
**TRAFFIC
COMMISSION
REGULAR
MEETING**



**MARCH 19, 2014
7:00 PM**

AGENDA

Ed Rowe - Chair

Donald Froelich – Vice Chair

Michael Caputo - Commissioner

Steven Beeuwsaert - Commissioner

Rick Frazier - Commissioner

Location: City Council Chamber, 24035 El Toro Road, Laguna Hills, California 92653

Any person wishing to address the Traffic Commission on any matter, whether or not it appears on this Agenda, is asked to complete a "Request to Speak" form available on the table at the back of the Chamber. The completed form is to be submitted to the Recording Secretary prior to an individual being heard by the Traffic Commission.

Members of the public wishing to address the Traffic Commission can do so during the Public Comments portion of the Agenda with a time limitation of three minutes per person, an overall time limit of ten minutes for any one subject, and a total time limit of thirty minutes for Public Comments. If you are commenting on an Agenda item, your comments will be heard at the time that item is scheduled on the Agenda. If you are addressing the Commission on an item not listed on the Agenda, the Traffic Commission is prohibited by law from discussing or taking any action on that item.

CALL TO ORDER

Resolution No. 96-04-09-1 established rules of decorum for public meetings held by the City of Laguna Hills. Resolution No. 96-04-09-1 is available on the table at the back of the City Council Chamber.

PLEDGE OF ALLEGIANCE

ROLL CALL OF COMMISSION MEMBERS

1. ELECTION OF CHAIR

RECOMMENDATION: THAT THE TRAFFIC COMMISSION ELECT A NEW CHAIR.

2. ELECTION OF VICE CHAIR

3. PUBLIC COMMENTS

This is the time to address the Traffic Commission on any matter not listed on this Agenda that is within the subject matter jurisdiction of the Commission. Public Comments are limited to three minutes per person, an overall time limit of ten minutes for any one subject, and a total time limit of thirty minutes.

4. MINUTES**5. PRESENTATIONS****5.1 CITYWIDE ENGINEERING AND TRAFFIC SURVEY FOR SPEED LIMITS****6. ADMINISTRATIVE REPORTS****6.1 ALL-WAY STOP SIGN WARRANT ANALYSIS AT THE INTERSECTION OF BARBERA AT MARSALA**

RECOMMENDATION: THAT THE TRAFFIC COMMISSION RECEIVE AND FILE THE REPORT.

7. INFORMATIONAL ITEMS**7.1 ACCIDENT HISTORY AT THE INTERSECTION OF MOULTON PARKWAY AND LA PAZ ROAD****7.2 ORANGE COUNTY TRANSPORTATION AUTHORITY (OCTA) MEASURE M2 ENVIRONMENTAL CLEANUP PROGRAM UPDATE****7.3 SHERIFF'S DEPARTMENT VERBAL REPORT****7.4 RADAR SPEED TRAILER****8. COMMISSIONER COMMENTS****9. ADJOURNMENT**

The next Regular Meeting of the Traffic Commission will be May 21, 2014, at 7:00 PM, in the City Council Chamber, located at 24035 El Toro Road, Laguna Hills, California.

CERTIFICATION

I, HUMZA JAVED, Associate Civil Engineer of the City of Laguna Hills, do hereby certify that a copy of the foregoing Agenda was posted at Laguna Hills City Hall, Laguna Hills Community Center, and the Courtyard at La Paz Center by March 14, 2014, at 5:00 PM.



HUMZA JAVED
ASSOCIATE CIVIL ENGINEER

March 14, 2014

DATE

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, you should contact the office of the City Engineer at (714) 707-2650. Notification 48 hours prior to the meeting will enable the City to make reasonable arrangements to assure access.

Materials related to an item on this Agenda submitted to the Commission after distribution of the Agenda packet are available for public inspection in the Public Services Department at 24035 El Toro Road, Laguna Hills, California, during normal business hours.

**CITY OF LAGUNA HILLS, CALIFORNIA
TRAFFIC COMMISSION MEETING
MINUTES
JANUARY 15, 2014**

CALL TO ORDER

The Regular Meeting of the Traffic Commission of the City of Laguna Hills, California, was called to order by Chair Ed Rowe at 7:02 p.m. in the Laguna Hills City Council Chamber, 24035 El Toro Road, Laguna Hills.

PLEDGE OF ALLEGIANCE:

Chair Ed Rowe led the Pledge of Allegiance.

ROLL CALL OF COMMISSION MEMBERS:

Present: Ed Rowe, Chair
 Donald Froelich, Vice Chair
 Rick Frazier, Commissioner

Absent: Steven Beeuwsaert, Commissioner
 Michael Caputo, Commissioner

Staff Present: Humza Javed, Associate Civil Engineer; Cindy Sands,
 Administrative Assistant

1. **PUBLIC COMMENTS**
2. **MINUTES**

APPROVAL OF MINUTES

IT WAS MOVED BY COMMISSIONER DONALD FROELICH, SECONDED BY COMMISSIONER RICK FRAZIER, TO APPROVE THE MINUTES OF THE NOVEMBER 20, 2013, TRAFFIC COMMISSION MEETING.

The motion carried by the following vote:

AYES: Commissioner Frazier, Vice Chair Froelich, and Chair Rowe
NOES:
ABSENT: Commissioners Beeuwsaert and Caputo

3. PRESENTATIONS

None

4. ADMINISTRATIVE REPORTS

4.1 ON-STREET PARKING ON STOCKPORT STREET

Staff stated that a resident had contacted the City with concerns regarding parking issues for residents of the Alicia Village and Alicia Plaza Apartments located on Stockport Street. The resident described parking shortages within the department complexes and along public streets adjacent to the apartments and requested assistance from the City in alleviating some of the parking burden. Staff briefly reviewed the background information and history of the City's previous actions including the implementation of a permit parking program for employees of the Laguna Hills Dental Plaza on Laguna Hills Drive. As a result of the current request, staff reviewed parking restrictions along the adjacent public streets and determined that approximately one hundred and fifty feet of curb could be made available on Stockport Street to provide additional parking. Staff is recommending that the Traffic Commission recommend to the City Council the amendment of No Stopping Anytime Zones on portions of Stockport Street.

Mr. Mike Sanders, a resident of the Alicia Village Apartments, thanked Mr. Humza Javed for his time and stated his appreciation for the City's assistance with this issue.

MOTION WAS MADE BY COMMISSIONER FROELICH,
SECONDED BY COMMISSIONER FRAZIER, TO RECOMMEND
TO THE CITY COUNCIL THE AMENDMENT OF NO STOPPING
ANYTIME ZONES ON PORTIONS OF STOCKPORT STREET.

The motion carried by the following vote:

AYES: Commissioner Frazier, Vice Chair Froelich, and Chair
Rowe

NOES:

ABSENT: Commissioners Beeuwsaert and Caputo

4.2 SIDE STREET STOP SIGN ON RED CORRAL ROAD AT MUSTANG DRIVE

Staff stated that this item was continued from the meeting of November 20, 2013, per request of the Traffic Commission, to allow staff the opportunity to contact residents in the vicinity of Red Corral Road at Mustang Drive. The residents were requested to respond if they had any concerns with the installation of the stop sign. Letters were mailed to fifty-one residents in the vicinity and staff reported that three residents responded in opposition to the installation of a stop sign control.

