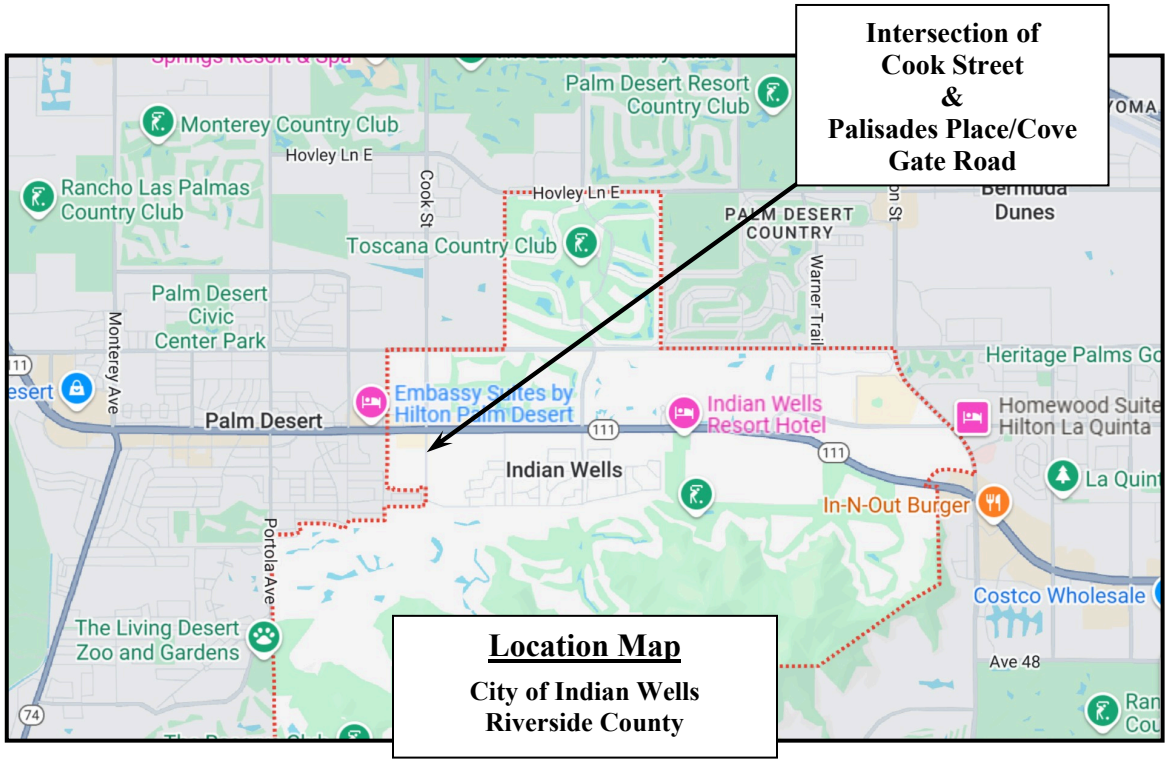
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF COOK STREET AND PALISADES PLACE/COVE GATE ROAD IN THE CITY OF INDIAN WELLS, CA MARCH 5, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Cook Street and Palisades Place/Cove Gate Road. This analysis was completed in order to verify if a four-way stop sign installation is warranted and recommended based on meeting standard guidelines.

The location is a 4-way intersection with Cook Street running in the north-south directions and Palisades Place/Cove Gate Road in the east-west directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a two-way STOP sign control installed on Palisades Place/Cove Gate Road.



BACKGROUND

At the subject intersection, **Cook Street** is classified as a north-south major collector roadway with primarily private gated, single-family residential properties on both sides of the street. The roadway is approximately 76 feet wide curb-to-curb. The 4-lane roadway provides for two lanes of traffic, a left-turn lane, and a bicycle lane in each direction that are separated by a raised, concrete, landscaped center median. The roadway transitions to a 3-lane roadway (two northbound & one southbound) south of the intersection with Palisades Place/Cove Gate Road. There are no marked crosswalks across Cook Street at or near the intersection. The roadway has curb and gutter improvements on both sides of the street. Cook Street has a posted speed limit of 35 MPH, and on-street parking is prohibited on both sides of the street via No Parking Any Time signs. Currently, there are no STOP signs or other types of traffic control on Cook Street (i.e., uncontrolled) at its intersection with Palisades Place/Cove Gate Road.

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

Palisades Place/Cove Gate Road is classified as an east-west private, gated local roadway leading to single-family residential properties on both sides of the street. The private roadways are comprised of brick pavers, and measure approximately 44 feet wide west of Cook Street and 70 feet wide east of Cook Street, divided by a raised center landscaped median. The 2-lane roadway provides for one lane of traffic in each direction. There are no marked crosswalks across Palisades Place/Cove Gate Road. The roadway has curb and gutter improvements on both sides of the street. Palisades Place/Cove Gate Road has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there are two-way STOP signs posted on Palisades Place/Cove Gate Road at its intersection with Cook Street.

See Exhibit 2 (following page) for photo images of Palisades Place/Cove Gate Road.

EXHIBIT 1



COOK STREET (*Looking Northbound*) at PALISADES PLACE/COVE GATE ROAD



COOK STREET (*Looking Southbound*) at PALISADES PLACE/COVE GATE ROAD

EXHIBIT 2



COVE GATE ROAD (*Looking Eastbound*) at COOK STREET



PALISADES PLACE (*Looking Westbound*) at COOK STREET

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 4-way (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.

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.

MULTIWAY 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. Such crashes include right-turn and left-turn collisions, as well as right-angle collisions (i.e., broadside, or head-on) and pedestrian-vehicle collisions. Other types categorized as 'sideswipe', 'rear-end', and 'hit object' collisions are generally not considered susceptible to correction, unless further review indicates otherwise. The latest available collision history was gathered by HCI from the California Highway Patrol (CHP) Statewide Integrated Traffic Records System website (*i-SWITRS*), which is where local jurisdictions such as cities report their collisions.

Collision History (continued)

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 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?
Cook St at Palisades/Cove		*None reported*		*None reported*		*None reported*		*None reported*

Notes: Information above is derived per the latest 5-year intersection collision database report gathered from CHP-SWITRS (*i-SWITRS website*).

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

As shown, there have been zero (0) reported collisions at or near this intersection over the past (5) years of available SWITRS collision data. 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. ***The prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, March 11, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Cook Street is 5,750 vehicles per day with the highest AM peak-hour volume having 455 vehicles, and 546 vehicles in the PM peak-hour. The bi-directional ADT count for Palisades Place/Cove Gate Road is 453 vehicles with the highest AM peak-hour volume having 56 vehicles, and 45 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The traffic volume data collected for this intersection is included in Appendix C.***

Traffic Volumes (continued)

TABLE 2
HIGHEST 24-HOUR INTERSECTION APPROACH VEHICLE COUNTS

Street	Direction	ADT Volume	Directional Split	Highest Hourly Volume
Cook Street	Northbound	2,547	44%	256 (2 - 3 PM)
	Southbound	3,203	56%	290 (2 - 3 PM)
Cove Gate Road / Palisades Place	Eastbound	229	51%	32 (10 - 11 AM)
	Westbound	224	49%	26 (9 - 10 AM)

Cook Street is considered the 'through' or 'major' street at this intersection since it carries higher volumes from both approaches, and drivers are not required to slow down, or even stop, before proceeding straight through the intersection. In comparison, Palisades Place/Cove Gate Road is considered the 'minor' street as drivers on these streets are required to stop at Cook Street and look both ways before proceeding to make a left-turn, right-turn, or go straight. It is typically expected that the traffic volumes on the minor street are significantly less than those on the major street. As can be seen from the table above, this is the case, as the minor street carries approximately 7% of the entire vehicular traffic entering the intersection (Cook Street carries 93% of entering traffic).

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 sign installation are reduced to 70%. As mentioned, the posted speed limit on Cook Street is 35 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at/below this posted speed near the intersection, and were considered typical of what may be expected for a four-lane collector type roadway. As the speed limit is less than the 40+ MPH limit required to reduce traffic volumes, the 70% minimum volumes for a multi-way stop sign analysis are <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the hourly vehicle traffic counts shown in Table 2 above are given for the highest one 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 must also be mentioned that the average hourly minimum volumes required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for 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 collected 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
COOK STREET AT PALISADES PLACE/COVE GATE RD

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,	***and***	**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,	***but***	**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.
Results:		**Results:**		**Results:**
Yes, average (454) vehicles per hour for highest 8 hours		**No, average (41) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 100% of required hourly traffic volume		**Meets 21% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*100% major street / 21% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

Driver sight distance was measured from the side-street approaches, as eastbound and westbound traffic on Palisades Place/Cove Gate Road is required to stop, before making a left-turn or right-turn onto Cook Street. The measured sight distance was derived from the stopping sight distance guidelines found in the California MUTCD ***(see Appendix D)***. In this reference, a 35 MPH roadway speed recommends a minimum Stopping Sight Distance of 250 feet. However, it is likely that the 85th percentile speeds typically exceed the 35 MPH posted speed limit. Therefore, a 40 MPH speed limit was used as a more conservative measure, which has a minimum sight distance of 305 feet.

This 305-foot distance was used when looking towards approaching, uncontrolled traffic along Cook Street. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on Palisades Place and Cove Gate Road at the intersection looking towards the oncoming lanes of cross-traffic on Cook Street. An orange cone was placed at this distance and a photograph was taken from a stopped driver's perspective (i.e., approx. 3.5 feet in height).

(***See sight distance photos in Exhibits 3 & 4 on the following pages***).

As shown on Exhibits 3 & 4, a clear line of sight was achieved when looking from the side-street approaches.

EXHIBIT 3



Eastbound COVE GATE ROAD (*Looking North*) at COOK STREET



Eastbound COVE GATE ROAD (*Looking South*) at COOK STREET

EXHIBIT 4



Westbound PALISADES PLACE (*Looking North*) at COOK STREET



Westbound PALISADES PLACE (*Looking South*) at COOK STREET

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 (i.e., Cook Street). 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 most recent collision history at the intersection resulted in zero (0) SWITRS-reported collisions during the last five 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approach was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. If the California MUTCD criteria are not met, the location is typically not recommended for installation of a multi-way stop.

However, engineering judgment should always be included in any decision regarding traffic safety improvements. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 305 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a medium activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Cook Street at Palisades Place/Cove Gate Road is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (4-way) stop sign installation is not recommended for the intersection of Cook Street and Palisades Place/Cove Gate Rd. There are no other recommendations for the intersection at this time.

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).

Option:

10b YIELD or STOP signs may be used at a channelized turn lane if it is separated from the adjacent travel lanes moving in same direction by an island and the channelized turn lane is not controlled by a traffic control signal.

Standard:

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 Caltrans 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 Caltrans. Refer to CVC 21353.

Support:

17 Caltrans 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.

Section 2B.08 YIELD Sign (R1-2)

Standard:

01 **The YIELD (R1-2) sign (see Figure 2B-1) shall be a downward-pointing equilateral triangle with a wide red border and the legend YIELD in red on a white background.**

Support:

02 The YIELD sign assigns right-of-way to traffic on certain approaches to an intersection. Vehicles controlled by a YIELD sign need to slow down to a speed that is reasonable for the existing conditions or stop when necessary to avoid interfering with conflicting traffic.

Section 2B.09 YIELD Sign Applications

Option:

01 YIELD signs may be installed:

A. On the approaches to a through street or highway where conditions are such that a full stop is not always required.

B. At the second crossroad of a divided highway, where the median width at the intersection is 30 feet or greater. In this case, a STOP or YIELD sign may be installed at the entrance to the first roadway of a divided highway, and a YIELD sign may be installed at the entrance to the second roadway.

C. For a channelized turn lane that is separated from the adjacent travel lanes by an island, even if the adjacent lanes at the intersection are controlled by a highway traffic control signal or by a STOP sign.

D. At an intersection where a special problem exists and where engineering judgment indicates the problem to be susceptible to correction by the use of the YIELD sign.

E. Facing the entering roadway for a merge-type movement if engineering judgment indicates that control is needed because acceleration geometry and/or sight distance is not adequate for merging traffic operation.

Standard:

02 **A YIELD (R1-2) sign shall be used to assign right-of-way at the entrance to a roundabout. YIELD signs at roundabouts shall be used to control the approach roadways and shall not be used to control the circulatory roadway.**

03 **Other than for all of the approaches to a roundabout, YIELD signs shall not be placed on all of the approaches to an intersection.**

Section 2B.10 STOP Sign or YIELD Sign Placement

Standard:

01 **The STOP or YIELD sign shall be installed on the near side of the intersection on the right-hand side of the approach to which it applies. When the STOP or YIELD sign is installed at this required location and the sign visibility is restricted, a Stop Ahead sign (see Section 2C.36) shall be installed in advance of the STOP sign or a Yield Ahead sign (see Section 2C.36) shall be installed in advance of the YIELD sign.**

02 **The STOP or YIELD sign shall be located as close as practical to the intersection it regulates, while optimizing its visibility to the road user it is intended to regulate.**

02a YIELD signs shall not be erected upon the approaches to more than one of the intersecting streets. Refer to CVC 21356.

03 **STOP signs and YIELD signs shall not be mounted on the same post.**

04 **No items other than inventory stickers, sign installation dates, and bar codes shall be affixed to the fronts of STOP or YIELD signs, and the placement of these items shall be in the border of the sign.**

05 **No items other than official traffic control signs, inventory stickers, sign installation dates, anti-vandalism stickers, and bar codes shall be mounted on the backs of STOP or YIELD signs.**

06 **No items other than retroreflective strips (see Section 2A.21) or official traffic control signs shall be mounted on the fronts or backs of STOP or YIELD signs supports.**

APPENDIX B

SWITRS COLLISION HISTORY

CITY OF INDIAN WELLS
INTERSECTION OF COOK STREET AND PALISADES PLACE/COVE GATE ROAD
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.

NO COLLISIONS REPORTED.

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

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

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
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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Cook St & Cove Gate Rd/Palisades Pl

Day: Tuesday
Date: 3/11/2025

Highest 8 Hours per Side-Street Perspective.

