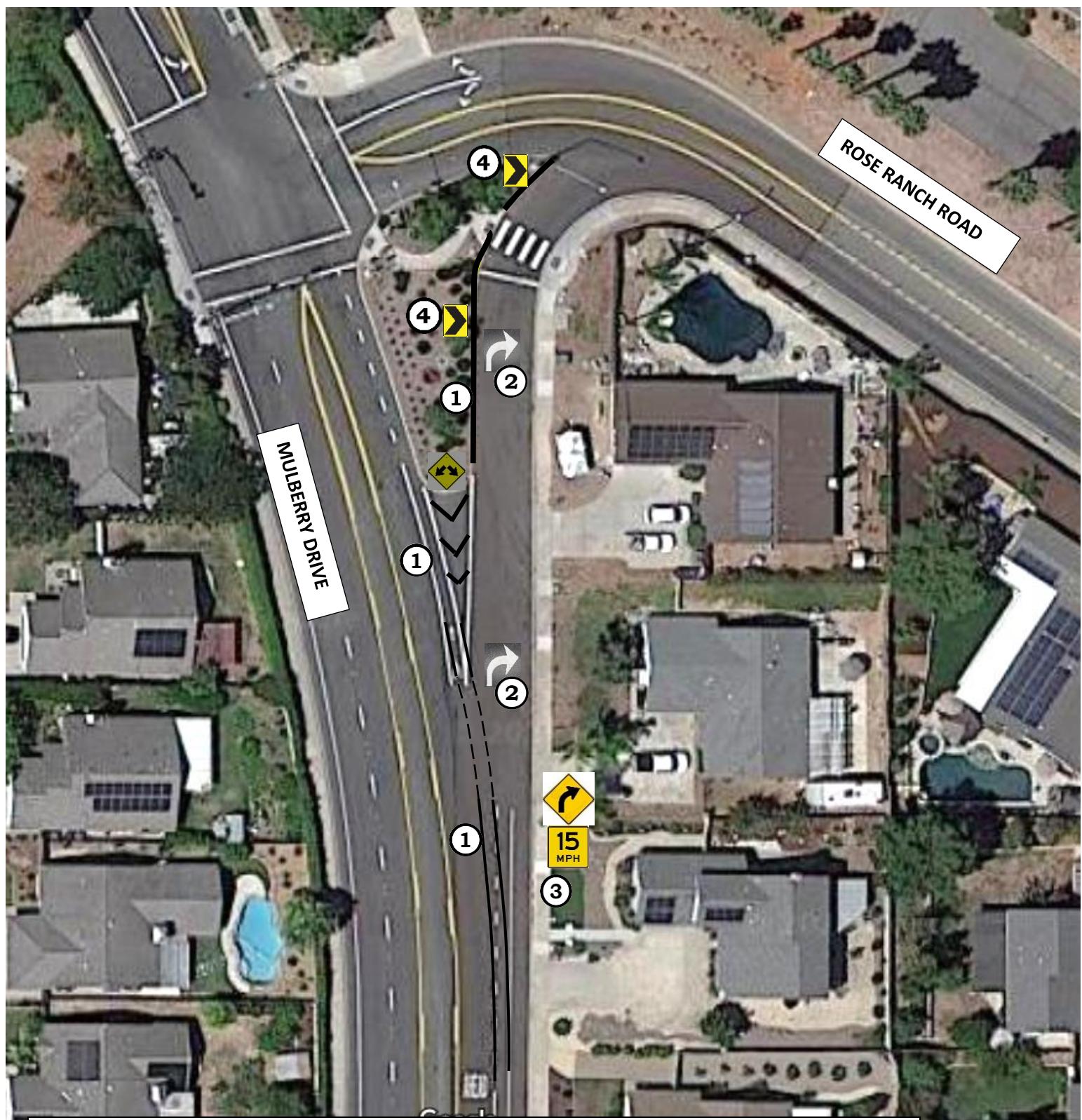
*NOT TO SCALE



**EXISTING TRAFFIC CONDITIONS
MULBERRY DRIVE @ ROSE RANCH ROAD
AGENDA #7A - MAY 5, 2021 TRAFFIC COMMISSION MEETING**



*NOT TO SCALE



CONSTRUCTION NOTES:

- ① EXTEND 5' BIKE LANE THROUGH RIGHT-TURN SLIP LANE; INSTALL PAINTED GORE; INSTALL LEFT EDGE LINE (YELLOW)
- ② INSTALL NEW TYPE IV RIGHT TURN ARROWS PER CAMUTCD (QTY. 2)
- ③ INSTALL NEW ADVANCED CURVE WARNING SIGN W/15 MPH SPEED ADVISORY SPEED LIMIT (W1-1a) ON NEW BREAKAWAY POST
- ④ INSTALL NEW "CHEVRON" (W1-8) CURVE WARNING SIGNS (QTY. 2) ON NEW BREAKAWAY POST



*NOT TO SCALE

**PROPOSED TRAFFIC SIGNING/STRIPING IMPROVEMENTS
MULBERRY DRIVE @ ROSE RANCH ROAD
AGENDA #7A - MAY 5, 2021 TRAFFIC COMMISSION MEETING**

SPEED

NB Mulberry Dr Right Turn Ln S/O Rose Ranch Dr

Day: Tuesday

Date: 4/20/2021

City: San Marcos

Project #: CA21_040069_001

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	3	0	0	0	0	0	0	0	0	0	3
05:00	0	0	5	4	0	0	0	0	0	0	0	0	0	9
06:00	0	0	7	6	1	0	0	0	0	0	0	0	0	14
07:00	1	3	27	8	1	0	0	0	0	0	0	0	0	40
08:00	2	2	20	14	1	0	0	0	0	0	0	0	0	39
09:00	0	1	11	6	1	0	0	0	0	0	0	0	0	19
10:00	0	4	17	13	2	0	0	0	0	0	0	0	0	36
11:00	1	4	13	18	1	0	0	0	0	0	0	0	0	37
12:00 PM	0	3	15	27	2	0	0	0	0	0	0	0	0	47
13:00	0	1	12	22	2	0	0	0	0	0	0	0	0	37
14:00	0	7	15	22	6	0	0	0	0	0	0	0	0	50
15:00	1	5	7	22	1	0	0	0	0	0	0	0	0	36
16:00	3	4	16	16	4	0	0	0	0	0	0	0	0	43
17:00	0	5	18	14	4	0	0	0	0	0	0	0	0	41
18:00	0	0	8	16	2	0	0	0	0	0	0	0	0	26
19:00	1	5	13	11	0	0	0	0	0	0	0	0	0	30
20:00	0	2	6	7	2	0	0	0	0	0	0	0	0	17
21:00	0	1	5	6	0	0	0	0	0	0	0	0	0	12
22:00	0	0	5	5	0	0	0	0	0	0	0	0	0	10
23:00	0	0	1	2	0	0	0	0	0	0	0	0	0	3
Totals	9	47	221	242	31									550
% of Totals	2%	9%	40%	44%	6%									100%

AM Volumes	4	14	100	72	8	0	0	0	0	0	0	0	0	198	
% AM	1%	3%	18%	13%	1%									36%	
AM Peak Hour	08:00	10:00	07:00	11:00	10:00									07:00	
Volume	2	4	27	18	2									40	
PM Volumes	5	33	121	170	23	0	0	0	0	0	0	0	0	352	
% PM	1%	6%	22%	31%	4%									64%	
PM Peak Hour	16:00	14:00	17:00	12:00	14:00									14:00	
Volume	3	7	18	27	6									50	
Directional Peak Periods		AM 7-9				NOON 12-2				PM 4-6				Off Peak Volumes	
All Speeds		Volume		%		Volume		%		Volume		%		Volume	%
		79	↔	14%		84	↔	15%		84	↔	15%		303	55%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	ADT
Mulberry Dr	Summary	21	25	25	29	31	550