Staff stated that originally a resident had contacted the City with a request to evaluate the need for an all-way stop control at the intersection of Mustang Drive at Red Corral Road. As a result of this request, the City's Consulting Traffic Engineers of Hartzog & Crabill, Inc. performed a multi-way stop sign analysis in accordance with the guidelines of the California Manual on Uniform Traffic Control Devices (MUTCD). Results of the analysis determined that this intersection does not meet the State standards for an all-way stop sign control; however, a side street stop sign is recommended based on the curvature of the roadway and speed of traffic on Mustang Drive.

Mr. Jack Noenickx, a resident of Red Corral Road, stated that he is in opposition to the installation of a side street stop sign on Red Corral Road at Mustang Drive and discussed his concerns with the Traffic Commission. Mr. Noenickx also stated that he believes the majority of residents would be opposed.

The Commission engaged in a discussion with staff and Mr. Noenickx regarding the stop sign analysis performed by Hartzog and Crabill, Inc., the results of the contact with residents, and the various issues presented by Mr. Noenickx.

MOTION WAS MADE BY COMMISSIONER FRAZIER, SECONDED BY CHAIR ROWE, TO RECOMMEND TO THE CITY COUNCIL THE INSTALLATION OF A STOP SIGN ON RED CORRAL ROAD AT MUSTANG DRIVE.

The motion carried by the following vote:

AYES: Commissioner Frazier, Vice Chair Froelich, and Chair Rowe
NOES:
ABSENT: Commissioners Beeuwsaert and Caputo

4.3 REGULATION OF PARKING IN CITY-OWNED PARKING LOTS

Staff stated that this item was continued from the meeting of November 20, 2013, per request of the Traffic Commission, to allow staff time to gather information requested by the Commission. Staff reported that the City has been experiencing issues with vehicles being left overnight in City-owned parking lots at City parks. As a result of this issue, the City performed a survey of the number of cars parked overnight at the Community Center from December 2, 2013, through December 7, 2013. Results of the survey revealed an average of 25 vehicles were parked nightly. The Community Center parking lot holds approximately 66 vehicles and all parking is needed for special events. Staff discussed the concerns brought up at the previous meeting regarding vehicles parked late at night due to events held at the Community Center and informed the Commission that the City has the flexibility to regulate the parking ordinance, when necessary, on a case-by-case basis. Staff is recommending the amendment of Chapter 11-12 of the LHMC.

MOTION WAS MADE BY COMMISSIONER FROELICH, SECONDED BY COMMISSIONER FRAZIER, TO RECOMMEND TO THE CITY COUNCIL THE AMENDMENT OF CHAPTER 11-12 OF THE CITY OF LAGUNA HILLS MUNICIPAL CODE TO PROHIBIT OVERNIGHT PARKING ON CITY-OWNED PARKING LOTS.

The motion carried by the following vote:

AYES: Commissioner Frazier, Vice Chair Froelich, and Chair Rowe
NOES:
ABSENT: Commissioners Beeuwsaert and Caputo

5. INFORMATIONAL ITEMS

5.1 SHERIFF'S DEPARTMENT VERBAL REPORT

Staff not available.

5.4 RADAR SPEED TRAILER

Staff submitted the schedule for the radar trailer.

6. COMMISSIONER COMMENTS

None.

7. ADJOURNMENT

There being no further business before the Traffic Commission at this session, Chair Rowe declared the meeting adjourned at 8:01 p.m. to the meeting of March 19, 2014.

Prepared by:

Approved by:

Humza Javed, P.E.
Associate Civil Engineer

Ed Rowe
Chair

**CITY OF LAGUNA HILLS
TRAFFIC COMMISSION
AGENDA REPORT
TRAFFIC ENGINEER DEPARTMENT**

**ISSUE: ALL-WAY STOP SIGN WARRANT ANALYSIS AT THE INTERSECTION
OF BARBERA AT MARSALA**

SUMMARY:

City staff received a request from a resident via Police Services to install an all-way stop control at the intersection of Barbera at Marsala. The reason for the request was to change the traffic control during drop-off and pick up hours at San Joaquin Elementary School. Upon review, it is determined that an all-way stop control is not warranted based on standard guidelines. However, in order to assist with children crossing the intersection, the City will discuss the option of adding a crossing guard at the intersection. It is recommended that the Traffic Commission receive and file this report.

BACKGROUND:

Barbera is a 40-foot wide, two lane residential collector roadway. It is named as the west and south legs of the intersection with Marsala. On-street parking is allowed on both sides of the roadway, except along the east side of Barbera from Marsala to 160-feet southerly. There is a Stop sign with pavement markings on the eastbound Barbera approach to the intersection with Marsala. San Joaquin Elementary School is located on the southwesterly corner of the intersection. Speed limit is posted at 25 mph.

Marsala is a 40-foot wide north-south residential roadway. It is a two-lane roadway with on-street parking allowed on both sides of the roadway. Marsala has a southerly terminus at the intersection with Barbera. There is no posting, and none is required, of the "Prima facie" speed limit of 25 mph. Please see attached Vicinity Map.

City Staff received a request to install an all-way stop control at the intersection of Barbera at Marsala. The reason behind the request was to change the traffic control for pedestrian crossing during school drop-off and pick-up hours. In accordance with the Residential Streets Management Policy and the California Manual on Uniform Traffic Control Devices (CaMUTCD), the City's Traffic Engineering Consulting firm, Hartzog & Crabill, Inc. (HCI), performed a multi-way stop warrant analysis at the subject intersection. The accident history, traffic speeds, traffic volumes, and visibility at the intersection were all reviewed. In summary, an all-way stop control is not warranted based on collected data; please see attached report for details. A similar all-way stop control review was performed in 1996 which revealed similar results.

As discussed in the attached report, there are no pedestrian related collisions at this intersection during the most recent 5-year period. Moreover, the subject intersection is similar in nature to other intersections in the City. The City will be performing a traffic

count to verify if there is a need for a crossing guard at this intersection. Crossing Guards are administered through the Sheriff's department. There is a crossing guard at the intersection of Santa Vittoria at Barbera, which is approximately 300 feet west of the subject intersection, please see attached Vicinity Map. It is recommended that the Traffic Commission receive and file this report.

RECOMMENDATION: THAT THE TRAFFIC COMMISSION RECEIVE AND FILE THIS REPORT

ATTACHMENTS:

- Vicinity Map
- Hartzog & Crabill, Inc. Report dated February 10, 2014



Trammell Hartzog, President
Jerry Crabill, P.E. (Retired)
Gerald J. Stock, P.E., Executive
Vice-President

17852 E. 17th Street
Suite 101
Tustin, CA 92780

Phone: (714) 731-9455
FAX: (714) 731-9498

www.hartzog-crabill.com

February 10, 2014

Mr. Kenneth H. Rosenfield, P.E.
Director of Public Services
City of Laguna Hills
24035 El Toro Road
Laguna Hills, CA 92653

**Subject: Multi-way Stop Sign Analysis:
Intersection of Barbera at Marsala**

Dear Mr. Rosenfield:

Hartzog & Crabill, Inc. (HCI) has completed a Multi-Way Stop Sign Warrant Analysis for the subject intersection. As you will see in the attached report, no warrants were satisfied, and our recommendation is for denial of a three-way stop sign installation at this intersection.