City: Indian Wells
Project #: CA25_030013_001

DAILY TOTALS	NB	SB	EB	WB	Total
	2,547	3,203	229	224	6,203

AM Period	NB		SB		EB		WB		TOTAL	
0:00	1		3		0		0		4	
0:15	0		3		0		0		3	
0:30	1		0		0		0		1	
0:45	0	2	1	7	0		0		1	9
1:00	0		1		0		0		1	
1:15	1		0		0		0		1	
1:30	0		1		0		0		1	
1:45	0	1	0	2	0		0		0	3
2:00	1		0		0		0		1	
2:15	0		1		0		0		1	
2:30	0		0		0		0		0	
2:45	0	1	1	2	1	1	0		2	4
3:00	2		1		0		0		3	
3:15	0		0		0		0		0	
3:30	0		0		1		0		1	
3:45	1	3	0	1	0	1	0		1	5
4:00	0		2		0		0		2	
4:15	3		2		0		1		6	
4:30	3		4		0		0		7	
4:45	2	8	9	17	1	1	0	1	12	27
5:00	4		5		0		0		9	
5:15	2		9		0		0		11	
5:30	4		6		0		0		10	
5:45	7	17	16	36	2	2	1	1	26	56
6:00	7		7		0		0		14	
6:15	6		17		1		2		26	
6:30	15		16		2		4		37	
6:45	12	40	44	84	0	3	2	8	58	135
7:00	24		36		2		4		66	
7:15	29		50		3		1		83	
7:30	22		51		2		4		79	
7:45	32	107	67	204	1	8	7	16	107	335
8:00	40		80		3		6		129	
8:15	34		49		8		3		94	
8:30	44		63		2		3		112	
8:45	49	167	71	263	3	16	8	20	131	466
9:00	42		61		6		9		118	
9:15	49		54		3		4		110	
9:30	44		66		7		10		127	
9:45	56	191	64	245	9	25	3	26	132	487
10:00	41		66		4		4		115	
10:15	55		51		13		8		127	
10:30	44		52		8		5		109	
10:45	54	194	41	210	7	32	7	24	109	460
11:00	56		55		3		1		115	
11:15	50		75		7		2		134	
11:30	53		65		5		4		127	
11:45	52	211	49	244	2	17	4	11	107	483
TOTALS		942		1315		106		107		2470
SPLIT %		38.1%		53.2%		4.3%		4.3%		39.8%

PM Period	NB		SB		EB		WB		TOTAL	
12:00	47		69		10		2		128	
12:15	43		65		3		2		113	
12:30	45		57		5		4		111	
12:45	50	185	50	241	5	23	2	10	107	459
13:00	54		58		9		4		125	
13:15	43		65		7		8		123	
13:30	54		58		5		6		123	
13:45	52	203	54	235	4	25	2	20	112	483
14:00	72		51		5		6		134	
14:15	63		91		2		8		164	
14:30	66		60		3		4		133	
14:45	55	256	88	290	4	14	4	22	151	582
15:00	82		60		5		5		152	
15:15	58		57		6		6		127	
15:30	62		61		6		4		133	
15:45	50	252	63	241	6	23	3	18	122	534
16:00	51		74		1		2		128	
16:15	54		53		2		4		113	
16:30	42		49		4		2		97	
16:45	49	196	62	238	3	10	3	11	117	455
17:00	49		64		2		5		120	
17:15	36		54		4		3		97	
17:30	31		53		4		1		89	
17:45	47	163	55	226	2	12	0	9	104	410
18:00	33		42		1		7		83	
18:15	36		38		4		5		83	
18:30	27		37		3		0		67	
18:45	26	122	34	151	0	8	5	17	65	298
19:00	30		24		2		3		59	
19:15	18		26		0		2		46	
19:30	21		20		0		0		41	
19:45	15	84	12	82	1	3	1	6	29	175
20:00	24		20		2		1		47	
20:15	7		19		0		0		26	
20:30	11		18		1		0		30	
20:45	15	57	15	72	0	3	0	1	30	133
21:00	13		22		0		0		35	
21:15	18		10		0		0		28	
21:30	18		13		0		0		31	
21:45	7	56	14	59	1	1	0		22	116
22:00	5		8		1		1		15	
22:15	4		5		0		0		9	
22:30	7		2		0		1		10	
22:45	5	21	10	25	0	1	0	2	15	49
23:00	3		5		0		1		9	
23:15	3		11		0		0		14	
23:30	3		6		0		0		9	
23:45	1	10	6	28	0		0	1	7	39
TOTALS		1605		1888		123		117		3733
SPLIT %		43.0%		50.6%		3.3%		3.1%		60.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	2,547	3,203	229	224	6,203

AM Peak Hour	10:45	8:00	9:45	8:45	9:30
AM Pk Volume	213	263	34	31	501
Pk Hr Factor	0.951	0.822	0.654	0.775	0.949
7 - 9 Volume	274	467	24	36	801
7 - 9 Peak Hour	8:00	8:00	8:00	7:30	8:00
7 - 9 Pk Volume	167	263	16	20	466
Pk Hr Factor	0.852	0.822	0.500	0.714	0.889

PM Peak Hour	14:15	14:15	12:30	13:15	14:15
PM Pk Volume	266	299	26	22	600
Pk Hr Factor	0.811	0.821	0.722	0.688	0.915
4 - 6 Volume	359	464	22	20	865
4 - 6 Peak Hour	16:00	16:00	16:30	16:15	16:00
4 - 6 Pk Volume	196	238	13	14	455
Pk Hr Factor	0.907	0.804	0.813	0.700	0.889

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 - 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.)

*** Posted speed limit, off-peak 85th-percentile speed prior to work starting, or other anticipated operating speed in mph.

Table 6C-2. Stopping Sight Distance as a Function of Speed on Level Roads. (Used as suggested longitudinal buffer space length or location for flagger station)

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 in mph.

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

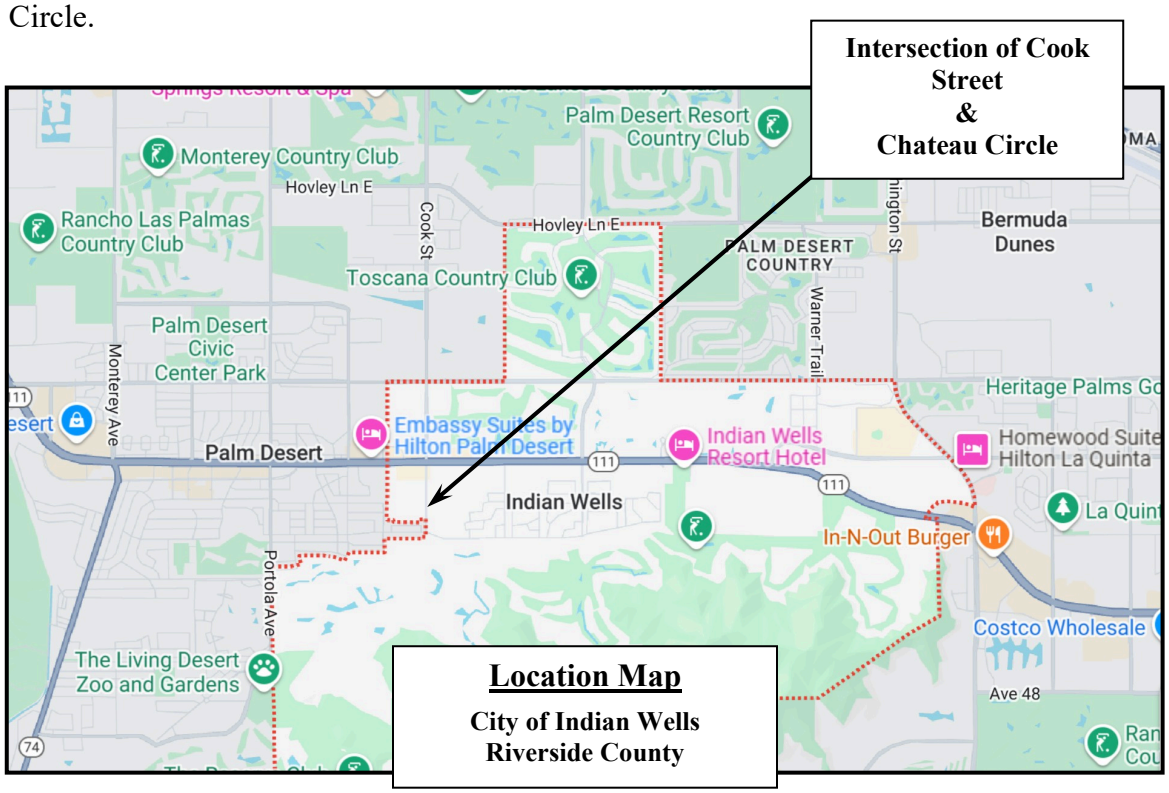
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF COOK STREET AND CHATEAU CIRCLE
IN THE CITY OF INDIAN WELLS, CA
MARCH 6, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Cook Street and Chateau Circle. This analysis was completed in order to verify if a three-way stop sign installation is warranted and recommended based on meeting standard guidelines.

The location is a 3-way intersection with Cook Street running in the north-south directions and Chateau Circle in the east-west directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a one-way STOP sign control installed on Chateau Circle.



Location Map
City of Indian Wells
Riverside County

BACKGROUND

At the subject intersection, **Cook Street** is classified as a north-south major collector roadway with primarily private gated, single-family residential properties on both sides of the street. The roadway is approximately 70 feet wide curb-to-curb. The 3-lane roadway provides for two northbound lanes and one southbound lane of traffic, a northbound left-turn lane, and a bicycle lane in each direction that are separated by a raised, concrete, landscaped center median. The roadway transitions to a 4-lane roadway (two northbound & two southbound) north of the subject intersection with Chateau Circle. There are no marked crosswalks across Cook Street at or near the intersection. The roadway has curb and gutter improvements on both sides of the street. Cook Street has a posted speed limit of 35 MPH, and on-street parking is prohibited on both sides of the street via No Parking Any Time signs. Currently, there are no STOP signs or other types of traffic control on Cook Street (i.e., uncontrolled) at its intersection with Chateau Circle.

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

Chateau Circle is classified as an east-west private, gated local roadway leading to single-family residential properties on both sides of the street. The private roadway is comprised of decorative stone pavement, and measures approximately 60 feet wide curb-to-curb, divided by a raised center landscaped median. The 2-lane roadway provides for one lane of traffic in each direction. There are no marked crosswalks across Chateau Circle. The roadway has curb and gutter improvements on both sides of the street. Chateau Circle has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there is no STOP sign posted on Chateau Circle at its intersection with Cook Street.

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

EXHIBIT 1



COOK STREET (*Looking Northbound*) at CHATEAU CIRCLE



COOK STREET (*Looking Southbound*) at CHATEAU CIRCLE

EXHIBIT 2



CHATEAU CIRCLE (*Looking Eastbound*) at COOK STREET



Looking at Chateau Circle from Opposite Side

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 3-way (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.

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.

MULTIWAY 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. Such crashes include right-turn and left-turn collisions, as well as right-angle collisions (i.e., broadside, or head-on) and pedestrian-vehicle collisions. Other types categorized as 'sideswipe', 'rear-end', and 'hit object' collisions are generally not considered susceptible to correction, unless further review indicates otherwise. The latest available collision history was gathered by HCI from the California Highway Patrol (CHP) Statewide Integrated Traffic Records System website (*i-SWITRS*), which is where local jurisdictions such as cities report their collisions.

Collision History (continued)

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 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?
Cook Street at Chateau Circle		*None reported*		*None reported*		*None reported*		*None reported*

Notes: Information above is derived per the latest 5-year intersection collision database report gathered from CHP-SWITRS (*i-SWITRS website*).

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

As shown, there have been zero (0) reported collisions at or near this intersection over the past (5) years of available SWITRS collision data. 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. ***The prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, March 11, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Cook Street is 5,379 vehicles per day with the highest AM peak-hour volume having 431 vehicles, and 511 vehicles in the PM peak-hour. The bi-directional ADT count for Chateau Circle is 153 vehicles with the highest AM peak-hour volume having 13 vehicles, and 16 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The traffic volume data collected for this intersection is included in Appendix C.***

Traffic Volumes (continued)

TABLE 2
HIGHEST 24-HOUR INTERSECTION APPROACH VEHICLE COUNTS

Street	Direction	ADT Volume	Directional Split	Highest Hourly Volume
Cook Street	Northbound	2,439	45%	244 (2 - 3 PM)
	Southbound	2,940	55%	267 (2 - 3 PM)
Chateau Circle	Eastbound	153	100%	16 (1 - 2 PM)
	Westbound			

Cook Street is considered the 'through' or 'major' street at this intersection since it carries higher volumes from both approaches, and drivers are not required to slow down, or even stop, before proceeding straight through the intersection. In comparison, Chateau Circle is considered the 'minor' street as drivers on this street are required to stop at Cook Street and look both ways before proceeding to make a left-turn or right-turn. It is typically expected that the traffic volumes on the minor street are significantly less than those on the major street. As can be seen from the table above, this is the case, as the minor street carries approximately 3% of the entire vehicular traffic entering the intersection (Cook Street carries 97% of entering traffic).

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 sign installation are reduced to 70%. As mentioned, the posted speed limit on Cook Street is 35 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at/below this posted speed near the intersection, and were considered typical of what may be expected for a three-to-four-lane collector type roadway. As the speed limit is less than the 40+ MPH limit required to reduce traffic volumes, the 70% minimum volumes for a multi-way stop sign analysis are <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the hourly vehicle traffic counts shown in Table 2 above are given for the highest one 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 must also be mentioned that the average hourly minimum volumes required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for 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 collected 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
COOK STREET AT CHATEAU CIRCLE

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,	***and***	**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,	***but***	**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.
Results:		**Results:**		**Results:**
Yes, average (410) vehicles per hour for highest 8 hours		**No, average (13) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 100% of required hourly traffic volume		**Meets 7% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*100% major street / 7% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

Driver sight distance was measured from the side-street approach, as eastbound traffic on Chateau Circle is required to stop, before making a left-turn or right-turn onto Cook Street. The measured sight distance was derived from the stopping sight distance guidelines found in the California MUTCD ***(see Appendix D)***. In this reference, a 35 MPH roadway speed recommends a minimum Stopping Sight Distance of 250 feet. However, it is likely that the 85th percentile speeds typically exceed the 35 MPH posted speed limit. Therefore, a 40 MPH speed limit was used as a more conservative measure, which has a minimum sight distance of 305 feet.