BALL BANK WORKSHEET

Road Name:	Mulberry Drive - Northbound free right turn lane
Municipality:	City of San Marcos
Date/Time:	04/15/21
Driver:	MR
Observer:	MR
Vehicle:	SUV
Weather:	Clear, Sunny
Surface condition:	Dry
Speed Limit:	45

Speed Range	Maximum Ball Bank Reading
≤ 24 mph	16 degrees
25-34 mph	14 degrees
35-49 mph	12 degrees
≥ 50 mph	10 degrees

# of Curves	Advisory Speed (mph)		
	Less than or equal 20 mph	25 or 30 mph	Greater than or equal 35 mph
1	W1-1 	Turn or Curve signs may be used.* 	
2	W1-3 		W1-4 
3 or more	W1-5 		



* The decision should be based on the geometry and general appearance of the particular curve(s)

MINIMUM SIGHT DISTANCE FOR SIGNAL VISIBILITY EXHIBIT

MULBERRY DRIVE @ ROSE RANCH ROAD

AGENDA #7A - MAY 5, 2021 TRAFFIC COMMISSION MEETING

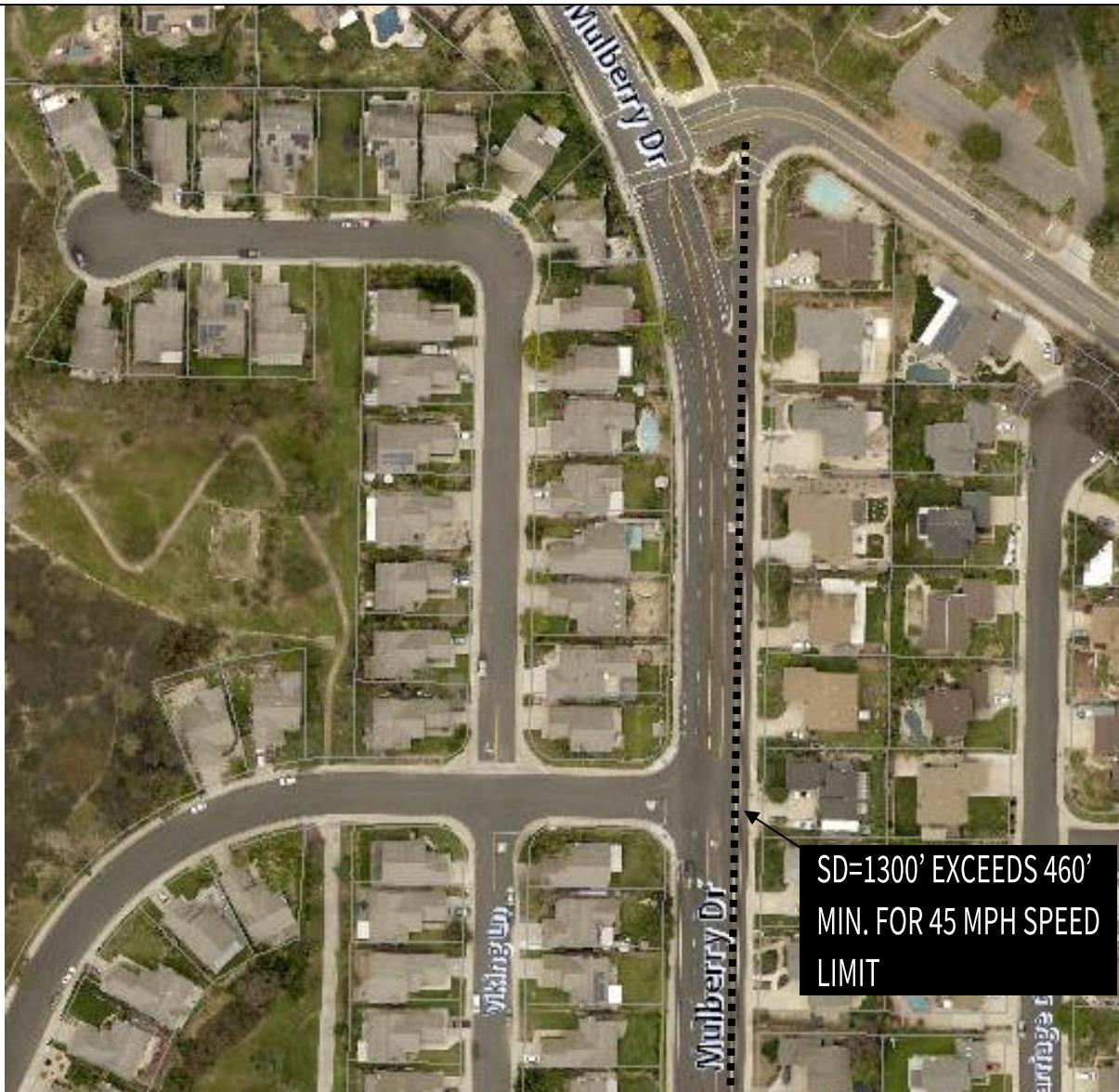


Table 4D-2. Minimum Sight Distance for Signal Visibility

85th-Percentile Speed	Minimum Sight Distance
20 mph	175 feet
25 mph	215 feet
30 mph	270 feet
35 mph	325 feet
40 mph	390 feet
45 mph	460 feet
50 mph	540 feet
55 mph	625 feet
60 mph	715 feet

Note: Distances in this table are derived from stopping sight distance plus an assumed queue length for shorter cycle lengths (60 to 75 seconds).



VOLUME

Mulberry Dr Bet. Rose Ranch Rd & Borden Rd

Day: Tuesday
Date: 4/23/2019City: San Marcos
Project #: CA19_4124_095

DAILY TOTALS				NB 1,874	SB 2,019	EB 0	WB 0			Total 3,893			
AM Period	NB	SB	EB	WB	TOTAL		PM Period	NB	SB	EB	WB	TOTAL	
00:00	3	4			7		12:00	22	26			48	
00:15	1	1			2		12:15	54	28			82	
00:30	0	1			1		12:30	33	20			53	
00:45	0	4	1	7	11		12:45	17	126	21	95	38 221	
01:00	1	0			1		13:00	24	23			47	
01:15	1	0			1		13:15	20	18			38	