The analysis was completed in response to the City's request to verify if a multi-way stop sign installation is warranted, and recommended based on meeting standard guidelines. The California Manual of Uniform Traffic Control Devices (*California MUTCD*) was used for defining the requirements for a multi-way stop sign installation. At the present time, the intersection has one STOP regulatory sign control on the eastbound Barbera approach to the intersection. Parking restrictions of at least one car length on both sides of each corner of the intersection are recommended in order to assure that minimum sight distance is maintained.

It has been our pleasure to prepare this analysis for the City of Laguna Hills. If you have any questions or need more information please call (714) 731-9455.

Very truly yours,
HARTZOG & CRABILL, INC.

A handwritten signature in blue ink, appearing to read 'Gerald J. Stock', is written over a blue horizontal line.

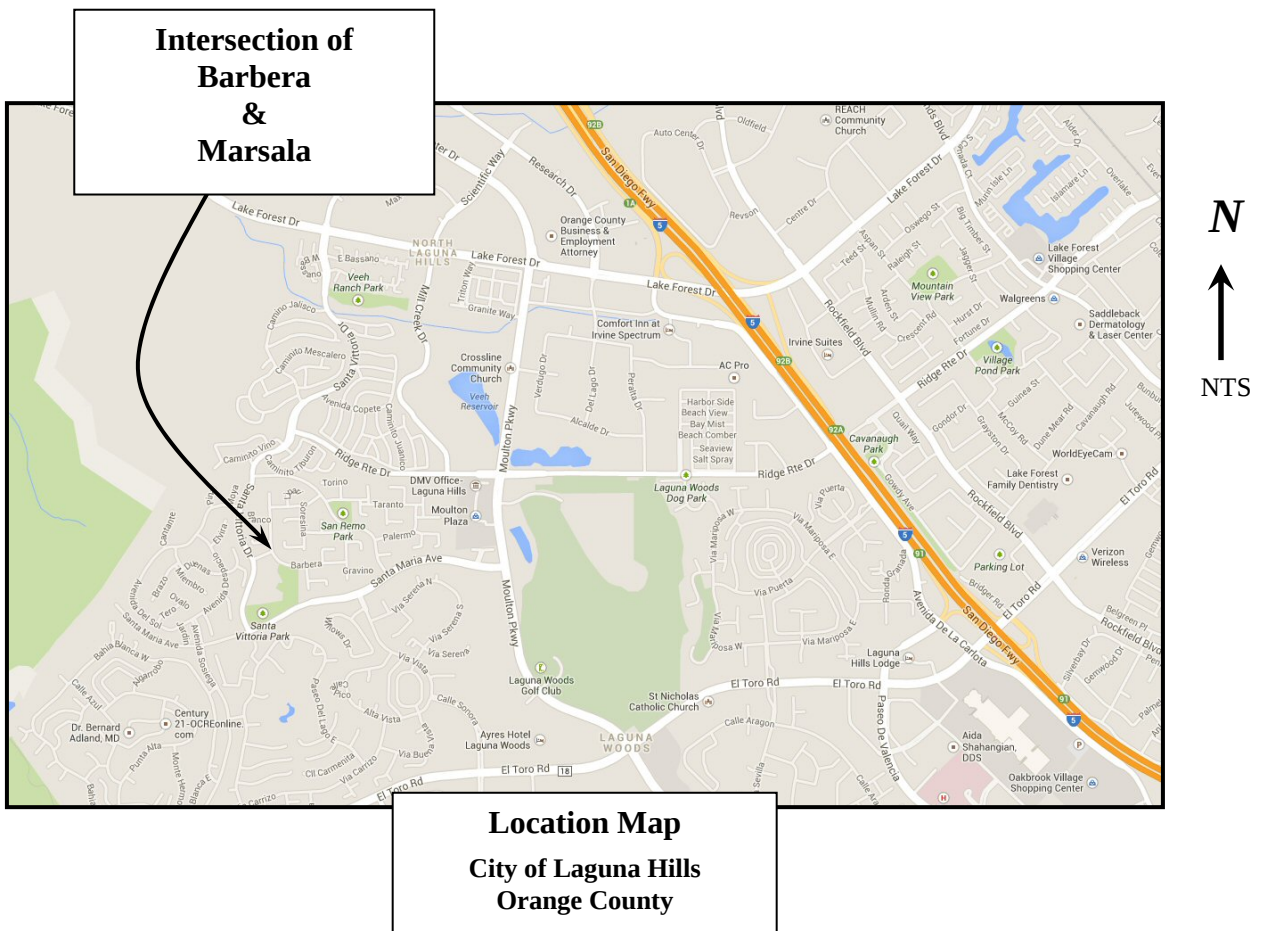
Gerald J. Stock, P.E.
Vice President
City & Traffic Engineering Services

Attach: Multi-way Stop Control Warrants Analysis Report

MULTI-WAY STOP CONTROL WARRANTS ANALYSIS BARBERA AT MARSALA IN THE CITY OF LAGUNA HILLS, CA

INTRODUCTION

The City of Laguna Hills requested Hartzog & Crabill, Inc. (HCI) to complete a Multi-way Stop Warrants Analysis at the intersection of Barbera and Marsala. This analysis was completed in order to verify if a multi-way stop sign installation is warranted and recommended based on meeting standard guidelines. The location is a T-intersection with Barbera running in the eastbound and northbound directions to the intersection and Marsala running in the southbound direction. The intersection is located west of the Interstate 5 Freeway, just east of Santa Vittoria Drive (*see Location Map below*). The intersection is entirely within the City of Laguna Hills' jurisdiction. Presently, there is one STOP sign posted for the eastbound Barbera approach to this intersection.



BACKGROUND

Barbera is a 40-foot wide local residential collector roadway with primarily residential frontage on both sides of the street. It must be noted, Barbera is named as the west and south legs of the intersection with Marsala (which is the north leg). The two-lane roadway provides for one lane of traffic in each direction, which are separated by a single, yellow, centerline stripe at the intersection. There are marked yellow crosswalks across the west and south legs of Barbera. The roadway is fully-improved with concrete curb and gutter, and sidewalk on both sides. Barbera has a posted speed limit on the eastbound approach of 25 miles per hour (MPH) When Children Are Present. San Joaquin Elementary School is located on the southwesterly corner of the intersection. On-street parking is allowed on both sides of the roadway, with exception to a 160-foot signed parking restriction on the east side of Barbera, just south of Marsala. There is a STOP sign with STOP limit line and pavement marking controlling traffic on the eastbound Barbera approach to the intersection with Marsala (northbound Barbera approach is not STOP controlled).

See Exhibit 1 (next page) for photo images of Barbera.