This 305-foot distance was used when looking towards approaching, uncontrolled traffic along Cook Street. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on Chateau Circle at the intersection looking towards the oncoming lanes of cross-traffic on Cook Street. An orange cone was placed at this distance and a photograph was taken from a stopped driver's perspective (i.e., approx. 3.5 feet in height).

(***See sight distance photos in Exhibit 3 on the following page***).

As shown on Exhibit 3, a clear line of sight was achieved when looking from the side-street approach.

EXHIBIT 3



Eastbound CHATEAU CIRCLE (*Looking North*) at COOK STREET



Eastbound CHATEAU CIRCLE (*Looking South*) at COOK STREET

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 (i.e., Cook Street). 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 most recent collision history at the intersection resulted in zero (0) SWITRS-reported collisions during the last five 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approach was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. If the California MUTCD criteria are not met, the location is typically not recommended for installation of a multi-way stop.

However, engineering judgment should always be included in any decision regarding traffic safety improvements. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 305 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a medium activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Cook Street at Chateau Circle is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (3-way) stop sign installation is not recommended for the intersection of Cook Street and Chateau Circle. There are no other recommendations for the intersection at this time.

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).

Option:

10b YIELD or STOP signs may be used at a channelized turn lane if it is separated from the adjacent travel lanes moving in same direction by an island and the channelized turn lane is not controlled by a traffic control signal.

Standard:

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 Caltrans 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 Caltrans. Refer to CVC 21353.

Support:

17 Caltrans 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.

Section 2B.08 YIELD Sign (R1-2)

Standard:

01 **The YIELD (R1-2) sign (see Figure 2B-1) shall be a downward-pointing equilateral triangle with a wide red border and the legend YIELD in red on a white background.**

Support:

02 The YIELD sign assigns right-of-way to traffic on certain approaches to an intersection. Vehicles controlled by a YIELD sign need to slow down to a speed that is reasonable for the existing conditions or stop when necessary to avoid interfering with conflicting traffic.

Section 2B.09 YIELD Sign Applications

Option:

01 YIELD signs may be installed:

A. On the approaches to a through street or highway where conditions are such that a full stop is not always required.

B. At the second crossroad of a divided highway, where the median width at the intersection is 30 feet or greater. In this case, a STOP or YIELD sign may be installed at the entrance to the first roadway of a divided highway, and a YIELD sign may be installed at the entrance to the second roadway.

C. For a channelized turn lane that is separated from the adjacent travel lanes by an island, even if the adjacent lanes at the intersection are controlled by a highway traffic control signal or by a STOP sign.

D. At an intersection where a special problem exists and where engineering judgment indicates the problem to be susceptible to correction by the use of the YIELD sign.

E. Facing the entering roadway for a merge-type movement if engineering judgment indicates that control is needed because acceleration geometry and/or sight distance is not adequate for merging traffic operation.

Standard:

02 **A YIELD (R1-2) sign shall be used to assign right-of-way at the entrance to a roundabout. YIELD signs at roundabouts shall be used to control the approach roadways and shall not be used to control the circulatory roadway.**

03 **Other than for all of the approaches to a roundabout, YIELD signs shall not be placed on all of the approaches to an intersection.**

Section 2B.10 STOP Sign or YIELD Sign Placement

Standard:

01 **The STOP or YIELD sign shall be installed on the near side of the intersection on the right-hand side of the approach to which it applies. When the STOP or YIELD sign is installed at this required location and the sign visibility is restricted, a Stop Ahead sign (see Section 2C.36) shall be installed in advance of the STOP sign or a Yield Ahead sign (see Section 2C.36) shall be installed in advance of the YIELD sign.**

02 **The STOP or YIELD sign shall be located as close as practical to the intersection it regulates, while optimizing its visibility to the road user it is intended to regulate.**

02a YIELD signs shall not be erected upon the approaches to more than one of the intersecting streets. Refer to CVC 21356.

03 **STOP signs and YIELD signs shall not be mounted on the same post.**

04 **No items other than inventory stickers, sign installation dates, and bar codes shall be affixed to the fronts of STOP or YIELD signs, and the placement of these items shall be in the border of the sign.**

05 **No items other than official traffic control signs, inventory stickers, sign installation dates, anti-vandalism stickers, and bar codes shall be mounted on the backs of STOP or YIELD signs.**

06 **No items other than retroreflective strips (see Section 2A.21) or official traffic control signs shall be mounted on the fronts or backs of STOP or YIELD signs supports.**

APPENDIX B

SWITRS COLLISION HISTORY

CITY OF INDIAN WELLS
INTERSECTION OF COOK STREET AND CHATEAU CIRCLE
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.

NO COLLISIONS REPORTED.

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

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

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
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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Cook St & Chateau Cir

Day: Tuesday
Date: 3/11/2025

Highest 8 Hours per Side-Street Perspective.

City: Indian Wells
Project #: CA25_030013_002

DAILY TOTALS	NB	SB	EB	WB	Total
	2,439	2,940	153	0	5,532

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00	1		3		0				4		12:00	46		56		2				104	
0:15	0		3		0				3		12:15	42		55		2				99	
0:30	1		0		0				1		12:30	43		53		2				98	
0:45	0	2	1	7	0				1	9	12:45	50	181	44	208	3	9			97	398
1:00	0		1		0				1		13:00	55		54		4				113	
1:15	1		0		0				1		13:15	37		60		5				102	
1:30	0		1		0				1		13:30	53		56		5				114	
1:45	0	1	0	2	0				0	3	13:45	52	197	50	220	2	16			104	433
2:00	1		0		0				1		14:00	69		45		5				119	
2:15	0		1		0				1		14:15	60		85		2				147	
2:30	0		0		0				0		14:30	67		58		0				125	
2:45	0	1	1	2	1	1			2	4	14:45	48	244	79	267	8	15			135	526
3:00	2		1		0				3		15:00	84		53		0				137	
3:15	0		0		0				0		15:15	52		48		4				104	
3:30	0		0		0				0		15:30	60		57		4				121	
3:45	1	3	0	1	0				1	4	15:45	46	242	61	219	3	11			110	472
4:00	1		2		0				3		16:00	43		63		7				113	
4:15	2		3		0				5		16:15	54		47		1				102	
4:30	3		4		0				7		16:30	37		51		2				90	
4:45	1	7	10	19	1	1			12	27	16:45	51	185	58	219	4	14			113	418
5:00	4		5		0				9		17:00	49		52		1				102	
5:15	1		8		1				10		17:15	34		54		2				90	
5:30	5		5		0				10		17:30	31		50		1				82	
5:45	5	15	19	37	3	4			27	56	17:45	44	158	51	207	2	6			97	371
6:00	7		6		0				13		18:00	33		33		0				66	
6:15	6		17		0				23		18:15	31		37		6				74	
6:30	15		16		0				31		18:30	25		31		2				58	
6:45	12	40	43	82	2	2			57	124	18:45	22	111	35	136	3	11			60	258
7:00	21		34		2				57		19:00	27		19		3				49	
7:15	25		43		4				72		19:15	17		22		0				39	
7:30	20		45		1				66		19:30	21		18		0				39	
7:45	31	97	68	190	1	8			100	295	19:45	15	80	11	70	1	4			27	154
8:00	37		78		3				118		20:00	24		16		0				40	
8:15	32		47		3				82		20:15	7		17		0				24	
8:30	44		56		4				104		20:30	12		17		0				29	
8:45	48	161	70	251	3	13			121	425	20:45	13	56	14	64	0				27	120
9:00	44		49		4				97		21:00	13		21		0				34	
9:15	46		53		2				101		21:15	19		11		0				30	
9:30	39		54		4				97		21:30	17		12		0				29	
9:45	54	183	56	212	3	13			113	408	21:45	8	57	15	59	0				23	116
10:00	41		60		1				102		22:00	3		8		1				12	
10:15	51		44		2				97		22:15	4		5		0				9	
10:30	42		50		3				95		22:30	7		2		0				9	
10:45	50	184	37	191	4	10			91	385	22:45	5	19	10	25	0	1			15	45
11:00	54		49		2				105		23:00	3		6		0				9	
11:15	49		71		2				122		23:15	2		11		1				14	
11:30	52		61		6				119		23:30	3		5		0				8	
11:45	51	206	44	225	3	13			98	444	23:45	1	9	5	27	0	1			6	37
TOTALS		900		1219		65				2184	TOTALS		1539		1721		88				3348
SPLIT %		41.2%		55.8%		3.0%				39.5%	SPLIT %		46.0%		51.4%		2.6%				60.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	2,439	2,940	153	0	5,532

AM Peak Hour	11:00	8:00	8:15		11:00	PM Peak Hour	14:15	14:15	15:15		14:15
AM Pk Volume	206	251	14		444	PM Pk Volume	259	275	18		544
Pk Hr Factor	0.954	0.804	0.875		0.910	Pk Hr Factor	0.771	0.809	0.643		0.925
7 - 9 Volume	258	441	21	0	720	4 - 6 Volume	343	426	20	0	789
7 - 9 Peak Hour	8:00	8:00	8:00		8:00	4 - 6 Peak Hour	16:15	16:00	16:00		16:00
7 - 9 Pk Volume	161	251	13	0	425	4 - 6 Pk Volume	191	219	14	0	418
Pk Hr Factor	0.839	0.804	0.813	0.000	0.878	Pk Hr Factor	0.884	0.869	0.500	0.000	0.925

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 - 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.)

*** Posted speed limit, off-peak 85th-percentile speed prior to work starting, or other anticipated operating speed in mph.

Table 6C-2. Stopping Sight Distance as a Function of Speed on Level Roads. (Used as suggested longitudinal buffer space length or location for flagger station)

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 in mph.

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

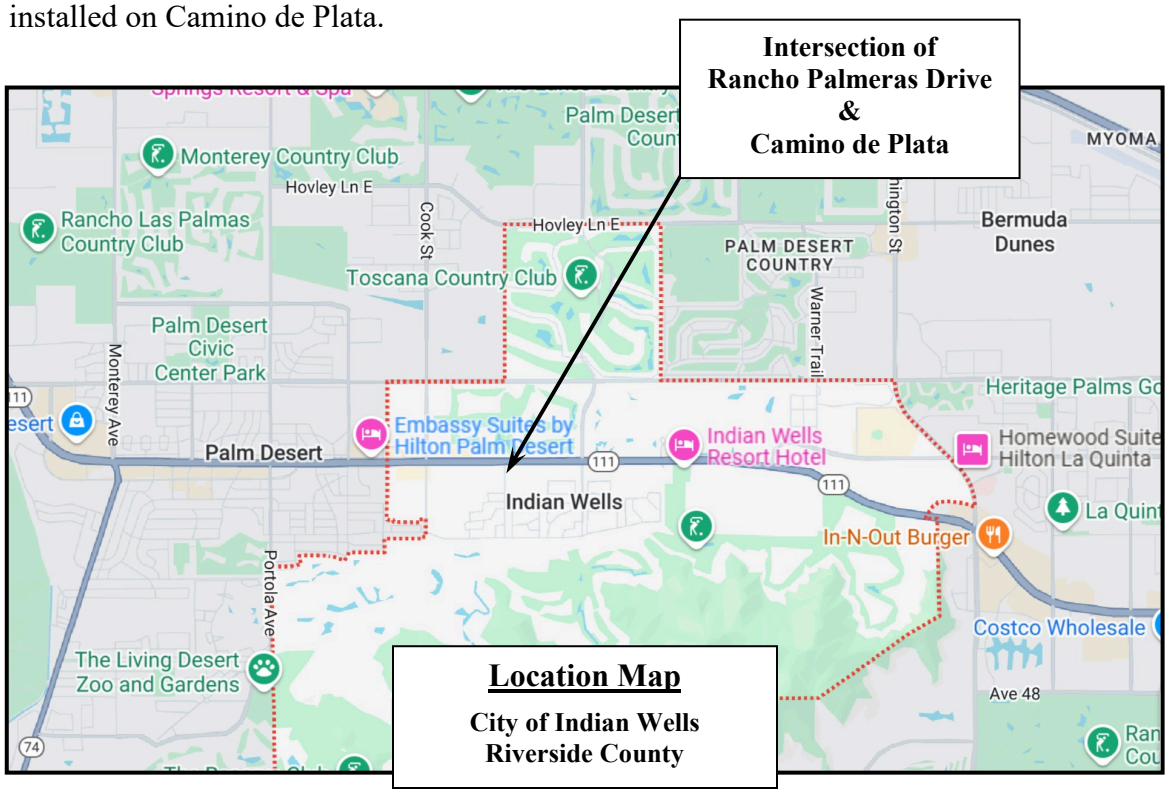
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF RANCHO PALMERAS DRIVE AND CAMINO DE PLATA IN THE CITY OF INDIAN WELLS, CA MARCH 7, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Rancho Palmeras Drive and Camino de Plata. This analysis was completed in order to verify if a four-way stop sign installation is warranted and recommended based on meeting standard guidelines.

The location is a 4-way intersection with Rancho Palmeras Drive running in the north-south directions and Camino de Plata in the east-west directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a two-way STOP sign control installed on Camino de Plata.



Location Map
City of Indian Wells
Riverside County

BACKGROUND

At the subject intersection, **Rancho Palmeras Drive** is classified as a north-south collector roadway with primarily single-family residential properties on both sides of the street. The roadway is approximately 56 feet wide curb-to-curb. The 2-lane roadway provides for one lane of traffic in each direction that are separated by a raised, concrete, landscaped center median. There are no marked crosswalks across Rancho Palmeras Drive at or near the intersection. The roadway has curb and gutter improvements on both sides of the street. Rancho Palmeras Drive has a posted speed limit of 35 MPH, and on-street parking is allowed on both sides of the street. Currently, there are no STOP signs or other types of traffic control on Rancho Palmeras Drive (i.e., uncontrolled) at its intersection with Camino de Plata.

See Exhibit 1 (next page) for photo images of Rancho Palmeras Drive.

Camino de Plata is classified as an east-west public and private, gated local roadway leading to single-family residential properties on both sides of the street. The private east leg of the intersection provides vehicular access through an automatic gate. The public roadway measures approximately 32 feet wide curb-to-curb. The 2-lane roadway provides for one lane of traffic in each direction which are not separated by any centerline striping. There are no marked crosswalks across Camino de Plata. The roadway has curb and gutter improvements on both sides of the street. Camino de Plata has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there are two STOP signs posted on the Camino de Plata approaches to the intersection with Rancho Palmeras Drive.