01:30	0	1			1		13:30	19	18			37	
01:45	1	3	0	1	4		13:45	32	95	29	88	61 183	
02:00	0	1			1		14:00	21	38			59	
02:15	1	0			1		14:15	18	42			60	
02:30	1	0			1		14:30	33	52			85	
02:45	1	3	2	3	6		14:45	32	104	45	177	77 281	
03:00	0	2			2		15:00	70	51			121	
03:15	4	0			4		15:15	54	87			141	
03:30	1	1			2		15:30	46	52			98	
03:45	2	7	1	4	11		15:45	35	205	39	229	74 434	
04:00	0	2			2		16:00	36	31			67	
04:15	1	3			4		16:15	44	33			77	
04:30	1	2			3		16:30	54	46			100	
04:45	2	4	4	11	15		16:45	38	172	45	155	83 327	
05:00	5	5			10		17:00	48	32			80	
05:15	4	9			13		17:15	53	38			91	
05:30	2	8			10		17:30	40	28			68	
05:45	7	18	22	44	62		17:45	26	167	35	133	61 300	
06:00	12	18			30		18:00	43	27			70	
06:15	11	22			33		18:15	27	34			61	
06:30	21	20			41		18:30	37	24			61	
06:45	13	57	30	90	147		18:45	19	126	20	105	39 231	
07:00	26	36			62		19:00	33	16			49	
07:15	31	48			79		19:15	27	17			44	
07:30	28	55			83		19:30	28	14			42	
07:45	27	112	62	201	313		19:45	27	115	17	64	44 179	
08:00	55	65			120		20:00	18	11			29	
08:15	58	81			139		20:15	21	13			34	
08:30	58	78			136		20:30	14	10			24	
08:45	28	199	51	275	474		20:45	18	71	14	48	32 119	
09:00	18	23			41		21:00	17	16			33	
09:15	16	19			35		21:15	12	7			19	
09:30	12	27			39		21:30	14	5			19	
09:45	21	67	24	93	160		21:45	3	46	4	32	7 78	
10:00	22	15			37		22:00	6	6			12	
10:15	17	20			37		22:15	3	6			9	
10:30	12	13			25		22:30	2	2			4	
10:45	16	67	23	71	138		22:45	5	16	3	17	8 33	
11:00	15	22			37		23:00	2	1			3	
11:15	22	18			40		23:15	1	1			2	
11:30	22	10			32		23:30	3	1			4	
11:45	24	83	22	72	155		23:45	1	7	1	4	2 11	
TOTALS	624	872			1496		TOTALS	1250	1147			2397	
SPLIT %	41.7%	58.3%			38.4%		SPLIT %	52.1%	47.9%			61.6%	