Marsala is a 40-foot wide, north-south local cul-de-sac roadway with residential frontage on both sides. Marsala has a southerly terminus at the intersection with Barbera and a northerly terminus just north of the nearby intersection with Teramo. The two-lane roadway provides for one lane of traffic in each direction, which are separated by a single, yellow, centerline stripe at the intersection with Barbera. The roadway is fully-improved with concrete curb, gutter, and sidewalk on both sides. Marsala does not have a posted speed limit; however, the residential nature of this street results in a '*prima facie*' speed limit of 25 MPH and does not require posting. On-street parking is allowed on both sides of the roadway. There is no regulatory signage controlling traffic on Marsala (uncontrolled) at its intersection with Barbera.

See Exhibit 2 (following page) for a photo image of Marsala.

EXHIBIT 1



BARBERA (LOOKING EASTBOUND) @ MARSALA (N) / BARBERA (S)



BARBERA (LOOKING NORTHBOUND) @ MARSALA (N) / BARBERA (W)

EXHIBIT 2



WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Laguna Hills follows State guidelines for determining if traffic control devices, such as multi-way stop signs, should be installed. Therefore, the prevailing source used for this analysis is the State of California Manual of Uniform Traffic Control Devices (*California MUTCD*). The California MUTCD contains minimum guidelines regarding traffic volumes, collisions, speeds, visibility, and other criteria in order to satisfy the requirements, in this case, for the recommendation and installation of a multi-way stop.

The California MUTCD Multi-way Stop Applications Guidance criteria are described in the following four main parts:

- 1) As an interim measure where traffic control signals are justified;
- 2) Reported crashes – five or more in a 12-month period that are susceptible to correction by a multi-way stop installation;
- 3) Minimum traffic and pedestrian volumes, speeds, and delay; and,
- 4) Where a combination of the above criteria are all satisfied to 80 percent.

If any one, or a combination, of these criteria is met, then a multi-way stop application should be considered. If these criteria are not met, the installation of an unwarranted multi-way stop sign installation is typically not recommended as it may place the City in a position of potential liability.

The California MUTCD guidelines describing Right-of-Way at Intersections, STOP Sign Applications, Multi-way Stop Applications, and Yield Sign Applications are included in Appendix A.

MULTI-WAY STOP ANALYSIS

The California MUTCD Multi-way Stop Applications section contains guidelines, such as minimum collisions and traffic volumes necessary for the justification of multi-way stop control. The general guidelines given for a stop sign application begin with using engineering judgment for the installation of a stop sign(s) on a street entering a through highway and where high speeds on the cross street make entry difficult, or due to restricted view, or when crash records indicate a need for control by a stop sign. Further guidance criteria found in the California MUTCD include the following important statements: ***“YIELD or STOP signs should not be used for speed control... In most cases, the street carrying the lowest volume of traffic should be controlled... A STOP (R1-1) sign is not a ‘cure-all’ and is not a substitute for other traffic control devices. Often, the need for a STOP (R1-1) sign can be eliminated if the sight distance is increased by removing obstructions... A YIELD or STOP sign should not be installed on the higher volume roadway unless justified by an engineering study... Multi-way stop control is used where the volume of traffic on the intersecting roads is approximately equal...”***

Collision History

The guidelines for Multi-way Stop Applications contained in the California MUTCD regarding collisions, or crashes, require a minimum of five (5) reported crashes occurring in a 12-month period that are susceptible to correction by a multi-way stop installation in order to satisfy this warrant. Such crashes include right- and left-turn collisions, as well as right-angle collisions (i.e., broadside, or head-on) and pedestrian-vehicle collisions. The latest available collision history for the intersection was gathered from the State of California Highway Patrol (CHP) Statewide Integrated Traffic Records System (SWITRS). A comprehensive 5-year traffic collision history summary report was prepared for this intersection and reviewed for collisions susceptible to correction by the installation of a multi-way stop. Table 1 (*next page*) provides the most recent summary of collision history occurring at or near this intersection.

Collision History (continued)

**TABLE 1
SWITRS COLLISION SUMMARY**

Intersection	2008-09		2010		2011		2012	
	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?
Barbera at Marsala	02/12/09	Hit Object / No (Away from Inters.)	10/07	Rear-End / No (Away from Inters.)		None Reported		None Reported

Notes: Information above is derived per the latest 5-year intersection traffic collision database report provided by CHP SWITRS.

- 1) Type of Coll. = Type of Collision (*i.e., broadside, rear-end, etc.*)
- 2) Correctible? = Yes / No

As shown, there have been (2) reported collisions at or near the intersection during the past (5) years of available SWITRS collision data. Both of the collisions occurred away from the intersection, and were not of the correctible type. Since the collision warrant requires a minimum of (5) reported crashes, susceptible to correction by a multi-way stop, to occur within a 12-month period, the collision warrant is not satisfied.

All traffic collision data collected for this intersection is included in Appendix B.

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Thursday, January 23, 2014 in order to account for vehicles that typically use this intersection. The 24-hour traffic count for the eastbound Barbera approach is 653 vehicles with the highest AM peak-hour volume of 174 vehicles and the highest PM peak-hour volume of 62 vehicles. The 24-hour traffic count for the northbound Barbera approach is 445 vehicles with the highest AM peak-hour volume of 82 vehicles and the highest PM peak-hour volume of 58 vehicles. The 24-hour traffic count for the southbound Marsala approach is 222 vehicles per day with the highest AM peak-hour volume of 47 vehicles and the highest PM peak-hour volume of 17 vehicles. Table 2 below provides a breakdown of the approach volumes.

Traffic Volumes (continued)

**TABLE 2
VEHICULAR ADT COUNT DATA**

Street	Direction	24-Hour Volume	Directional Split	Highest Hourly Volume
Barbera	Eastbound	653	60%	174 (7:00–8:00AM)
	Northbound	445	40%	82 (7:00–8:00AM)
Marsala				
	Southbound	222	100%	47 (7:00–8:00AM)

The southbound Marsala and northbound Barbera approaches may be considered the ‘through’ or ‘major’ street due to the intersection geometry and having slightly higher volumes at the ‘top’ of this T-intersection. Moreover, the eastbound Barbera approach may be considered the ‘minor’ street since most likely eastbound Barbera traffic does have to stop at the intersection before proceeding left on Marsala or right on Barbera, it is already STOP controlled, and has its westerly terminus at Santa Vittoria Drive.

It is typically expected that the traffic volumes on the minor street are considerably less than those on the major street. Yet, this intersection is particularly interesting, and not typical, since Barbera has the same name on two intersecting approaches. As can be seen from the table above, the minor approach (eastbound Barbera) carries approximately 50% of the entire traffic entering the intersection. This is most likely due to the geometric layout of the streets and how traffic circulates toward the adjacent elementary school.

A part of the California MUTCD guideline criteria also calls for a reduction in the required minimum volumes when the critical approach speed (*or 85th-percentile speed*) on the major street exceeds 40 MPH. If this is the case, the minimum vehicular volumes to be met for a multiway stop installation are reduced to 70%. As both roadways have a posted or un-posted ‘*prima facie*’ residential speed limit of 25 MPH, the 70% minimum volumes for a multi-way stop sign analysis are not applicable.

Traffic Volumes (continued)

It is important to note that the hourly vehicle traffic counts shown in Table 2 above are given for the highest hour of traffic for each direction, and serve as a good indicator to compare with the required minimum hourly traffic volumes in the California MUTCD multi-way stop guidelines. It should also be mentioned that the average hourly minimum volumes for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just one hour).