See Exhibit 2 (following page) for photo images of Camino de Plata.

EXHIBIT 1



RANCHO PALMERAS DRIVE (*Looking Northbound*) at CAMINO DE PLATA



RANCHO PALMERAS DRIVE (*Looking Southbound*) at CAMINO DE PLATA

EXHIBIT 2



CAMINO DE PLATA (*Looking Eastbound*) at RANCHO PALMERAS DRIVE



CAMINO DE PLATA (*Looking Westbound*) at RANCHO PALMERAS DRIVE

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 4-way (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.

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.

MULTIWAY 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. Such crashes include right-turn and left-turn collisions, as well as right-angle collisions (i.e., broadside, or head-on) and pedestrian-vehicle collisions. Other types categorized as 'sideswipe', 'rear-end', and 'hit object' collisions are generally not considered susceptible to correction, unless further review indicates otherwise. The latest available collision history was gathered by HCI from the California Highway Patrol (CHP) Statewide Integrated Traffic Records System website (*i-SWITRS*), which is where local jurisdictions such as cities report their collisions.

Collision History (continued)

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 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**
Rancho Palmeras Dr at Camino de Plata		*None reported*		*None reported*		*None reported*		*None reported*

Notes: Information above is derived per the latest 5-year intersection collision database report gathered from CHP-SWITRS (*i-SWITRS website*).

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

As shown, there have been zero (0) reported collisions at or near this intersection over the past (5) years of available SWITRS collision data. 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. ***The prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, March 11, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Rancho Palmeras Drive is 1,076 vehicles per day with the highest AM peak-hour volume having 99 vehicles, and 98 vehicles in the PM peak-hour. The bi-directional ADT count for Camino de Plata is 318 vehicles with the highest AM peak-hour volume having 35 vehicles, and 28 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The traffic volume data collected for this intersection is included in Appendix C.***

Traffic Volumes (continued)

TABLE 2
HIGHEST 24-HOUR INTERSECTION APPROACH VEHICLE COUNTS

Street	Direction	ADT Volume	Directional Split	Highest Hourly Volume
Rancho Palmeras Drive	Northbound	492	46%	51 (11 AM - 12 PM)
	Southbound	584	54%	54 (8 - 9 AM)
Camino de Plata	Eastbound	154	48%	17 (9 - 10 AM)
	Westbound	164	52%	19 (10 - 11 AM)

Rancho Palmeras Drive is considered the 'through' or 'major' street at this residential intersection since it carries higher volumes from both approaches, and drivers are not required to slow down, or even stop, before proceeding straight through the intersection. In comparison, Camino de Plata is considered the 'minor' street as drivers on this street are required to stop at Rancho Palmeras Drive and look both ways before proceeding to make a left-turn or right-turn. It is typically expected that the traffic volumes on the minor street are significantly less than those on the major street. As can be seen from the table above, this is the case, as the minor street carries approximately 23% of the entire vehicular traffic entering the intersection (Rancho Palmeras Drive carries 77%).

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 sign installation are reduced to 70%. As mentioned, the posted speed limit on Rancho Palmeras Drive is 35 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at/below this posted speed near the intersection, and were considered typical of what may be expected for a two-lane collector type roadway. As the speed limit is less than the 40+ MPH limit required to reduce traffic volumes, the 70% minimum volumes for a multi-way stop sign analysis are <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the hourly vehicle traffic counts shown in Table 2 above are given for the highest one 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 must also be mentioned that the average hourly minimum volumes required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for 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 collected 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
RANCHO PALMERAS DRIVE AT CAMINO DE PLATA

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,	***and***	**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,	***but***	**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.
Results:		**Results:**		**Results:**
No, average (86) vehicles per hour for highest 8 hours		**No, average (29) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 29% of required hourly traffic volume		**Meets 15% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*29% major street / 15% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

Driver sight distance was measured from the side-street approach, as eastbound and westbound traffic on Camino de Plata is required to stop, before making a left-turn or right-turn onto Rancho Palmeras Drive. The measured sight distance was derived from the stopping sight distance guidelines found in the California MUTCD ***(see Appendix D)***. In this reference, a 35 MPH roadway speed recommends a minimum Stopping Sight Distance of 250 feet. However, it is likely that the 85th percentile speeds typically exceed the 35 MPH posted speed limit. Therefore, a 40 MPH speed limit was used as a more conservative measure, which has a minimum sight distance of 305 feet.

This 305-foot distance was used when looking towards approaching, uncontrolled traffic along Rancho Palmeras Drive. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on Camino de Plata at the intersection looking towards the oncoming lanes of cross-traffic on Rancho Palmeras Drive. An orange cone was placed at this distance and a photograph was taken from a stopped driver's perspective (i.e., approx. 3.5 feet in height).

(***See sight distance photos in Exhibits 3 and 4 on the following pages***).

As shown on Exhibits 3 and 4, a clear line of sight was achieved when looking from both side-street approaches.

EXHIBIT 3



Eastbound CAMINO DE PLATA (*Looking North*) at RANCHO PALMERAS DRIVE



Eastbound CAMINO DE PLATA (*Looking South*) at RANCHO PALMERAS DRIVE

EXHIBIT 4



Westbound CAMINO DE PLATA (*Looking North*) at RANCHO PALMERAS DRIVE



Westbound CAMINO DE PLATA (*Looking South*) @ RANCHO PALMERAS DRIVE

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 (i.e., Rancho Palmeras Drive). 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 most recent collision history at the intersection resulted in zero (0) SWITRS-reported collisions during the last five 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approach was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. If the California MUTCD criteria are not met, the location is typically not recommended for installation of a multi-way stop.

However, engineering judgment should always be included in any decision regarding traffic safety improvements. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 305 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a medium activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Ranchero Palmeras Drive at Camino de Plata is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (4-way) stop sign installation is not recommended for the intersection of Rancho Palmeras Drive and Camino de Plata. There are no other recommendations for the intersection at this time.

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).

Option:

10b YIELD or STOP signs may be used at a channelized turn lane if it is separated from the adjacent travel lanes moving in same direction by an island and the channelized turn lane is not controlled by a traffic control signal.

Standard:

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 Caltrans 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 Caltrans. Refer to CVC 21353.

Support:

17 Caltrans 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.

Section 2B.08 YIELD Sign (R1-2)

Standard:

01 **The YIELD (R1-2) sign (see Figure 2B-1) shall be a downward-pointing equilateral triangle with a wide red border and the legend YIELD in red on a white background.**

Support:

02 The YIELD sign assigns right-of-way to traffic on certain approaches to an intersection. Vehicles controlled by a YIELD sign need to slow down to a speed that is reasonable for the existing conditions or stop when necessary to avoid interfering with conflicting traffic.

Section 2B.09 YIELD Sign Applications

Option:

01 YIELD signs may be installed:

A. On the approaches to a through street or highway where conditions are such that a full stop is not always required.

B. At the second crossroad of a divided highway, where the median width at the intersection is 30 feet or greater. In this case, a STOP or YIELD sign may be installed at the entrance to the first roadway of a divided highway, and a YIELD sign may be installed at the entrance to the second roadway.

C. For a channelized turn lane that is separated from the adjacent travel lanes by an island, even if the adjacent lanes at the intersection are controlled by a highway traffic control signal or by a STOP sign.

D. At an intersection where a special problem exists and where engineering judgment indicates the problem to be susceptible to correction by the use of the YIELD sign.

E. Facing the entering roadway for a merge-type movement if engineering judgment indicates that control is needed because acceleration geometry and/or sight distance is not adequate for merging traffic operation.

Standard:

02 **A YIELD (R1-2) sign shall be used to assign right-of-way at the entrance to a roundabout. YIELD signs at roundabouts shall be used to control the approach roadways and shall not be used to control the circulatory roadway.**

03 **Other than for all of the approaches to a roundabout, YIELD signs shall not be placed on all of the approaches to an intersection.**

Section 2B.10 STOP Sign or YIELD Sign Placement

Standard:

01 **The STOP or YIELD sign shall be installed on the near side of the intersection on the right-hand side of the approach to which it applies. When the STOP or YIELD sign is installed at this required location and the sign visibility is restricted, a Stop Ahead sign (see Section 2C.36) shall be installed in advance of the STOP sign or a Yield Ahead sign (see Section 2C.36) shall be installed in advance of the YIELD sign.**

02 **The STOP or YIELD sign shall be located as close as practical to the intersection it regulates, while optimizing its visibility to the road user it is intended to regulate.**

02a YIELD signs shall not be erected upon the approaches to more than one of the intersecting streets. Refer to CVC 21356.

03 **STOP signs and YIELD signs shall not be mounted on the same post.**

04 **No items other than inventory stickers, sign installation dates, and bar codes shall be affixed to the fronts of STOP or YIELD signs, and the placement of these items shall be in the border of the sign.**

05 **No items other than official traffic control signs, inventory stickers, sign installation dates, anti-vandalism stickers, and bar codes shall be mounted on the backs of STOP or YIELD signs.**

06 **No items other than retroreflective strips (see Section 2A.21) or official traffic control signs shall be mounted on the fronts or backs of STOP or YIELD signs supports.**

APPENDIX B

SWITRS COLLISION HISTORY

CITY OF INDIAN WELLS
INTERSECTION OF RANCHERO PALMERAS DRIVE AND CAMINO DE PLATA
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.

NO COLLISIONS REPORTED.

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

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

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
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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Rancho Palmeras Dr & Camino De Plata N

Day: Tuesday
Date: 3/11/2025

Highest 8 Hours per Side-Street Perspective.

City: Indian Wells
Project #: CA25_030013_007

DAILY TOTALS	NB	SB	EB	WB	Total
	492	584	154	164	1,394

AM Period	NB		SB		EB		WB		TOTAL	
0:00	2		2		0		0		4	
0:15	0		0		0		0		0	
0:30	0		0		0		0		0	
0:45	0	2	0	2	0		0		0	4
1:00	0		1		0		0		1	
1:15	0		0		0		0		0	
1:30	0		0		0		0		0	
1:45	0		0	1	0		0		0	1
2:00	0		0		0		0		0	
2:15	0		0		0		0		0	
2:30	0		0		0		0		0	
2:45	0		0		0		0		0	
3:00	0		0		0		0		0	
3:15	0		0		0		0		0	
3:30	0		0		0		0		0	
3:45	0		1	1	0		0		1	1
4:00	1		1		0		0		2	
4:15	0		0		0		0		0	
4:30	1		2		0		0		3	
4:45	0	2	0	3	0		0		0	5
5:00	0		0		0		0		0	
5:15	3		1		1		1		6	
5:30	3		0		0		1		4	
5:45	2	8	0	1	0	1	0	2	2	12
6:00	3		2		0		0		5	
6:15	0		0		2		0		2	
6:30	2		2		0		0		4	
6:45	4	9	8	12	3	5	1	1	16	27
7:00	10		11		2		5		28	
7:15	2		5		1		0		8	
7:30	4		6		0		1		11	
7:45	6	22	8	30	4	7	2	8	20	67
8:00	2		13		2		1		18	
8:15	7		19		1		3		30	
8:30	12		13		4		3		32	
8:45	3	24	9	54	3	10	1	8	16	96
9:00	8		15		7		1		31	
9:15	7		8		4		3		22	
9:30	10		11		3		5		29	
9:45	10	35	7	41	3	17	9	18	29	111
10:00	14		6		3		3		26	
10:15	10		9		2		6		27	
10:30	9		14		4		5		32	
10:45	12	45	11	40	6	15	5	19	34	119
11:00	10		10		5		1		26	
11:15	16		11		6		5		38	
11:30	16		12		2		3		33	
11:45	9	51	15	48	1	14	10	19	35	132
TOTALS		198		233		69		75		575
SPLIT %		34.4%		40.5%		12.0%		13.0%		41.2%

PM Period	NB		SB		EB		WB		TOTAL	
12:00	13		16		2		5		36	
12:15	12		11		3		5		31	
12:30	12		8		3		5		28	
12:45	10	47	16	51	4	12	1	16	31	126
13:00	12		16		5		1		34	
13:15	15		8		3		4		30	
13:30	13		12		4		5		34	
13:45	9	49	10	46	3	15	3	13	25	123
14:00	13		8		5		4		30	
14:15	5		8		0		2		15	
14:30	11		11		6		1		29	
14:45	14	43	6	33	2	13	4	11	26	100
15:00	9		15		1		6		31	
15:15	15		11		3		3		32	
15:30	14		11		2		0		27	
15:45	9	47	7	44	3	9	5	14	24	114
16:00	4		9		2		7		22	
16:15	11		9		8		2		30	
16:30	11		8		2		1		22	
16:45	3	29	10	36	1	13	2	12	16	90
17:00	9		12		1		3		25	
17:15	6		10		2		2		20	
17:30	2		17		2		2		23	
17:45	4	21	8	47	2	7	3	10	17	85
18:00	9		8		2		3		22	
18:15	11		5		1		0		17	
18:30	5		10		1		3		19	
18:45	1	26	6	29	1	5	2	8	10	68
19:00	4		6		2		2		14	
19:15	1		7		2		0		10	
19:30	2		8		0		1		11	
19:45	8	15	7	28	1	5	1	4	17	52
20:00	2		2		0		0		4	
20:15	0		7		2		0		9	
20:30	5		3		3		0		11	
20:45	0	7	3	15	0	5	0		3	27
21:00	1		4		0		1		6	
21:15	0		4		0		0		4	
21:30	2		1		0		0		3	
21:45	4	7	7	16	1	1	0	1	12	25
22:00	1		0		0		0		1	
22:15	0		1		0		0		1	
22:30	1		1		0		0		2	
22:45	1	3	1	3	0		0		2	6
23:00	0		0		0		0		0	
23:15	0		1		0		0		1	
23:30	0		2		0		0		2	
23:45	0		0	3	0		0		0	3
TOTALS		294		351		85		89		819
SPLIT %		35.9%		42.9%		10.4%		10.9%		58.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	492	584	154	164	1,394

AM Peak Hour	10:45	8:15	10:30	11:45	**11:15**
AM Pk Volume	54	56	21	25	**142**
Pk Hr Factor	0.844	0.737	0.875	0.625	**0.934**
7 - 9 Volume	46	84	17	16	**163**
7 - 9 Peak Hour	7:45	8:00	7:45	7:45	**7:45**
7 - 9 Pk Volume	27	54	11	9	**100**
Pk Hr Factor	0.563	0.711	0.688	0.750	**0.781**

PM Peak Hour	14:45	12:45	12:45	12:00	**12:45**
PM Pk Volume	52	52	16	16	**129**
Pk Hr Factor	0.867	0.813	0.800	0.800	**0.949**
4 - 6 Volume	50	83	20	22	**175**
4 - 6 Peak Hour	16:15	16:45	16:00	16:00	**16:15**
4 - 6 Pk Volume	34	49	13	12	**93**
Pk Hr Factor	0.773	0.721	0.406	0.429	**0.775**

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 - 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.)