DAILY TOTALS				NB 1,874	SB 2,019	EB 0	WB 0			Total 3,893	
AM Peak Hour	08:00	07:45		07:45				PM Peak Hour	15:00	14:30	14:45
AM Pk Volume	199	286		484				PM Pk Volume	205	235	437
Pk Hr Factor	0.858	0.883		0.871				Pk Hr Factor	0.732	0.675	0.775
7 - 9 Volume	311	476	0	0	787	4 - 6 Volume	339	288	0	0	627
7 - 9 Peak Hour	08:00	07:45		07:45				4 - 6 Peak Hour	16:30	16:30	16:30
7 - 9 Pk Volume	199	286	0	0	484	4 - 6 Pk Volume	193	161	0	0	354
Pk Hr Factor	0.858	0.883	0.000	0.000	0.871	Pk Hr Factor	0.894	0.875	0.000	0.000	0.885

VOLUME

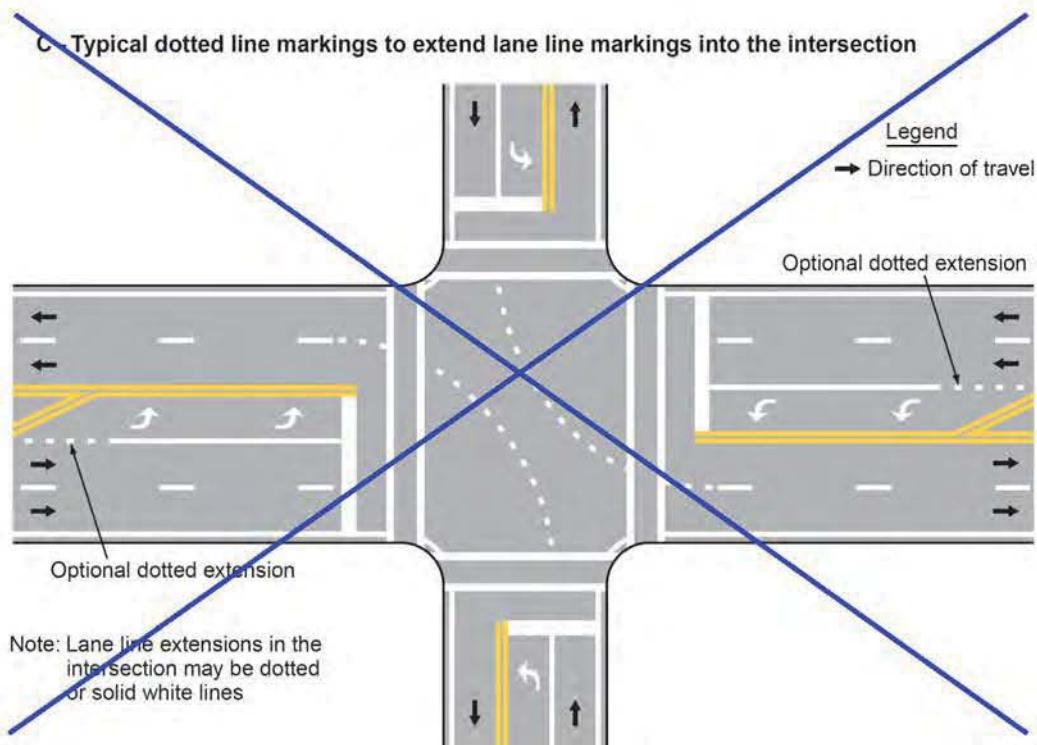
Rose Ranch Rd Bet. Mulberry Dr & Borden Rd