Table 3 below shows the California MUTCD minimum traffic volume guidelines for a Multi-way Stop Application in comparison with the highest 8-hour traffic count data at this intersection. Both Parts 1 and 2 of the minimum volume warrants below must be satisfied in order to fulfill the traffic volume warrant.

TABLE 3

**MULTIWAY STOP SIGN WARRANT FOR MINIMUM TRAFFIC VOLUMES
BARBERA AT MARSALA**

Part 1. The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any (8) hours of an average day, <u>Results:</u> No, average (59) vehicles per hour Meets only 20% of required average major street hourly traffic volumes	<i>and</i>	Part 2. The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same (8) hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour, <u>Results:</u> No, average (63) vehicles per hour Meets only 32% of required minor street hourly traffic volumes	<i>but</i>	Part 3. If the 85th -percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are (70) percent of the above values. <u>Results:</u> No < 40 MPH Posted 25 MPH
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As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy the required volumes in both Parts 1 and 2 (*20% major street / 32% minor street*). Consequently, the traffic volume warrant is not satisfied for a multi-way stop sign installation. Again, it is important to note that the current stop-controlled ‘minor’ approach of eastbound Barbera does have a higher-than-expected traffic volume that is approximately equal to the intersecting roads’ traffic volumes. ***All traffic volume data collected for this intersection is included in Appendix C.***

Speeds

Both Barbera and Marsala have a posted or unposted *prima facie* speed limit of 25 MPH, which is expected for two-lane local residential collector roadways. Field observations confirmed that vehicles were not regularly speeding over these speeds near the intersection, but were typical for an urbanized two-lane local roadway environment.

Visibility

Impaired visibility, or restricted sight distance, due to the geometry of the intersection was carefully considered during our field-review of the surrounding urban, residential/school environment. The geometry of the intersection does have slight horizontal and vertical curvature on the south leg; however, it was determined in the field that special traffic signage for improved visibility of the intersection, or other advanced signage, is not necessary for this residential, low speed street.

Driver sight distance was measured from the stopped location of eastbound Barbera since this is the approach that intersects with the top of the T-intersection. The measured distance was derived from the stopping sight distance guidelines found in the California MUTCD (*see Appendix D*). In this reference, a 25 MPH roadway speed recommends a minimum Stopping Sight Distance of 155 feet, while 30 MPH (5 MPH higher than posted) recommends 200 feet. A 200 foot minimum sight distance was used for our evaluation. More specifically, this stopping sight distance was field-measured from a typical ‘stopped’ vehicle location on eastbound Barbera towards the oncoming lanes of traffic on southbound Marsala and northbound Barbera. An orange cone was set at this distance, and a photograph was taken from a stopped driver’s perspective. As Exhibit 3 on the next page shows, sight distance when looking from eastbound Barbera did have a clear line of sight to the cone. Consequently, the minimum stopping visibility is considered satisfied from the side street of this T-intersection. It should be mentioned that on-street parked vehicles may occasionally hinder this sight distance if they are higher profile or parked very close to the corners. Parking restrictions of at least one car length are advisable. (*See sight distance photos in Exhibit 3 on the following page*).

EXHIBIT 3



EB BARBERA (LOOKING NORTHERLY) @ MARSALA



EB BARBERA (LOOKING SOUTHERLY) @ BARBERA

MULTIWAY STOP ANALYSIS SUMMARY

The analysis of the four (4) main criteria provided in the California MUTCD regarding Multi-way Stop Applications showed that this intersection did not meet the minimum guidelines to justify stopping the major roadway (northbound Barbera/southbound Marsala). The four main criteria analyzed were: 1) As an interim measure where traffic control signals are justified; 2) Reported collisions – a correctible crash problem; 3) Traffic and pedestrian volumes, speeds, and delay; and 4) Where a combination of the above criteria are satisfied to 80 percent.

In summary, the collision history at the intersection resulted in (2) SWITRS-reported (non-correctible) collisions during the last (5) years of available data, where the minimum guideline calls for at least five (5) correctible collisions in a 12-month period.

The average minimum hourly traffic volumes for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were not close to being satisfied. Excessive delay to the minor roadway (eastbound Barbera) was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes do not satisfy the minimum guidelines, it can also be derived that a traffic signal is not justified at this intersection. The 80% combined criteria were also not met as both the collision history and minimum traffic volumes guidelines were not satisfied to this percentage.

Engineering judgment should always be included in any decision regarding traffic safety improvements. Intersection lighting was verified and found to be adequate as there was typical local roadway lighting (70 W) on one street light located on the southwest corner. Further intersection information was gathered in the field in regards to pedestrian and bicycle activity which was determined as moderate-to-high activity due to the adjacent elementary school.

MULTIWAY STOP ANALYSIS SUMMARY (continued)

In terms of visibility and roadway curvature, it was determined in the field that this intersection does not require further consideration for any special signage, since the minimum sight distance was satisfied. Although minimum sight distance was field-measured and found satisfied from the side-street perspective, parking restrictions of at least one car length are advisable in order to assure sight distance is maintained.

It is important to note that the current stop-controlled approach of eastbound Barbera does have a higher-than-expected traffic volume for a 'minor' street that is approximately equal to the intersecting roads' traffic volumes. This is most likely due to the geometric layout of the streets and how traffic circulates toward the adjacent elementary school, and is one factor for the consideration of a multi-way stop control application. However, at this time higher speeds, restricted view, and crash records are factors that are not present for further consideration of multi-way stop control at this intersection.

CONCLUSION / RECOMMENDATION

In overall consideration of the existing conditions at the intersection of Barbera and Marsala, and no warrants found satisfied, a multi-way stop sign installation is not recommended at this time. Parking restrictions of at least one car length on both sides of each corner of the intersection are advisable in order to assure that minimum sight distance is maintained.

APPENDIX A

**MULTIWAY STOP APPLICATIONS
GUIDELINES:**

CALIFORNIA MUTCD

Standard:

03 Except as provided in Paragraphs 4 and 5, the minimum sizes for regulatory signs facing traffic on multi-lane conventional roads shall be as shown in the Multi-lane column of Table 2B-1 and 2B-1(CA).

Option:

04 Where the posted speed limit is 35 mph or less on a multi-lane highway or street, other than for a STOP sign, the minimum size shown in the Single Lane column in Table 2B-1 and 2B-1(CA) may be used.

05 Where a regulatory sign, other than a STOP sign, is placed on the left-hand side of a multi-lane roadway in addition to the installation of the same regulatory sign on the right-hand side or the roadway, the size shown in the Single Lane column in Table 2B-1 and 2B-1(CA) may be used for both the sign on the right-hand side and the sign on the left-hand side of the roadway.

Standard:

06 A minimum size of 36 x 36 inches shall be used for STOP signs that face multi-lane approaches.

07 Where side roads intersect a multi-lane street or highway that has a speed limit of 45 mph or higher, the minimum size of the STOP signs facing the side road approaches, even if the side road only has one approach lane, shall be 36 x 36 inches.