*** Posted speed limit, off-peak 85th-percentile speed prior to work starting, or other anticipated operating speed in mph.

Table 6C-2. Stopping Sight Distance as a Function of Speed on Level Roads. (Used as suggested longitudinal buffer space length or location for flagger station)

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 in mph.

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

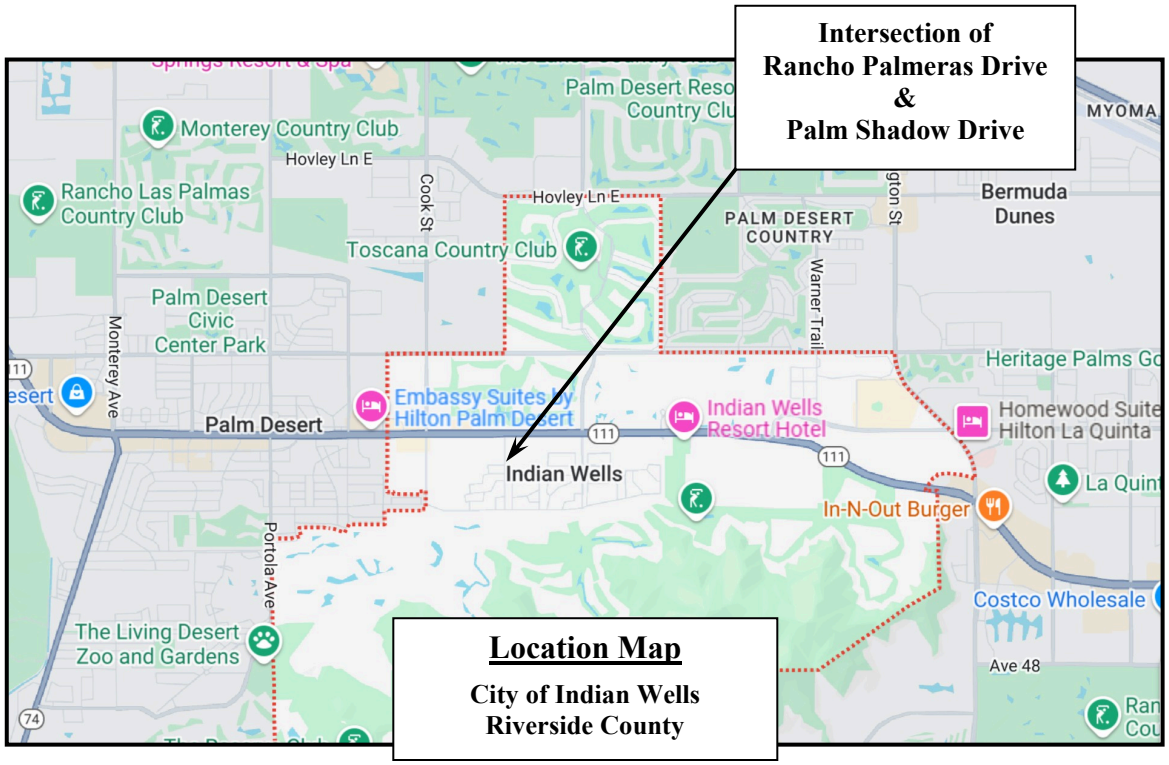
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF RANCHO PALMERAS DRIVE AND PALM SHADOW DRIVE IN THE CITY OF INDIAN WELLS, CA MARCH 10, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Rancho Palmeras Drive and Palm Shadow Drive. This analysis was completed in order to verify if a three-way stop sign installation is warranted and recommended based on meeting standard guidelines.

The location is a 3-way intersection with Rancho Palmeras Drive running in the north-south directions and Palm Shadow Drive in the east-west directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a one-way STOP sign control installed on Palm Shadow Drive.



BACKGROUND

At the subject intersection, **Rancho Palmeras Drive** is classified as a north-south collector roadway with primarily single-family residential properties on both sides of the street. The roadway is approximately 56 feet wide curb-to-curb. The 2-lane roadway provides for one lane of traffic in each direction that are separated by a raised, concrete, landscaped center median on the north leg and a northbound left-turn lane on the south leg. There are no marked crosswalks across Rancho Palmeras Drive at or near the intersection. The roadway has curb and gutter improvements on both sides of the street. Rancho Palmeras Drive has a posted speed limit of 35 MPH, and on-street parking is allowed on both sides of the street. Currently, there are no STOP signs or other types of traffic control on Rancho Palmeras Drive (i.e., uncontrolled) at its intersection with Palm Shadow Drive.

See Exhibit 1 (next page) for photo images of Rancho Palmeras Drive.

Palm Shadow Drive is classified as an east-west local roadway leading to single-family residential properties on both sides of the street. The roadway measures approximately 36 feet wide curb-to-curb. The 2-lane roadway provides for one lane of traffic in each direction which are not separated by any centerline striping. There are no marked crosswalks across Palm Shadow Drive. The roadway has curb and gutter improvements on both sides of the street. Palm Shadow Drive has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there is one STOP sign posted, as well as a STOP pavement marking and limit line, on the Palm Shadow Drive approach to the intersection with Rancho Palmeras Drive.

See Exhibit 2 (following page) for a photo image of Palm Shadow Drive.

EXHIBIT 1



RANCHO PALMERAS DRIVE (*Looking Northbound*) at PALM SHADOW DRIVE



RANCHO PALMERAS DRIVE (*Looking Southbound*) at PALM SHADOW DRIVE

EXHIBIT 2



PALM SHADOW DRIVE (*Looking Eastbound*) at RANCHO PALMERAS DRIVE

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 3-way (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.

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.

MULTIWAY 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. Such crashes include right-turn and left-turn collisions, as well as right-angle collisions (i.e., broadside, or head-on) and pedestrian-vehicle collisions. Other types categorized as 'sideswipe', 'rear-end', and 'hit object' collisions are generally not considered susceptible to correction, unless further review indicates otherwise. The latest available collision history was gathered by HCI from the California Highway Patrol (CHP) Statewide Integrated Traffic Records System website (*i-SWITRS*), which is where local jurisdictions such as cities report their collisions.

Collision History (continued)

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 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**
Rancho Palmeras at Palm Shadow		*None reported*		*None reported*		*None reported*		*None reported*

Notes: Information above is derived per the latest 5-year intersection collision database report gathered from CHP-SWITRS (*i-SWITRS website*).

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

As shown, there have been zero (0) reported collisions at or near this intersection over the past (5) years of available SWITRS collision data. 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. ***The prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, March 11, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Rancho Palmeras Drive is 973 vehicles per day with the highest AM peak-hour volume having 91 vehicles, and 86 vehicles in the PM peak-hour. The directional ADT count for Palm Shadow Drive is 88 vehicles with the highest AM peak-hour volume having 9 vehicles, and 11 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The traffic volume data collected for this intersection is included in Appendix C.***

Traffic Volumes (continued)

TABLE 2
HIGHEST 24-HOUR INTERSECTION APPROACH VEHICLE COUNTS

Street	Direction	ADT Volume	Directional Split	Highest Hourly Volume
Rancho Palmeras Drive	Northbound	436	45%	47 (11 AM - 12 PM)
	Southbound	537	55%	51 (8 - 9 AM)
Palm Shadow Drive	Eastbound	88	100%	11 (12 - 1 PM)

Rancho Palmeras Drive is considered the 'through' or 'major' street at this residential T-intersection since it carries higher volumes from both approaches, and drivers are not required to slow down, or even stop, before proceeding straight through the intersection. In comparison, Palm Shadow Drive is considered the 'minor' street as drivers are required to stop at Rancho Palmeras Drive and look both ways before proceeding to make a left-turn or right-turn. It is typically expected that the traffic volumes on the minor street are significantly less than those on the major street. As can be seen from the table above, this is the case, as the minor street carries approximately 8% of the entire vehicular traffic entering the intersection (Rancho Palmeras Drive carries 92%).

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 sign installation are reduced to 70%. As mentioned, the posted speed limit on Rancho Palmeras Drive is 35 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at/below this posted speed near the intersection, and were considered typical of what may be expected for a two-lane collector type roadway. As the speed limit is less than the 40+ MPH limit required to reduce traffic volumes, the 70% minimum volumes for a multi-way stop sign analysis are <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the hourly vehicle traffic counts shown in Table 2 above are given for the highest one 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 must also be mentioned that the average hourly minimum volumes required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for 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 collected 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
RANCHO PALMERAS DRIVE AT PALM SHADOW DRIVE

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,	***and***	**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,	***but***	**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.
Results:		**Results:**		**Results:**
No, average (80) vehicles per hour for highest 8 hours		**No, average (8) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 27% of required hourly traffic volume		**Meets 4% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*27% major street / 4% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

Driver sight distance was measured from the side-street approach, as eastbound traffic on Palm Shadow Drive is required to stop, before making a left-turn or right-turn onto Rancho Palmeras Drive. The measured sight distance was derived from the stopping sight distance guidelines found in the California MUTCD ***(see Appendix D)***. In this reference, a 35 MPH roadway speed recommends a minimum Stopping Sight Distance of 250 feet. However, it is likely that the 85th percentile speeds typically exceed the 35 MPH posted speed limit. Therefore, a 40 MPH speed limit was used as a more conservative measure, which has a minimum sight distance of 305 feet.

This 305-foot distance was used when looking towards approaching, uncontrolled traffic along Rancho Palmeras Drive. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on Palm Shadow Drive at the intersection looking towards the oncoming lanes of cross-traffic on Rancho Palmeras Drive. An orange cone was placed at this distance and a photograph was taken from a stopped driver's perspective (i.e., approx. 3.5 feet in height).

(***See sight distance photos in Exhibit 3 on the following page***).

As shown on Exhibit 3, a clear line of sight was achieved when looking from the side-street approach.

EXHIBIT 3



Eastbound PALM SHADOW DRIVE (*Looking North*) at RANCHO PALMERAS DRIVE



Eastbound PALM SHADOW DRIVE (*Looking South*) at RANCHO PALMERAS DRIVE

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 (i.e., Rancho Palmeras Drive). 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 most recent collision history at the intersection resulted in zero (0) SWITRS-reported collisions during the last five 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approach was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. If the California MUTCD criteria are not met, the location is typically not recommended for installation of a multi-way stop.

However, engineering judgment should always be included in any decision regarding traffic safety improvements. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 305 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a medium activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Ranchero Palmeras Drive at Palm Shadow Drive is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (3-way) stop sign installation is not recommended for the intersection of Rancho Palmeras Drive and Palm Shadow Drive. There are no other recommendations for the intersection at this time.

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).

Option:

10b YIELD or STOP signs may be used at a channelized turn lane if it is separated from the adjacent travel lanes moving in same direction by an island and the channelized turn lane is not controlled by a traffic control signal.

Standard:

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 Caltrans 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 Caltrans. Refer to CVC 21353.

Support:

17 Caltrans 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.

Section 2B.08 YIELD Sign (R1-2)

Standard:

01 **The YIELD (R1-2) sign (see Figure 2B-1) shall be a downward-pointing equilateral triangle with a wide red border and the legend YIELD in red on a white background.**

Support:

02 The YIELD sign assigns right-of-way to traffic on certain approaches to an intersection. Vehicles controlled by a YIELD sign need to slow down to a speed that is reasonable for the existing conditions or stop when necessary to avoid interfering with conflicting traffic.

Section 2B.09 YIELD Sign Applications

Option:

01 YIELD signs may be installed:

A. On the approaches to a through street or highway where conditions are such that a full stop is not always required.

B. At the second crossroad of a divided highway, where the median width at the intersection is 30 feet or greater. In this case, a STOP or YIELD sign may be installed at the entrance to the first roadway of a divided highway, and a YIELD sign may be installed at the entrance to the second roadway.

C. For a channelized turn lane that is separated from the adjacent travel lanes by an island, even if the adjacent lanes at the intersection are controlled by a highway traffic control signal or by a STOP sign.

D. At an intersection where a special problem exists and where engineering judgment indicates the problem to be susceptible to correction by the use of the YIELD sign.

E. Facing the entering roadway for a merge-type movement if engineering judgment indicates that control is needed because acceleration geometry and/or sight distance is not adequate for merging traffic operation.

Standard:

02 **A YIELD (R1-2) sign shall be used to assign right-of-way at the entrance to a roundabout. YIELD signs at roundabouts shall be used to control the approach roadways and shall not be used to control the circulatory roadway.**

03 **Other than for all of the approaches to a roundabout, YIELD signs shall not be placed on all of the approaches to an intersection.**

Section 2B.10 STOP Sign or YIELD Sign Placement

Standard:

01 **The STOP or YIELD sign shall be installed on the near side of the intersection on the right-hand side of the approach to which it applies. When the STOP or YIELD sign is installed at this required location and the sign visibility is restricted, a Stop Ahead sign (see Section 2C.36) shall be installed in advance of the STOP sign or a Yield Ahead sign (see Section 2C.36) shall be installed in advance of the YIELD sign.**

02 **The STOP or YIELD sign shall be located as close as practical to the intersection it regulates, while optimizing its visibility to the road user it is intended to regulate.**

02a YIELD signs shall not be erected upon the approaches to more than one of the intersecting streets. Refer to CVC 21356.

03 **STOP signs and YIELD signs shall not be mounted on the same post.**

04 **No items other than inventory stickers, sign installation dates, and bar codes shall be affixed to the fronts of STOP or YIELD signs, and the placement of these items shall be in the border of the sign.**

05 **No items other than official traffic control signs, inventory stickers, sign installation dates, anti-vandalism stickers, and bar codes shall be mounted on the backs of STOP or YIELD signs.**

06 **No items other than retroreflective strips (see Section 2A.21) or official traffic control signs shall be mounted on the fronts or backs of STOP or YIELD signs supports.**

APPENDIX B

SWITRS COLLISION HISTORY

CITY OF INDIAN WELLS
INTERSECTION OF RANCHO PALMERAS DRIVE AND PALM SHADOW DRIVE
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.