Day: Tuesday
Date: 4/23/2019City: San Marcos
Project #: CA19_4124_130

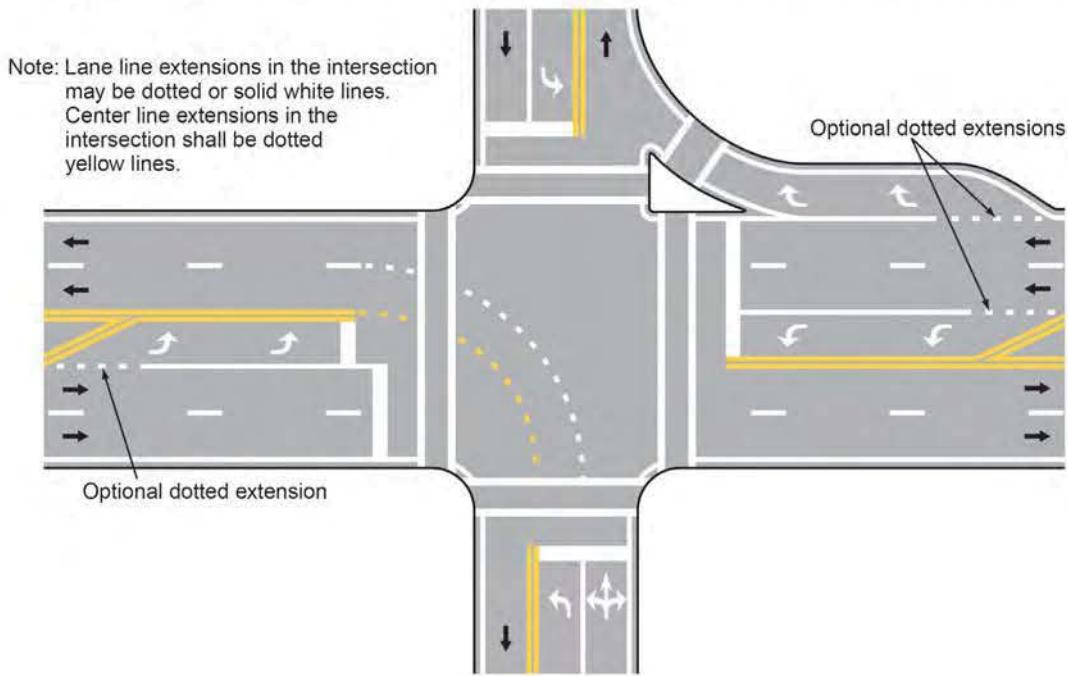
DAILY TOTALS				NB	SB	EB	WB					Total	
AM Period	NB	SB	EB	WB	TOTAL		PM Period	NB	SB	EB	WB	TOTAL	
00:00	3	2			5		12:00	22	12			34	
00:15	1	1			2		12:15	18	16			34	
00:30	0	0			0		12:30	18	12			30	
00:45	4	8	1	4	5	12	12:45	15	73	13	53	28 126	
01:00	1	0			1		13:00	15	17			32	
01:15	0	0			0		13:15	12	13			25	
01:30	1	1			2		13:30	11	24			35	
01:45	0	2	1	2	1	4	13:45	26	64	23	77	49 141	
02:00	1	0			1		14:00	13	20			33	
02:15	0	1			1		14:15	34	41			75	
02:30	0	0			0		14:30	52	33			85	
02:45	1	2	1	2	2	4	14:45	32	131	26	120	58 251	
03:00	1	2			3		15:00	41	26			67	
03:15	0	1			1		15:15	52	36			88	
03:30	1	0			1		15:30	29	41			70	
03:45	0	2	1	4	1	6	15:45	30	152	44	147	74 299	
04:00	1	1			2		16:00	40	33			73	
04:15	2	1			3		16:15	40	34			74	
04:30	1	4			5		16:30	42	56			98	
04:45	1	5	3	9	4	14	16:45	47	169	42	165	89 334	
05:00	2	5			7		17:00	33	43			76	
05:15	3	5			8		17:15	35	36			71	
05:30	4	2			6		17:30	39	50			89	
05:45	11	20	7	19	18	39	17:45	40	147	26	155	66 302	
06:00	6	20			26		18:00	32	23			55	
06:15	7	23			30		18:15	28	23			51	
06:30	8	30			38		18:30	16	10			26	
06:45	16	37	23	96	39	133	18:45	21	97	15	71	36 168	
07:00	14	30			44		19:00	14	17			31	
07:15	26	70			96		19:15	15	20			35	
07:30	62	84			146		19:30	16	17			33	
07:45	67	169	45	229	112	398	19:45	13	58	15	69	28 127	
08:00	47	45			92		20:00	10	7			17	
08:15	41	66			107		20:15	14	6			20	
08:30	48	61			109		20:30	15	9			24	
08:45	38	174	31	203	69	377	20:45	16	55	7	29	23 84	
09:00	19	19			38		21:00	7	13			20	
09:15	18	18			36		21:15	9	6			15	
09:30	19	15			34		21:30	7	4			11	
09:45	17	73	25	77	42	150	21:45	2	25	5	28	7 53	
10:00	16	22			38		22:00	4	3			7	
10:15	12	25			37		22:15	5	2			7	
10:30	10	14			24		22:30	4	2			6	
10:45	15	53	11	72	26	125	22:45	2	15	2	9	4 24	
11:00	12	19			31		23:00	3	3			6	
11:15	11	20			31		23:15	4	2			6	
11:30	12	19			31		23:30	1	2			3	
11:45	21	56	14	72	35	128	23:45	2	10	2	9	4 19	
TOTALS	601	789			1390		TOTALS	996	932			1928	
SPLIT %	43.2%	56.8%			41.9%		SPLIT %	51.7%	48.3%			58.1%	