08 Where side roads intersect a multi-lane street or highway that has a speed limit of 40 MPH or lower, the minimum size of the STOP signs facing the side road approaches shall be as shown in the Single Lane or Multi-lane columns of Table 2B-1 and 2B-1(CA) based on the number of approach lanes on the side street approach.

Guidance:

09 The minimum sizes for regulatory signs facing traffic on exit and entrance ramps should be as shown in the column of Table 2B-1 and 2B-1(CA) that corresponds to the mainline roadway classification (Expressway or Freeway). If a minimum size is not provided in the Freeway column, the minimum size in the Expressway column should be used. If a minimum size is not provided in the Freeway or Expressway Column, the size in the Oversized column should be used.

Section 2B.04 Right-of-Way at Intersections

Support:

01 State or local laws written in accordance with the "Uniform Vehicle Code" (see Section 1A.11) establish the right-of-way rule at intersections having no regulatory traffic control signs such that the driver of a vehicle approaching an intersection must yield the right-of-way to any vehicle or pedestrian already in the intersection. When two vehicles approach an intersection from different streets or highways at approximately the same time, the right-of-way rule requires the driver of the vehicle on the left to yield the right-of-way to the vehicle on the right. The right-of-way can be modified at through streets or highways by placing YIELD (R1-2) signs (see Sections 2B.08 and 2B.09) or STOP (R1-1) signs (see Sections 2B.05 through 2B.07) on one or more approaches.

Guidance:

02 Engineering judgment should be used to establish intersection control. The following factors should be considered:

- A. Vehicular, bicycle, and pedestrian traffic volumes on all approaches;**
- B. Number and angle of approaches;**
- C. Approach speeds;**
- D. Sight distance available on each approach; and**
- E. Reported crash experience.**

03 YIELD or STOP signs should be used at an intersection if one or more of the following conditions exist:

- A. An intersection of a less important road with a main road where application of the normal right-of-way rule would not be expected to provide reasonable compliance with the law;**
- B. A street entering a designated through highway or street; and/or**
- C. An unsignalized intersection in a signalized area.**

04 In addition, the use of YIELD or STOP signs should be considered at the intersection of two minor streets or local roads where the intersection has more than three approaches and where one or more of the following conditions exist:

- A. The combined vehicular, bicycle, and pedestrian volume entering the intersection from all approaches averages more than 2,000 units per day;*
- B. The ability to see conflicting traffic on an approach is not sufficient to allow a road user to stop or yield in compliance with the normal right-of-way rule if such stopping or yielding is necessary; and/or*
- C. Crash records indicate that five or more crashes that involve the failure to yield the right-of-way at the intersection under the normal right-of-way rule have been reported within a 3-year period, or that three or more such crashes have been reported within a 2-year period.*

05 YIELD or STOP signs should not be used for speed control.

Support:

06 Section 2B.07 contains provisions regarding the application of multi-way STOP control at an intersection.

Guidance:

07 Once the decision has been made to control an intersection, the decision regarding the appropriate roadway to control should be based on engineering judgment. In most cases, the roadway carrying the lowest volume of traffic should be controlled.

08 A YIELD or STOP sign should not be installed on the higher volume roadway unless justified by an engineering study.

Support:

09 The following are considerations that might influence the decision regarding the appropriate roadway upon which to install a YIELD or STOP sign where two roadways with relatively equal volumes and/or characteristics intersect:

- A. Controlling the direction that conflicts the most with established pedestrian crossing activity or school walking routes;*
- B. Controlling the direction that has obscured vision, dips, or bumps that already require drivers to use lower operating speeds; and*
- C. Controlling the direction that has the best sight distance from a controlled position to observe conflicting traffic.*

Standard:

10 Because the potential for conflicting commands could create driver confusion, YIELD or STOP signs shall not be used in conjunction with any traffic control signal operation, except in the following cases:

- A. If the signal indication for an approach is a flashing red at all times;**
- B. If a minor street or driveway is located within or adjacent to the area controlled by the traffic control signal, but does not require separate traffic signal control because an extremely low potential for conflict exists; or**
- C. If a channelized turn lane is separated from the adjacent travel lanes by an island and the channelized turn lane is not controlled by a traffic control signal.**

10a STOP signs shall not be erected at any entrance to an intersection controlled by traffic signals. Refer to CVC 21355(a).

11 Except as provided in Section 2B.09, STOP signs and YIELD signs shall not be installed on different approaches to the same unsignalized intersection if those approaches conflict with or oppose each other.

12 Portable or part-time STOP or YIELD signs shall not be used except for emergency and temporary traffic control zone purposes.

13 A portable or part-time (folding) STOP sign that is manually placed into view and manually removed from view shall not be used during a power outage to control a signalized approach unless the maintaining agency establishes that the signal indication that will first be displayed to that approach upon restoration of power is a flashing red signal indication and that the portable STOP sign will be manually removed from view prior to stop-and-go operation of the traffic control signal.

Option:

14 A portable or part-time (folding) STOP sign that is electrically or mechanically operated such that it only displays the STOP message during a power outage and ceases to display the STOP message upon restoration of power may be used during a power outage to control a signalized approach.

Support:

¹⁵ Section 9B.03 contains provisions regarding the assignment of priority at a shared-use path/ roadway intersection.

Section 2B.05 STOP Sign (R1-1) and ALL WAY Plaque (R1-3P)

Standard:

⁰¹ When it is determined that a full stop is always required on an approach to an intersection, a STOP (R1-1) sign (see Figure 2B-1) shall be used.

⁰² The STOP sign shall be an octagon with a white legend and border on a red background.

⁰³ Secondary legends shall not be used on STOP sign faces.

⁰⁴ At intersections where all approaches are controlled by STOP signs (see Section 2B.07), an ALL WAY supplemental plaque (R1-3P) shall be mounted below each STOP sign. The ALL WAY plaque (see Figure 2B-1) shall have a white legend and border on a red background.

⁰⁵ The ALL WAY plaque shall only be used if all intersection approaches are controlled by STOP signs.

⁰⁶ Supplemental plaques with legends such as 2-WAY, 3-WAY, 4-WAY, or other numbers of ways shall not be used with STOP signs.

Support:

⁰⁷ The use of the CROSS TRAFFIC DOES NOT STOP (W4-4P) plaque (and other plaques with variations of this word message) is described in Section 2C.59.

Guidance:

⁰⁸ *Plaques with the appropriate alternative messages of TRAFFIC FROM LEFT (RIGHT) DOES NOT STOP (W4-4aP) or ONCOMING TRAFFIC DOES NOT STOP (W4-4bP) should be used at intersections where STOP signs control all but one approach to the intersection, unless the only non-stopped approach is from a one-way street.*

Option:

⁰⁹ An EXCEPT RIGHT TURN (R1-10P) plaque (see Figure 2B-1) may be mounted below the STOP sign if an engineering study determines that a special combination of geometry and traffic volumes is present that makes it possible for right-turning traffic on the approach to be permitted to enter the intersection without stopping.

Support:

¹⁰ The design and application of Stop Beacons are described in Section 4L.05.

¹¹ A STOP (R1-1) sign is not a "cure-all" and is not a substitute for other traffic control devices. Often, the need for a STOP (R1-1) sign can be eliminated if the sight distance is increased by removing obstructions.