NO COLLISIONS REPORTED.

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

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

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
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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Rancho Palmeras Dr & Palm Shadow Dr

Day: Tuesday
Date: 3/11/2025

Highest 8 Hours per Side-Street Perspective.

City: Indian Wells
Project #: CA25_030013_007

DAILY TOTALS	NB	SB	EB	WB	Total
	436	537	88	0	1,061

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00	2		2		0				4		12:00	11		16		2				29	
0:15	0		0		0				0		12:15	10		10		4				24	
0:30	0		0		0				0		12:30	10		6		2				18	
0:45	0	2	0	2	0				0	4	12:45	10	41	13	45	3	11			26	97
1:00	0		1		0				1		13:00	8		16		3				27	
1:15	0		0		0				0		13:15	12		7		3				22	
1:30	0		0		0				0		13:30	13		13		3				29	
1:45	0		0	1	0				0	1	13:45	7	40	10	46	2	11			19	97
2:00	0		0		0				0		14:00	11		11		2				24	
2:15	0		0		0				0		14:15	3		5		2				10	
2:30	0		0		0				0		14:30	7		10		3				20	
2:45	0		0		0				0		14:45	15	36	6	32	0	7			21	75
3:00	0		0		0				0		15:00	9		12		1				22	
3:15	0		0		0				0		15:15	11		8		4				23	
3:30	0		0		0				0		15:30	12		7		1				20	
3:45	0		1	1	0				1	1	15:45	9	41	6	33	0	6			15	80
4:00	1		1		0				2		16:00	5		10		0				15	
4:15	0		0		0				0		16:15	8		8		4				20	
4:30	1		2		0				3		16:30	9		5		2				16	
4:45	0	2	0	3	0				0	5	16:45	3	25	8	31	1	7			12	63
5:00	0		0		0				0		17:00	7		13		2				22	
5:15	2		1		1				4		17:15	4		9		3				16	
5:30	4		0		0				4		17:30	3		15		0				18	
5:45	0	6	0	1	1	2			1	9	17:45	3	17	8	45	1	6			12	68
6:00	4		2		0				6		18:00	7		9		2				18	
6:15	0		0		0				0		18:15	11		3		0				14	
6:30	1		2		0				3		18:30	6		8		0				14	
6:45	4	9	9	13	0				13	22	18:45	0	24	6	26	1	3			7	53
7:00	7		11		2				20		19:00	4		5		0				9	
7:15	1		4		1				6		19:15	1		4		0				5	
7:30	5		4		0				9		19:30	2		5		0				7	
7:45	5	18	8	27	0	3			13	48	19:45	7	14	6	20	2	2			15	36
8:00	2		14		1				17		20:00	2		2		0				4	
8:15	5		16		4				25		20:15	0		5		0				5	
8:30	11		14		1				26		20:30	5		6		0				11	
8:45	5	23	7	51	0	6			12	80	20:45	0	7	2	15	0				2	22
9:00	7		15		3				25		21:00	1		3		0				4	
9:15	8		7		1				16		21:15	0		3		0				3	
9:30	7		8		2				17		21:30	2		0		0				2	
9:45	10	32	10	40	3	9			23	81	21:45	4	7	5	11	1	1			10	19
10:00	13		6		2				21		22:00	0		0		0				0	
10:15	11		9		1				21		22:15	1		1		0				2	
10:30	8		16		1				25		22:30	1		1		0				2	
10:45	10	42	13	44	3	7			26	93	22:45	1	3	1	3	0				2	6
11:00	11		10		2				23		23:00	0		0		0				0	
11:15	13		11		2				26		23:15	0		1		0				1	
11:30	13		11		3				27		23:30	0		2		0				2	
11:45	10	47	12	44	0	7			22	98	23:45	0		0	3	0				0	3
TOTALS		181		227		34				442	TOTALS		255		310		54				619
SPLIT %		41.0%		51.4%		7.7%				41.7%	SPLIT %		41.2%		50.1%		8.7%				58.3%

DAILY TOTALS	NB	SB	EB	WB	Total
	436	537	88	0	1,061

AM Peak Hour	10:45	7:45	10:45		11:15	PM Peak Hour	14:45	12:45	12:15		12:45
AM Pk Volume	47	52	10		104	PM Pk Volume	47	49	12		104
Pk Hr Factor	0.904	0.813	0.833		0.897	Pk Hr Factor	0.783	0.766	0.750		0.897
7 - 9 Volume	41	78	9	0	128	4 - 6 Volume	42	76	13	0	131
7 - 9 Peak Hour	7:45	7:45	7:45		7:45	4 - 6 Peak Hour	16:15	16:45	16:15		16:15
7 - 9 Pk Volume	23	52	6	0	81	4 - 6 Pk Volume	27	45	9	0	70
Pk Hr Factor	0.523	0.813	0.375	0.000	0.779	Pk Hr Factor	0.750	0.750	0.563	0.000	0.795

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 - 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.)

*** Posted speed limit, off-peak 85th-percentile speed prior to work starting, or other anticipated operating speed in mph.

Table 6C-2. Stopping Sight Distance as a Function of Speed on Level Roads. (Used as suggested longitudinal buffer space length or location for flagger station)

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 in mph.

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

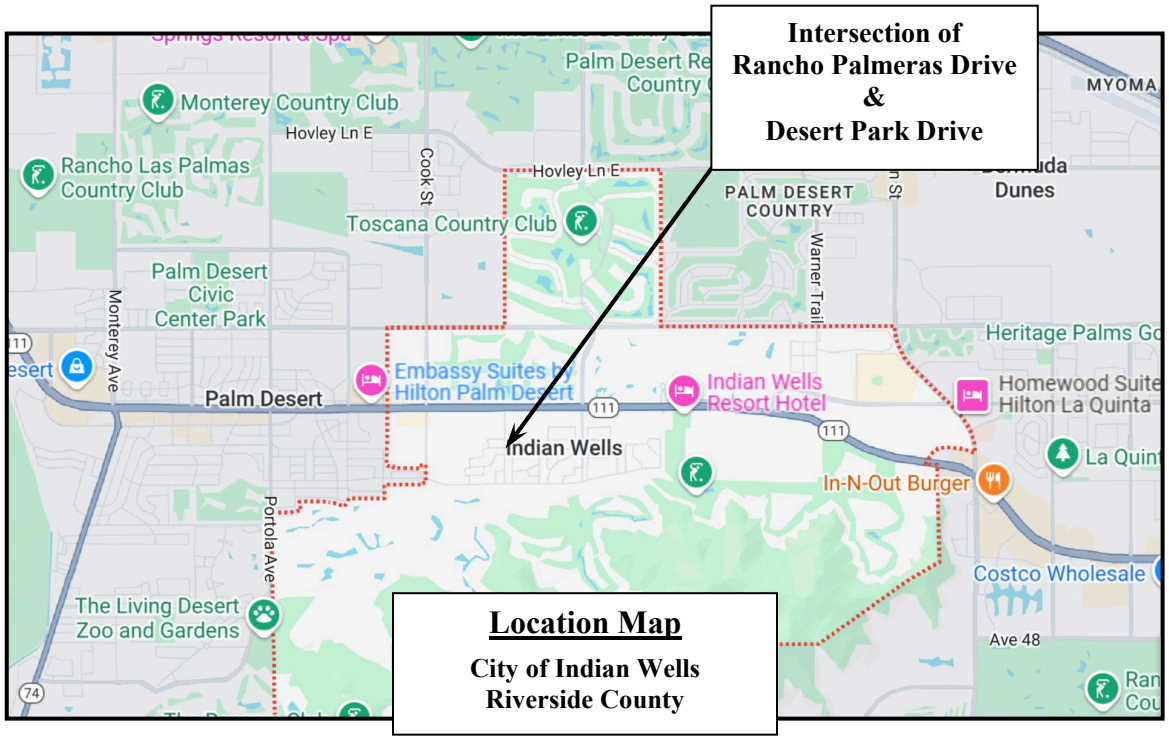
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF RANCHO PALMERAS DRIVE AND DESERT PARK DRIVE IN THE CITY OF INDIAN WELLS, CA MARCH 11, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Rancho Palmeras Drive and Desert Park Drive. This analysis was completed in order to verify if a three-way stop sign installation is warranted and recommended based on meeting standard guidelines.

The location is a 3-way intersection with Rancho Palmeras Drive running in the north-south directions and Desert Park Drive in the east-west directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a one-way STOP sign control installed on Desert Park Drive.



BACKGROUND

At the subject intersection, **Rancho Palmeras Drive** is classified as a north-south collector roadway with primarily single-family residential properties on both sides of the street. The roadway is approximately 56 feet wide curb-to-curb. The 2-lane roadway provides for one lane of traffic in each direction that are separated by a painted double-yellow centerline. There are no marked crosswalks across Rancho Palmeras Drive at or near the intersection. The roadway has curb and gutter improvements on both sides of the street. Rancho Palmeras Drive has a posted speed limit of 35 MPH, and on-street parking is allowed on both sides of the street. Currently, there are no STOP signs or other types of traffic control on Rancho Palmeras Drive (i.e., uncontrolled) at its intersection with Desert Park Drive.

See Exhibit 1 (next page) for photo images of Rancho Palmeras Drive.

Desert Park Drive is classified as an east-west local roadway leading to single-family residential properties on both sides of the street. The roadway measures approximately 36 feet wide curb-to-curb. The 2-lane roadway provides for one lane of traffic in each direction which are not separated by any centerline striping. There are no marked crosswalks across Desert Park Drive. The roadway has curb and gutter improvements on both sides of the street. Desert Park Drive has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there is one STOP sign posted, as well as a STOP pavement marking and limit line, on the Desert Park Drive approach to the intersection with Rancho Palmeras Drive.

See Exhibit 2 (following page) for photo image of Desert Park Drive.

EXHIBIT 1



RANCHO PALMERAS DRIVE (*Looking Northbound*) at DESERT PARK DRIVE



RANCHO PALMERAS DRIVE (*Looking Southbound*) at DESERT PARK DRIVE

EXHIBIT 2



DESERT PARK DRIVE (*Looking Eastbound*) at RANCHO PALMERAS DRIVE

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 3-way (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.

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.

MULTIWAY 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. Such crashes include right-turn and left-turn collisions, as well as right-angle collisions (i.e., broadside, or head-on) and pedestrian-vehicle collisions. Other types categorized as 'sideswipe', 'rear-end', and 'hit object' collisions are generally not considered susceptible to correction, unless further review indicates otherwise. The latest available collision history was gathered by HCI from the California Highway Patrol (CHP) Statewide Integrated Traffic Records System website (*i-SWITRS*), which is where local jurisdictions such as cities report their collisions.

Collision History (continued)

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 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**
Rancho Palmeras at Desert Park		*None reported*		*None reported*		*None reported*		*None reported*

Notes: Information above is derived per the latest 5-year intersection collision database report gathered from CHP-SWITRS (*i-SWITRS website*).

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

As shown, there have been zero (0) reported collisions at or near this intersection over the past (5) years of available SWITRS collision data. 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. ***The prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, January 28, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Rancho Palmeras Drive is 849 vehicles per day with the highest AM peak-hour volume having 74 vehicles, and 77 vehicles in the PM peak-hour. The bi-directional ADT count for Desert Park Drive is 106 vehicles with the highest AM peak-hour volume having 17 vehicles, and 8 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The traffic volume data collected for this intersection is included in Appendix C.***

Traffic Volumes (continued)

TABLE 2
HIGHEST 24-HOUR INTERSECTION APPROACH VEHICLE COUNTS

Street	Direction	ADT Volume	Directional Split	Highest Hourly Volume
Rancho Palmeras Drive	Northbound	378	45%	40 (12 - 1 PM)
	Southbound	471	55%	42 (8 – 9 AM)
Desert Park Drive	Eastbound	106	100%	17 (10 - 11 AM)

Rancho Palmeras Drive is considered the 'through' or 'major' street at this residential T-intersection since it carries higher volumes from both approaches, and drivers are not required to slow down, or even stop, before proceeding straight through the intersection. In comparison, Desert Park Drive is considered the 'minor' street as drivers are required to stop at Rancho Palmeras Drive and look both ways before proceeding to make a left-turn or right-turn. It is typically expected that the traffic volumes on the minor street are significantly less than those on the major street. As can be seen from the table above, this is the case, as the minor street carries approximately 11% of the entire vehicular traffic entering the intersection (Rancho Palmeras Drive carries 89%).

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 sign installation are reduced to 70%. As mentioned, the posted speed limit on Rancho Palmeras Drive is 35 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at/below this posted speed near the intersection, and were considered typical of what may be expected for a two-lane collector type roadway. As the speed limit is less than the 40+ MPH limit required to reduce traffic volumes, the 70% minimum volumes for a multi-way stop sign analysis are <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the hourly vehicle traffic counts shown in Table 2 above are given for the highest one 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 must also be mentioned that the average hourly minimum volumes required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for 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 collected 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
RANCHO PALMERAS DRIVE AT DESERT PARK DRIVE

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,	***and***	**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,	***but***	**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.
Results:		**Results:**		**Results:**
No, average (61) vehicles per hour for highest 8 hours		**No, average (10) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 20% of required hourly traffic volume		**Meets 5% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*20% major street / 5% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

Driver sight distance was measured from the side-street approach, as eastbound traffic on Desert Park Drive is required to stop, before making a left-turn or right-turn onto Rancho Palmeras Drive. The measured sight distance was derived from the stopping sight distance guidelines found in the California MUTCD ***(see Appendix D)***. In this reference, a 35 MPH roadway speed recommends a minimum Stopping Sight Distance of 250 feet. However, it is likely that the 85th percentile speeds typically exceed the 35 MPH posted speed limit. Therefore, a 40 MPH speed limit was used as a more conservative measure, which has a minimum sight distance of 305 feet.

This 305-foot distance was used when looking towards approaching, uncontrolled traffic along Rancho Palmeras Drive. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on Desert Park Drive at the intersection looking towards the oncoming lanes of cross-traffic on Rancho Palmeras Drive. An orange cone was placed at this distance and a photograph was taken from a stopped driver's perspective (i.e., approx. 3.5 feet in height).

(***See sight distance photos in Exhibit 3 on the following page***).