DAILY TOTALS				NB	SB	EB	WB					Total
AM Peak Hour	07:30	07:15		07:30	PM Peak Hour	14:30	16:30					16:15
AM Pk Volume	217	244		457	PM Pk Volume	177	177					337
Pk Hr Factor	0.810	0.726		0.783	Pk Hr Factor	0.851	0.790					0.860
7 - 9 Volume	343	432	0	775	4 - 6 Volume	316	320	0	0			636
7 - 9 Peak Hour	07:30	07:15		07:30	4 - 6 Peak Hour	16:00	16:30					16:15
7 - 9 Pk Volume	217	244	0	457	4 - 6 Pk Volume	169	177	0	0			337
Pk Hr Factor	0.810	0.726	0.000	0.783	Pk Hr Factor	0.899	0.790	0.000	0.000			0.860

Figure 3B-13. Examples of Line Extensions through Intersections (Sheet 2 of 2)



D - Typical dotted line markings to extend center line and lane line markings into the intersection



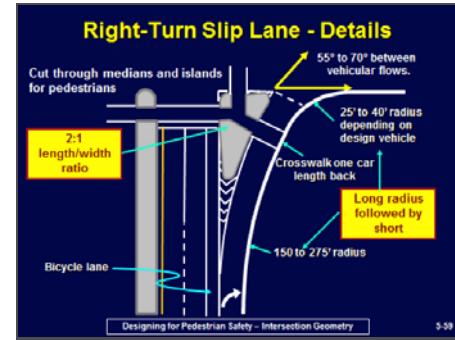


Improved Right-Turn Slip-Lane Design

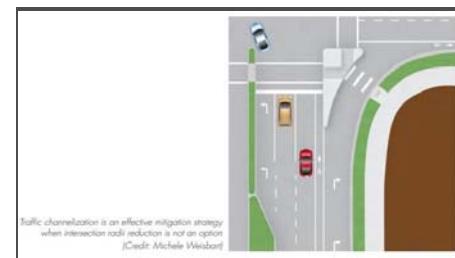
Well-designed right-turn slip lanes include several key features:

- The island (sometimes referred to as the “pork chop”) that forms the channelized right-turn lane is raised and large enough to accommodate waiting pedestrians and accessibility features, such as curb ramps or cut-throughs).
- As they enter the right-turn lane, drivers can easily see pedestrians crossing or about to cross the right-turn lane, and have enough space to stop completely once a pedestrian is spotted.
- The right-turn lane is as narrow as possible while still enabling the design vehicle to make the turn. Edge lines and with cross-hatching can be used to narrow the perceived width of the lane while still accommodating larger vehicles.
- The crosswalk is oriented at a 90 degree angle to the right-turn lane to optimize sight lines, and is positioned one car length back from the intersecting roadway to allow drivers to move forward and wait for a gap in oncoming traffic after clearing the crosswalk.
- The visibility of the crosswalk to drivers is further enhanced through the use of high-visibility crosswalk striping, flashing beacons, and/or signage. Raised crosswalks may also be used to force motorists to slow down.
- The angle at which the right-turn lane intersects the cross street is relatively low (e.g., closer to 110 percent, rather than 140 percent). This feature lowers motor vehicle speeds and makes it easier for drivers to see oncoming traffic.
- Good design can be recognized by the long “tail” on the island (i.e. long tail means slower turning speed; short tail means faster turning speed – see illustrations below).
- Acceleration lanes are not provided where the right-turn lane intersects the cross street. Acceleration lanes enable drivers to navigate the channelized right-turn lane at higher speeds than would be possible if drivers had to yield to cross street traffic.
- The needs of visually impaired pedestrians are considered as part of the design. For example, rumble strips placed in the right-turn lane can help visually impaired pedestrians judge whether drivers are yielding as they approach the crosswalk.

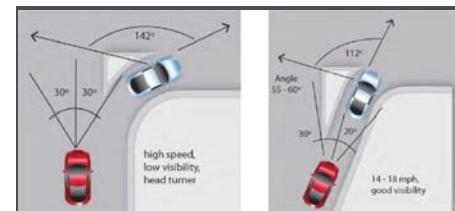
[View Other Roadway Design Treatments](#)



Recommended design for right-turn slip lane.



A well-designed right-turn slip-lane is an effective mitigation strategy when intersection radii reduction is not an option.



Shaper angles of slip lanes are important to slow cars and increase visibility.

- Active warning beacons may be desirable in locations where there are high traffic volumes and vehicle speeds.

Purpose

Well-designed right-turn slip lanes slow turning vehicles, allow drivers and pedestrians to easily see each other, reduce pedestrian exposure in the roadway, reduce the complexity of an intersection by breaking it into manageable parts, and allow drivers to see oncoming traffic as they merge into the receiving roadway. Right-turn slip lanes can be a detriment to pedestrian safety when they allow motorists to maintain high speeds through the turn, do not optimize sight lines to the crosswalk, and do not reduce the crossing distance for pedestrians.



A well-designed right turn slip lane at a complex intersection.

Source: *Designing for Pedestrian Safety*

Considerations

- Right-turn slip lanes are most appropriate at signalized intersections with higher volumes of right-turning vehicles or with geometrics (e.g., skewed) that make right turns infeasible for the design vehicle without substantially increasing pedestrian crossing distances.
- In some states, the slip lane must be stop-controlled.

Estimated Cost

Costs may vary substantially, depending on a variety of factors. For more information, see references ¹, ¹², ¹³, ¹⁴, and ¹⁵.

Case Studies

Looking northbound on Mulberry Drive towards Rose Ranch Rd.



Looking northbound on Mulberry Drive (inside right-turn slip lane)



Looking southbound on Mulberry Dr. from right-turn slip lane at traffic signal pole location



Looking southbound on Mulberry Drive towards Rose Ranch Rd.



Looking eastbound on Rose Ranch Road from Mulberry Dr.



Looking westbound on Rose Ranch Rd. towards Mulberry Dr.