Through Highways

Option:

¹² STOP (R1-1) signs may be installed either at or near the entrance to a State highway, except at signalized intersections, or at any location so as to control traffic within an intersection. Refer to CVC 21352 and 21355. See Section 1A.11 for information regarding this publication.

Support:

¹³ When STOP (R1-1) signs or traffic control signals have been erected at all entrances, a highway constitutes a through highway. Refer to CVC 600.

¹⁴ Authority to place STOP (R1-1) signs facing State highway traffic is delegated to the Department of Transportation's District Directors.

Option:

¹⁵ Local authorities may designate any highway under their jurisdiction as a through highway and install STOP (R1-1) signs in a like manner. Refer to CVC 21354.

Standard:

¹⁶ No local authority shall erect or maintain any STOP (R1-1) sign or other traffic control device requiring a stop, on any State highway, except by permission of the Department of Transportation. Refer to CVC 21353.

Support:

¹⁷ The Department of Transportation will grant such permission only when an investigation indicates that the STOP (R1-1) sign will benefit traffic.

Section 2B.06 STOP Sign Applications

Guidance:

- 01 At intersections where a full stop is not necessary at all times, consideration should first be given to using less restrictive measures such as YIELD signs (see Sections 2B.08 and 2B.09).*
- 02 The use of STOP signs on the minor-street approaches should be considered if engineering judgment indicates that a stop is always required because of one or more of the following conditions:*
 - A. The vehicular traffic volumes on the through street or highway exceed 6,000 vehicles per day;*
 - B. A restricted view exists that requires road users to stop in order to adequately observe conflicting traffic on the through street or highway; and/or*
 - C. Crash records indicate that three or more crashes that are susceptible to correction by the installation of a STOP sign have been reported within a 12-month period, or that five or more such crashes have been reported within a 2-year period. Such crashes include right-angle collisions involving road users on the minor-street approach failing to yield the right-of-way to traffic on the through street or highway.*

Support:

- 03 The use of STOP signs at grade crossings is described in Sections 8B.04 and 8B.05.*

Section 2B.07 Multi-Way Stop Applications

Support:

- 01 Multi-way stop control can be useful as a safety measure at intersections if certain traffic conditions exist. Safety concerns associated with multi-way stops include pedestrians, bicyclists, and all road users expecting other road users to stop. Multi-way stop control is used where the volume of traffic on the intersecting roads is approximately equal.*

- 02 The restrictions on the use of STOP signs described in Section 2B.04 also apply to multi-way stop applications.*

Guidance:

- 03 The decision to install multi-way stop control should be based on an engineering study.*
- 04 The following criteria should be considered in the engineering study for a multi-way STOP sign installation:*
 - A. Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.*
 - B. Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.*
 - C. Minimum volumes:*
 - 1. The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and*
 - 2. The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour; but*
 - 3. If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2.*
 - D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.*

Option:

- 05 Other criteria that may be considered in an engineering study include:*
 - A. The need to control left-turn conflicts;*
 - B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;*
 - C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop; and*
 - D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection.*

APPENDIX B

SWITRS COLLISION HISTORY

**CITY OF LAGUNA HILLS
INTERSECTION OF BARBERA AT MARSALA
SWITRS COLLISION DATABASE
JANUARY 1, 2008 TO DECEMBER 31, 2012**

CASE ID	COLLISION		PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTER.	WEATH. 1	COLL. SEVERITY	PRIM.	PCF	HIT	TYPE	MOTOR VEHICLE	ROAD SURF.
	DATE	TIME								COLL. FACT.	VIOL. CAT.	AND RUN	OF COLL.	INVOLVED WITH	
4924260	20101007	1415	BARBERA	SANTA VITTORIA DR	180	W	N	A	0	B	22	N	C	C	A
4144281	20090212	2143	MARSALA	BARBERA	80	S	N	A	0	A	8	N	E	I	A

NOTES:

Weather 1

A - Clear
B - Cloudy
C - Raining
D - Snowing
E - Fog
F - Other
G - Wind
- - Not Stated

Collision Severity

1 - Fatal
2 - Injury (Severe)
3 - Injury (Other Visible)
4 - Injury (Complaint of Pain)
0 - PDO (Property Damage Only)

Primary Collision Factor

A - (Vehicle) Code Violation
B - Other Improper Driving
C - Other Than Driver
D - Unknown
E - Fell Asleep
- - Not Stated

PCF Violation Category

01 - Driving or Bicycling Under Influence
02 - Impeding Traffic
03 - Unsafe Speed
04 - Following Too Closely
05 - Wrong Side of Road
06 - Improper Passing
07 - Unsafe Lane Change
08 - Improper Turning
09 - Automobile ROW
10 - Pedestrian ROW

Hit and Run

F - Felony
M - Misdemeanor
N - Not Hit & Run

Type of Collision

A - Head-On
B - Sideswipe
C - Rear-End
D - Broadside
E - Hit Object
F - Overturned
G - Vehicle/Pedestrian
H - Other
- - Not Stated

Motor Vehicle Involved With:

A - Non-Collision
B - Pedestrian
C - Other Motor Vehicle
D - Motor Vehicle on Other Roadway
E - Parked Motor Vehicle
F - Train
G - Bicycle
H - Animal
I - Fixed Object
J - Other Object
- - Not Stated

Road Surface

A - Dry
B - Wet
C - Snowy or Icy
D - Slippery
- - Not Stated

11 - Pedestrian Violation
12 - Traffic Signals and Signs
13 - Hazardous Parking
14 - Lights
15 - Brakes
16 - Other Equipment
17 - Other Hazardous Violation
18 - Other Than Driver (or Ped)
19 -
20 -
21 - Unsafe Starting or Backing
22 - Other Improper Driving
23 - Pedestrian or "Other" Under the Influence
24 - Fell Asleep
00 - Unknown
- - Not Stated