As shown on Exhibit 3, a clear line of sight was achieved when looking from the side-street approach.

EXHIBIT 3



Eastbound DESERT PARK DRIVE (*Looking North*) at RANCHO PALMERAS DRIVE



Eastbound DESERT PARK DRIVE (*Looking South*) at RANCHO PALMERAS DRIVE

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 (i.e., Rancho Palmeras Drive). 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 most recent collision history at the intersection resulted in zero (0) SWITRS-reported collisions during the last five 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approach was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. If the California MUTCD criteria are not met, the location is typically not recommended for installation of a multi-way stop.

However, engineering judgment should always be included in any decision regarding traffic safety improvements. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 305 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a medium activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Ranchero Palmeras Drive at Desert Park Drive is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (3-way) stop sign installation is not recommended for the intersection of Rancho Palmeras Drive and Desert Park Drive. There are no other recommendations for the intersection at this time.

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).

Option:

10b YIELD or STOP signs may be used at a channelized turn lane if it is separated from the adjacent travel lanes moving in same direction by an island and the channelized turn lane is not controlled by a traffic control signal.

Standard:

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 Caltrans 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 Caltrans. Refer to CVC 21353.

Support:

17 Caltrans 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.

Section 2B.08 YIELD Sign (R1-2)

Standard:

01 **The YIELD (R1-2) sign (see Figure 2B-1) shall be a downward-pointing equilateral triangle with a wide red border and the legend YIELD in red on a white background.**

Support:

02 The YIELD sign assigns right-of-way to traffic on certain approaches to an intersection. Vehicles controlled by a YIELD sign need to slow down to a speed that is reasonable for the existing conditions or stop when necessary to avoid interfering with conflicting traffic.

Section 2B.09 YIELD Sign Applications

Option:

01 YIELD signs may be installed:

A. On the approaches to a through street or highway where conditions are such that a full stop is not always required.

B. At the second crossroad of a divided highway, where the median width at the intersection is 30 feet or greater. In this case, a STOP or YIELD sign may be installed at the entrance to the first roadway of a divided highway, and a YIELD sign may be installed at the entrance to the second roadway.

C. For a channelized turn lane that is separated from the adjacent travel lanes by an island, even if the adjacent lanes at the intersection are controlled by a highway traffic control signal or by a STOP sign.

D. At an intersection where a special problem exists and where engineering judgment indicates the problem to be susceptible to correction by the use of the YIELD sign.

E. Facing the entering roadway for a merge-type movement if engineering judgment indicates that control is needed because acceleration geometry and/or sight distance is not adequate for merging traffic operation.

Standard:

02 **A YIELD (R1-2) sign shall be used to assign right-of-way at the entrance to a roundabout. YIELD signs at roundabouts shall be used to control the approach roadways and shall not be used to control the circulatory roadway.**

03 **Other than for all of the approaches to a roundabout, YIELD signs shall not be placed on all of the approaches to an intersection.**

Section 2B.10 STOP Sign or YIELD Sign Placement

Standard:

01 **The STOP or YIELD sign shall be installed on the near side of the intersection on the right-hand side of the approach to which it applies. When the STOP or YIELD sign is installed at this required location and the sign visibility is restricted, a Stop Ahead sign (see Section 2C.36) shall be installed in advance of the STOP sign or a Yield Ahead sign (see Section 2C.36) shall be installed in advance of the YIELD sign.**

02 **The STOP or YIELD sign shall be located as close as practical to the intersection it regulates, while optimizing its visibility to the road user it is intended to regulate.**

02a YIELD signs shall not be erected upon the approaches to more than one of the intersecting streets. Refer to CVC 21356.

03 **STOP signs and YIELD signs shall not be mounted on the same post.**

04 **No items other than inventory stickers, sign installation dates, and bar codes shall be affixed to the fronts of STOP or YIELD signs, and the placement of these items shall be in the border of the sign.**

05 **No items other than official traffic control signs, inventory stickers, sign installation dates, anti-vandalism stickers, and bar codes shall be mounted on the backs of STOP or YIELD signs.**

06 **No items other than retroreflective strips (see Section 2A.21) or official traffic control signs shall be mounted on the fronts or backs of STOP or YIELD signs supports.**

APPENDIX B

SWITRS COLLISION HISTORY

CITY OF INDIAN WELLS
INTERSECTION OF RANCHO PALMERAS DRIVE AND DESERT PARK DRIVE
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.

NO COLLISIONS REPORTED.

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

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

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
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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Rancho Palmeras Dr & Desert Park Dr

Day: Tuesday
Date: 3/11/2025

Highest 8 Hours per Side-Street Perspective.

City: Indian Wells
Project #: CA25_030013_012

DAILY TOTALS	NB	SB	EB	WB	Total
	378	471	106	0	955

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00	1		2		1				4		12:00	12		13		2				27	
0:15	0		0		0				0		12:15	8		9		4				21	
0:30	0		0		0				0		12:30	11		4		0				15	
0:45	0	1	0	2	0	1			0	4	12:45	9	40	11	37	0	6			20	83
1:00	0		1		0				1		13:00	8		13		1				22	
1:15	0		0		0				0		13:15	12		4		0				16	
1:30	0		0		0				0		13:30	10		15		5				30	
1:45	0		0	1	0				0	1	13:45	6	36	6	38	1	7			13	81
2:00	0		0		0				0		14:00	7		11		4				22	
2:15	0		0		0				0		14:15	3		5		3				11	
2:30	0		0		0				0		14:30	7		9		0				16	
2:45	0		0		0				0		14:45	14	31	5	30	1	8			20	69
3:00	0		0		0				0		15:00	7		12		1				20	
3:15	0		0		0				0		15:15	9		8		2				19	
3:30	0		0		0				0		15:30	13		7		0				20	
3:45	0		1	1	0				1	1	15:45	9	38	6	33	1	4			16	75
4:00	1		1		0				2		16:00	6		8		0				14	
4:15	0		0		0				0		16:15	8		6		3				17	
4:30	1		2		0				3		16:30	6		5		3				14	
4:45	0	2	0	3	0				0	5	16:45	3	23	8	27	1	7			12	57
5:00	0		0		0				0		17:00	6		10		1				17	
5:15	2		0		0				2		17:15	3		11		1				15	
5:30	4		0		1				5		17:30	4		15		1				20	
5:45	0	6	0		0	1			0	7	17:45	3	16	7	43	2	5			12	64
6:00	3		2		1				6		18:00	9		7		0				16	
6:15	0		0		1				1		18:15	8		1		2				11	
6:30	1		1		1				3		18:30	3		7		3				13	
6:45	3	7	8	11	1	4			12	22	18:45	0	20	6	21	0	5			6	46
7:00	3		8		4				15		19:00	4		4		0				8	
7:15	1		2		0				3		19:15	1		4		0				5	
7:30	3		4		2				9		19:30	2		5		0				7	
7:45	4	11	7	21	2	8			13	40	19:45	6	13	5	18	1	1			12	32
8:00	2		12		0				14		20:00	2		2		0				4	
8:15	3		13		4				20		20:15	0		5		1				6	
8:30	9		12		4				25		20:30	5		5		0				10	
8:45	5	19	5	42	0	8			10	69	20:45	0	7	2	14	0	1			2	22
9:00	6		12		1				19		21:00	1		3		0				4	
9:15	9		6		1				16		21:15	0		3		0				3	
9:30	6		8		3				17		21:30	2		0		0				2	
9:45	8	29	10	36	1	6			19	71	21:45	3	6	4	10	1	1			8	17
10:00	8		7		5				20		22:00	0		0		0				0	
10:15	9		8		4				21		22:15	1		1		0				2	
10:30	5		16		5				26		22:30	1		1		0				2	
10:45	10	32	10	41	3	17			23	90	22:45	1	3	1	3	0				2	6
11:00	10		9		2				21		23:00	0		0		0				0	
11:15	11		7		5				23		23:15	0		1		0				1	
11:30	8		8		6				22		23:30	0		2		0				2	
11:45	9	38	12	36	2	15			23	89	23:45	0		0	3	1	1			1	4
TOTALS		145		194		60				399	TOTALS		233		277		46				556
SPLIT %		36.3%		48.6%		15.0%				41.8%	SPLIT %		41.9%		49.8%		8.3%				58.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	378	471	106	0	955

AM Peak Hour	11:15	7:45	10:00		11:15	PM Peak Hour	14:45	16:45	13:30		12:45
AM Pk Volume	40	44	17		95	PM Pk Volume	43	44	13		88
Pk Hr Factor	0.833	0.846	0.850		0.880	Pk Hr Factor	0.768	0.733	0.650		0.733
7 - 9 Volume	30	63	16	0	109	4 - 6 Volume	39	70	12	0	121
7 - 9 Peak Hour	8:00	7:45	7:45		7:45	4 - 6 Peak Hour	16:00	16:45	16:15		16:45
7 - 9 Pk Volume	19	44	10	0	72	4 - 6 Pk Volume	23	44	8	0	64
Pk Hr Factor	0.528	0.846	0.625	0.000	0.720	Pk Hr Factor	0.719	0.733	0.667	0.000	0.800

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 - 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.)

*** Posted speed limit, off-peak 85th-percentile speed prior to work starting, or other anticipated operating speed in mph.

Table 6C-2. Stopping Sight Distance as a Function of Speed on Level Roads. (Used as suggested longitudinal buffer space length or location for flagger station)

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 in mph.

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

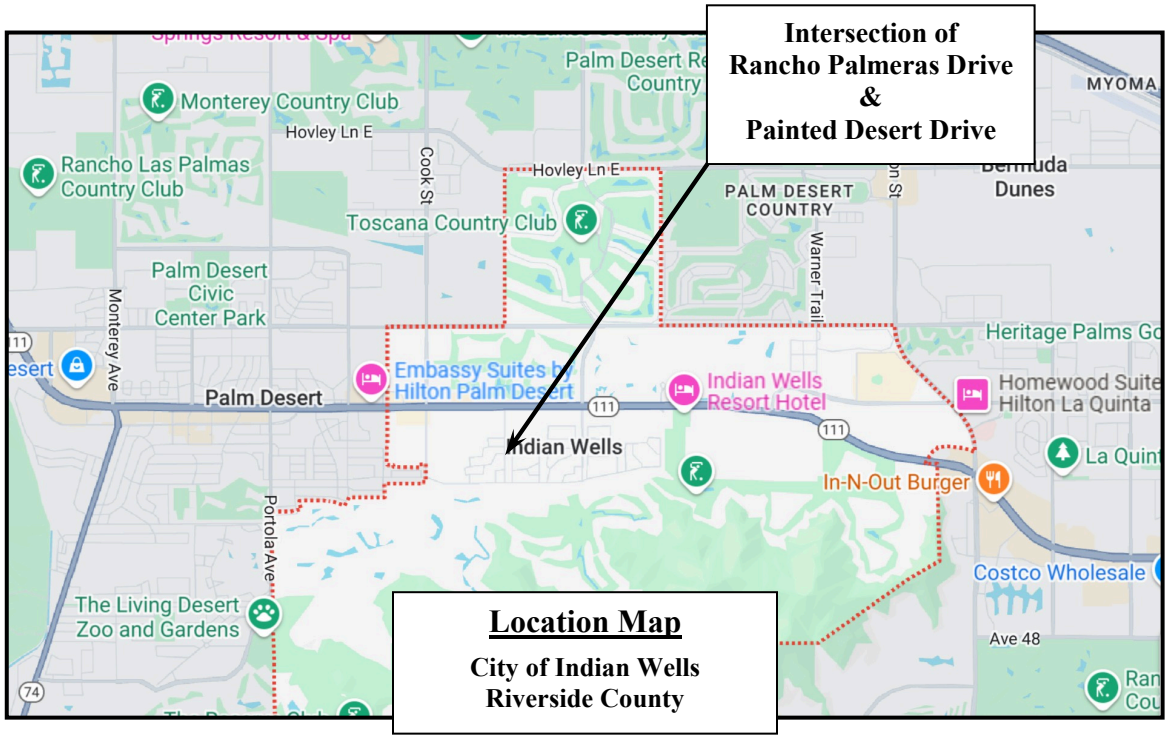
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF RANCHO PALMERAS DRIVE AND PAINTED DESERT DRIVE IN THE CITY OF INDIAN WELLS, CA MARCH 12, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Rancho Palmeras Drive and Painted Desert Drive. This analysis was completed in order to verify if a four-way stop sign installation is warranted and recommended based on meeting standard guidelines.

The location is a 4-way intersection with Rancho Palmeras Drive running in the north-south directions and Painted Desert Drive in the east-west directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a two-way STOP sign control installed on Painted Desert Drive.



BACKGROUND

At the subject intersection, **Rancho Palmeras Drive** is classified as a north-south collector roadway with primarily single-family residential properties on both sides of the street. The roadway is approximately 56 feet wide curb-to-curb. The 2-lane roadway provides for one lane of traffic in each direction that are separated by a southbound left-turn lane and a painted double-yellow centerline. There are no marked crosswalks across Rancho Palmeras Drive at or near the intersection. The roadway has curb and gutter improvements on both sides of the street. Rancho Palmeras Drive has a posted speed limit of 35 MPH, and on-street parking is allowed on both sides of the street. Currently, there are no STOP signs or other types of traffic control on Rancho Palmeras Drive (i.e., uncontrolled) at its intersection with Painted Desert Drive.

See Exhibit 1 (next page) for photo images of Rancho Palmeras Drive.

Painted Desert Drive is classified as an east-west local roadway leading to single-family residential properties on both sides of the street. The roadway measures approximately 36 feet wide curb-to-curb. The 2-lane roadway provides for one lane of traffic in each direction which are not separated by any centerline striping. There are no marked crosswalks across Painted Desert Drive. The roadway has curb and gutter improvements on both sides of the street. Painted Desert Drive has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there are two STOP signs posted on the Painted Desert Drive approaches to the intersection with Rancho Palmeras Drive.

See Exhibit 2 (following page) for photo images of Painted Desert Drive.

EXHIBIT 1



RANCHO PALMERAS DRIVE (*Looking Northbound*) at PAINTED DESERT DRIVE



RANCHO PALMERAS DRIVE (*Looking Southbound*) at PAINTED DESERT DRIVE

EXHIBIT 2



PAINTED DESERT DRIVE (*Looking Eastbound*) at RANCHO PALMERAS DRIVE



PAINTED DESERT DRIVE (*Looking Westbound*) at RANCHO PALMERAS DRIVE

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 4-way (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.