3/19/2014 ITEM NO. 6.1

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT) COUNT DATA

VOLUME

Marsala & Barbera

Day: Thursday
Date: 1/23/2014City: Laguna Hills
Project #: CA14_1009_001

DAILY TOTALS					NB	SB					EB	WB	Total
					445	222					653	0	1,320
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL		
00:00	0	0	0	0	0	12:00	6	0	9	0	15		
00:15	0	0	1	0	1	12:15	1	5	4	0	10		
00:30	0	0	0	0	0	12:30	1	1	5	0	7		
00:45	0	0	0	1	0	12:45	6	14	1	7	22	0	43
01:00	0	0	0	0	0	13:00	4	1	10	0	15		
01:15	0	0	1	0	1	13:15	16	1	13	0	30		
01:30	0	2	2	0	4	13:30	6	5	11	0	22		
01:45	0	0	2	3	0	13:45	17	43	10	17	28	62	122
02:00	0	0	0	0	0	14:00	31	10	19	0	60		
02:15	0	0	0	0	0	14:15	10	1	14	0	25		
02:30	0	0	0	0	0	14:30	6	3	12	0	21		
02:45	0	0	0	0	0	14:45	11	58	3	17	6	51	126
03:00	0	0	0	0	0	15:00	5	3	3	0	11		
03:15	0	0	0	0	0	15:15	7	5	13	0	25		
03:30	0	0	0	0	0	15:30	4	3	8	0	15		
03:45	0	0	0	0	0	15:45	3	19	4	15	14	38	72
04:00	0	0	0	0	0	16:00	7	2	13	0	22		
04:15	1	0	0	0	1	16:15	3	1	11	0	15		
04:30	2	0	0	0	2	16:30	7	5	6	0	18		
04:45	0	3	1	1	1	16:45	5	22	0	8	8	38	68
05:00	1	1	0	0	2	17:00	6	0	16	0	22		
05:15	2	1	0	0	3	17:15	6	2	6	0	14		
05:30	3	2	0	0	5	17:30	5	5	12	0	22		
05:45	3	9	0	4	3	17:45	8	25	1	8	12	46	79
06:00	0	2	0	0	2	18:00	3	4	8	0	15		
06:15	1	3	1	0	5	18:15	1	2	5	0	8		
06:30	2	4	4	0	10	18:30	2	2	8	0	12		
06:45	4	7	5	14	13	18:45	0	6	1	9	7	28	43
07:00	3	6	13	0	22	19:00	8	3	5	0	16		
07:15	11	7	18	0	36	19:15	1	0	6	0	7		
07:30	25	10	49	0	84	19:30	2	1	3	0	6		
07:45	43	82	24	47	94	19:45	1	12	3	7	2	16	35
08:00	35	13	32	0	80	20:00	4	0	4	0	8		
08:15	3	3	7	0	13	20:15	2	0	2	0	4		
08:30	7	5	11	0	23	20:30	2	0	1	0	3		
08:45	4	49	1	22	12	20:45	2	10	2	2	3	10	22
09:00	3	1	2	0	6	21:00	3	3	2	0	8		
09:15	6	3	2	0	11	21:15	0	0	2	0	2		
09:30	5	4	4	0	13	21:30	2	0	1	0	3		
09:45	12	26	6	14	14	21:45	1	6	0	3	4	9	18
10:00	10	5	9	0	24	22:00	1	1	2	0	4		
10:15	2	2	0	0	4	22:15	1	3	0	0	4		
10:30	4	1	3	0	8	22:30	4	0	1	0	5		
10:45	5	21	3	11	7	22:45	1	7	0	4	1	4	15
11:00	8	0	7	0	15	23:00	0	0	2	0	2		
11:15	8	3	17	0	28	23:15	0	2	2	0	4		
11:30	4	2	3	0	9	23:30	0	0	1	0	1		
11:45	6	26	3	8	6	23:45	0	0	2	1	6	0	8
TOTALS	223	123	323		669	TOTALS	222	99	330		651		
SPLIT %	33.3%	18.4%	48.3%		50.7%	SPLIT %	34.1%	15.2%	50.7%		49.3%		

DAILY TOTALS					NB	SB					EB	WB	Total
					445	222					653	0	1,320
AM Peak Hour	07:15	07:15	07:15	07:15	361	PM Peak Hour	13:15	13:15	13:45	13:15	167		
AM Pk Volume	114	54	193	0.561	PM Pk Volume	70	26	73	0.696	PM Pk Volume	70	26	73
Pk Hr Factor	0.663	0.563	0.513	0.561	Pk Hr Factor	0.565	0.650	0.652	0.696	Pk Hr Factor	0.565	0.650	0.652
7 - 9 Volume	131	69	236	0	436	4 - 6 Volume	47	16	84	0	147		
7 - 9 Peak Hour	07:15	07:15	07:15	07:15	361	4 - 6 Peak Hour	17:00	16:00	17:00	0	17:00		
7 - 9 Pk Volume	114	54	193	0	361	4 - 6 Pk Volume	25	8	46	0	79		
Pk Hr Factor	0.663	0.563	0.513	0.561	0.561	Pk Hr Factor	0.781	0.400	0.719	0.000	0.898		

APPENDIX D

STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED

CALIFORNIA MUTCD

Table 6C-1. Recommended Advance Warning Sign ~~Minimum~~ Spacing

Road Type	Distance Between Signs*		
	A	B	C
Urban (low speed) - 25 mph or less	100 feet	100 feet	100 feet
Urban (high speed) - more than 25 mph to 40 mph	250 feet	250 feet	250 feet
Urban (high speed) - more than 40 mph	350 feet	350 feet	350 feet
Rural	500 feet	500 feet	500 feet
Expressway / Freeway	1,000 feet	1,500 feet	2,640 feet

* ~~Speed category to be determined by the highway agency.~~

** The column headings A, B, and C are the dimensions shown in Figures 6H-1 through 6H-46. The A dimension is the distance from the transition or point of restriction to the first sign. The B dimension is the distance between the first and second signs. The C dimension is the distance between the second and third signs. (The "first sign" is the sign in a three-sign series that is closest to the TTC zone. The "third sign" is the sign that is furthest upstream from the TTC zone.)

Table 6C-2. Stopping Sight Distance as a Function of Speed

Speed*	Distance
20 mph	115 feet
25 mph	155 feet
30 mph	200 feet
35 mph	250 feet
40 mph	305 feet
45 mph	360 feet
50 mph	425 feet
55 mph	495 feet
60 mph	570 feet
65 mph	645 feet
70 mph	730 feet
75 mph	820 feet

* Posted speed, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed.

Can also be used as Stopping Sight Distance as suggested buffer space length or location for flagger station.

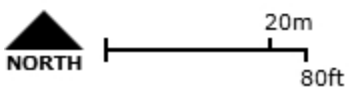
Table 6C-3. Taper Length Criteria for Temporary Traffic Control Zones

Type of Taper	Taper Length
Merging Taper	at least L
Shifting Taper	at least 0.5 L
Shoulder Taper	at least 0.33 L
One-Lane, Two-Way Traffic Taper	50 feet minimum, 100 feet maximum
Downstream Taper	50 feet minimum, 100 feet maximum

Note: Use Table 6C-4 to calculate L



San Joaquin
Elementary
School



Date: 02/21/14

VICINITY MAP



3/19/2014 ITEM NO. 6.1

CITY OF LAGUNA HILLS

March 2014

RADAR TRAILER SCHEDULE

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4 Glen Canyon W/B Mid-Block 25 MPH	5 Stageline W/O Hidden Trail 25 MOH	6 Bridlewood S/O Laurel Crest 25 MPH	7	8
9	10	11	12	13	14	15
16	17	18 Nellie Gail N/O Empty Saddle 25 MPH	19 Mustang W/O Farrier 25 MPH	20 Woodbluff W/B Mid block 25 MPH	21	22
23	24	25	26	27	28	29
30	31					

3/19/2014 ITEM NO. 7.4

CITY OF LAGUNA HILLS

APRIL 2014

RADAR TRAILER SCHEDULE

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8 Nellie Gail S/O Rockinghorse 25 MPH	9 Lost Colt E/O Beargrass 25 MPH	10 Rapid Falls W/O Sundowner 25 MPH	11	12
13	14	15	16	17	18	19
20	21	22 Nellie Gail S/O Rockinghorse 25 MPH	23 Mustang W/O Farrier 25 MPH	24 Glen Canyon S/B Mid-Block 25 MPH	25	26
27	28	29	30			