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.

MULTIWAY 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. Such crashes include right-turn and left-turn collisions, as well as right-angle collisions (i.e., broadside, or head-on) and pedestrian-vehicle collisions. Other types categorized as 'sideswipe', 'rear-end', and 'hit object' collisions are generally not considered susceptible to correction, unless further review indicates otherwise. The latest available collision history was gathered by HCI from the California Highway Patrol (CHP) Statewide Integrated Traffic Records System website (*i-SWITRS*), which is where local jurisdictions such as cities report their collisions.

Collision History (continued)

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 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**
Rancho Palmeras at Painted Desert		*None reported*		*None reported*		*None reported*		*None reported*

Notes: Information above is derived per the latest 5-year intersection collision database report gathered from CHP-SWITRS (*i-SWITRS website*).

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

As shown, there have been zero (0) reported collisions at or near this intersection over the past (5) years of available SWITRS collision data. 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. ***The prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, March 11, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Rancho Palmeras Drive is 656 vehicles per day with the highest AM peak-hour volume having 58 vehicles, and 58 vehicles in the PM peak-hour. The bi-directional ADT count for Painted Desert Drive is 192 vehicles with the highest AM peak-hour volume having 28 vehicles, and 21 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The traffic volume data collected for this intersection is included in Appendix C.***

Traffic Volumes (continued)

TABLE 2
HIGHEST 24-HOUR INTERSECTION APPROACH VEHICLE COUNTS

Street	Direction	ADT Volume	Directional Split	Highest Hourly Volume
Rancho Palmeras Drive	Northbound	243	37%	28 (12 - 1 PM)
	Southbound	413	63%	42 (8 - 9 AM)
Painted Desert Drive	Eastbound	73	38%	11 (11 AM - 12 PM)
	Westbound	119	62%	17 (11 AM - 12 PM)

Rancho Palmeras Drive is considered the 'through' or 'major' street at this residential intersection since it carries higher volumes from both approaches, and drivers are not required to slow down, or even stop, before proceeding straight through the intersection. In comparison, Painted Desert Drive is considered the 'minor' street as drivers on this street are required to stop at Rancho Palmeras Drive and look both ways before proceeding to make a left-turn or right-turn. It is typically expected that the minor street traffic volumes are significantly less than those on the major street. As can be seen from the table above, this is the case, as the minor street carries approximately 23% of the entire vehicular traffic entering the intersection (Rancho Palmeras Drive carries 77%).

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 sign installation are reduced to 70%. As mentioned, the posted speed limit on Rancho Palmeras Drive is 35 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at/below this posted speed near the intersection, and were considered typical of what may be expected for a two-lane collector type roadway. As the speed limit is less than the 40+ MPH limit required to reduce traffic volumes, the 70% minimum volumes for a multi-way stop sign analysis are <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the hourly vehicle traffic counts shown in Table 2 above are given for the highest one 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 must also be mentioned that the average hourly minimum volumes required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for 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 collected 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
RANCHO PALMERAS DRIVE AT PAINTED DESERT DRIVE

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,	***and***	**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,	***but***	**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.
Results:		**Results:**		**Results:**
No, average (49) vehicles per hour for highest 8 hours		**No, average (18) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 16% of required hourly traffic volume		**Meets 9% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*16% major street / 9% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

Driver sight distance was measured from the side-street approach, as eastbound and westbound traffic on Painted Desert Drive is required to stop, before making a left-turn or right-turn onto Rancho Palmeras Drive. The measured sight distance was derived from the stopping sight distance guidelines found in the California MUTCD ***(see Appendix D)***. In this reference, a 35 MPH roadway speed recommends a minimum Stopping Sight Distance of 250 feet. However, it is likely that the 85th percentile speeds typically exceed the 35 MPH posted speed limit. Therefore, a 40 MPH speed limit was used as a more conservative measure, which has a minimum sight distance of 305 feet.

This 305-foot distance was used when looking towards approaching, uncontrolled traffic along Rancho Palmeras Drive. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on Painted Desert Drive at the intersection looking towards the oncoming lanes of cross-traffic on Rancho Palmeras Drive. An orange cone was placed at this distance and a photograph was taken from a stopped driver's perspective (i.e., approx. 3.5 feet in height).

(***See sight distance photos in Exhibits 3 and 4 on the following pages***).

As shown on Exhibits 3 and 4, a clear line of sight was achieved when looking from both side-street approaches.

EXHIBIT 3



Eastbound PAINTED DESERT DRIVE (*Looking North*) at RANCHO PALMERAS DRIVE



Eastbound PAINTED DESERT DRIVE (*Looking South*) at RANCHO PALMERAS DRIVE

EXHIBIT 4



Westbound PAINTED DESERT DRIVE (*Looking North*) at RANCHO PALMERAS DRIVE



Westbound PAINTED DESERT DRIVE (*Looking South*) at RANCHO PALMERAS DRIVE

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 (i.e., Rancho Palmeras Drive). 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 most recent collision history at the intersection resulted in zero (0) SWITRS-reported collisions during the last five 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approach was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. If the California MUTCD criteria are not met, the location is typically not recommended for installation of a multi-way stop.

However, engineering judgment should always be included in any decision regarding traffic safety improvements. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 305 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a medium activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Ranchero Palmeras Drive at Painted Desert Drive is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (4-way) stop sign installation is not recommended for the intersection of Rancho Palmeras Drive and Painted Desert Drive. There are no other recommendations for the intersection at this time.

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).

Option:

10b YIELD or STOP signs may be used at a channelized turn lane if it is separated from the adjacent travel lanes moving in same direction by an island and the channelized turn lane is not controlled by a traffic control signal.

Standard:

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 Caltrans 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 Caltrans. Refer to CVC 21353.

Support:

17 Caltrans 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.

Section 2B.08 YIELD Sign (R1-2)

Standard:

01 **The YIELD (R1-2) sign (see Figure 2B-1) shall be a downward-pointing equilateral triangle with a wide red border and the legend YIELD in red on a white background.**

Support:

02 The YIELD sign assigns right-of-way to traffic on certain approaches to an intersection. Vehicles controlled by a YIELD sign need to slow down to a speed that is reasonable for the existing conditions or stop when necessary to avoid interfering with conflicting traffic.

Section 2B.09 YIELD Sign Applications

Option:

01 YIELD signs may be installed:

A. On the approaches to a through street or highway where conditions are such that a full stop is not always required.

B. At the second crossroad of a divided highway, where the median width at the intersection is 30 feet or greater. In this case, a STOP or YIELD sign may be installed at the entrance to the first roadway of a divided highway, and a YIELD sign may be installed at the entrance to the second roadway.

C. For a channelized turn lane that is separated from the adjacent travel lanes by an island, even if the adjacent lanes at the intersection are controlled by a highway traffic control signal or by a STOP sign.

D. At an intersection where a special problem exists and where engineering judgment indicates the problem to be susceptible to correction by the use of the YIELD sign.

E. Facing the entering roadway for a merge-type movement if engineering judgment indicates that control is needed because acceleration geometry and/or sight distance is not adequate for merging traffic operation.

Standard:

02 **A YIELD (R1-2) sign shall be used to assign right-of-way at the entrance to a roundabout. YIELD signs at roundabouts shall be used to control the approach roadways and shall not be used to control the circulatory roadway.**

03 **Other than for all of the approaches to a roundabout, YIELD signs shall not be placed on all of the approaches to an intersection.**

Section 2B.10 STOP Sign or YIELD Sign Placement

Standard:

01 **The STOP or YIELD sign shall be installed on the near side of the intersection on the right-hand side of the approach to which it applies. When the STOP or YIELD sign is installed at this required location and the sign visibility is restricted, a Stop Ahead sign (see Section 2C.36) shall be installed in advance of the STOP sign or a Yield Ahead sign (see Section 2C.36) shall be installed in advance of the YIELD sign.**

02 **The STOP or YIELD sign shall be located as close as practical to the intersection it regulates, while optimizing its visibility to the road user it is intended to regulate.**

02a YIELD signs shall not be erected upon the approaches to more than one of the intersecting streets. Refer to CVC 21356.

03 **STOP signs and YIELD signs shall not be mounted on the same post.**

04 **No items other than inventory stickers, sign installation dates, and bar codes shall be affixed to the fronts of STOP or YIELD signs, and the placement of these items shall be in the border of the sign.**

05 **No items other than official traffic control signs, inventory stickers, sign installation dates, anti-vandalism stickers, and bar codes shall be mounted on the backs of STOP or YIELD signs.**

06 **No items other than retroreflective strips (see Section 2A.21) or official traffic control signs shall be mounted on the fronts or backs of STOP or YIELD signs supports.**

APPENDIX B

SWITRS COLLISION HISTORY

CITY OF INDIAN WELLS
INTERSECTION OF RANCHO PALMERAS DRIVE AND PAINTED DESERT DRIVE
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.

NO COLLISIONS REPORTED.

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

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

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
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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Rancho Palmeras Dr & Painted Desert Dr

Day: Tuesday
Date: 3/11/2025

Highest 8 Hours per Side-Street Perspecctive.

City: Indian Wells
Project #: CA25_030013_014

DAILY TOTALS	NB	SB	EB	WB	Total
	243	413	73	119	848

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00	1		1		0		0		2		12:00	8		11		3		4		26	
0:15	0		0		0		0		0		12:15	8		6		3		3		20	
0:30	0		0		0		0		0		12:30	8		4		0		4		16	
0:45	0	1	0	1	0		0		0	2	12:45	4	28	8	29	0	6	4	15	16	78
1:00	0		1		0		0		1		13:00	6		12		2		0		20	
1:15	0		0		0		0		0		13:15	7		3		3		4		17	
1:30	0		0		0		0		0		13:30	8		13		0		3		24	
1:45	0		0	1	0		0		0	1	13:45	4	25	5	33	1	6	1	8	11	72
2:00	0		0		0		0		0		14:00	4		10		2		2		18	
2:15	0		0		0		0		0		14:15	2		8		1		1		12	
2:30	0		0		0		0		0		14:30	3		4		3		4		14	
2:45	0		0		0		0		0		14:45	7	16	5	27	4	10	3	10	19	63
3:00	0		0		0		0		0		15:00	2		11		1		5		19	
3:15	0		0		0		0		0		15:15	6		5		1		3		15	
3:30	0		0		0		0		0		15:30	9		7		2		3		21	
3:45	0		1	1	0		0		1	1	15:45	6	23	2	25	0	4	1	12	9	64
4:00	1		1		0		0		2		16:00	6		4		0		0		10	
4:15	0		0		0		0		0		16:15	7		6		0		1		14	
4:30	1		2		0		0		3		16:30	3		6		0		3		12	
4:45	0	2	0	3	0		0		0	5	16:45	3	19	8	24	0		1	5	12	48
5:00	0		0		0		0		0		17:00	5		9		2		1		17	
5:15	2		0		0		0		2		17:15	2		8		1		2		13	
5:30	2		1		1		2		6		17:30	2		14		2		2		20	
5:45	0	4	0	1	0	1	1	3	1	9	17:45	3	12	8	39	3	8	1	6	15	65
6:00	0		2		2		0		4		18:00	4		5		1		4		14	
6:15	0		1		0		0		1		18:15	4		1		3		2		10	
6:30	1		1		0		0		2		18:30	2		5		1		1		9	
6:45	2	3	6	10	0	2	1	1	9	16	18:45	0	10	6	17	0	5	0	7	6	39
7:00	1		8		2		2		13		19:00	1		4		1		2		8	
7:15	0		2		0		1		3		19:15	2		3		0		0		5	
7:30	1		4		0		1		6		19:30	1		5		1		0		7	
7:45	3	5	8	22	0	2	2	6	13	35	19:45	4	8	5	17	1	3	3	5	13	33
8:00	2		9		0		0		11		20:00	4		2		0		1		7	
8:15	4		12		0		1		17		20:15	1		4		0		0		5	
8:30	7		15		0		2		24		20:30	3		5		1		0		9	
8:45	3	16	6	42	1	1	2	5	12	64	20:45	0	8	1	12	1	2	0	1	2	23
9:00	6		8		0		0		14		21:00	1		2		0		0		3	
9:15	6		5		3		2		16		21:15	0		3		0		0		3	
9:30	3		5		1		2		11		21:30	1		0		0		0		1	
9:45	4	19	8	26	0	4	2	6	14	55	21:45	2	4	3	8	1	1	0		6	13
10:00	4		4		1		3		12		22:00	0		0		0		0		0	
10:15	6		6		1		2		15		22:15	1		1		0		0		2	
10:30	2		14		1		2		19		22:30	0		1		0		1		2	
10:45	4	16	10	34	4	7	3	10	21	67	22:45	0	1	1	3	0		1	2	2	6
11:00	8		6		1		2		17		23:00	0		0		0		0		0	
11:15	6		8		2		7		23		23:15	0		1		0		0		1	
11:30	3		9		2		5		19		23:30	0		2		0		0		2	
11:45	6	23	11	34	6	11	3	17	26	85	23:45	0		1	4	0		0		1	4
TOTALS		89		175		28		48		340	TOTALS		154		238		45		71		508
SPLIT %		26.2%		51.5%		8.2%		14.1%		40.1%	SPLIT %		30.3%		46.9%		8.9%		14.0%		59.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	243	413	73	119	848

AM Peak Hour	11:45	7:45	11:30	11:15	11:15	PM Peak Hour	12:00	16:45	14:00	12:00	12:00
AM Pk Volume	30	44	14	19	94	PM Pk Volume	28	39	10	15	78
Pk Hr Factor	0.938	0.733	0.583	0.679	0.904	Pk Hr Factor	0.875	0.696	0.625	0.938	0.750
7 - 9 Volume	21	64	3	11	99	4 - 6 Volume	31	63	8	11	113
7 - 9 Peak Hour	7:45	7:45	7:00	7:00	7:45	4 - 6 Peak Hour	16:00	16:45	17:00	16:30	17:00
7 - 9 Pk Volume	16	44	2	6	65	4 - 6 Pk Volume	19	39	8	7	65
Pk Hr Factor	0.571	0.733	0.250	0.750	0.677	Pk Hr Factor	0.679	0.696	0.667	0.583	0.813

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 - 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.)

*** Posted speed limit, off-peak 85th-percentile speed prior to work starting, or other anticipated operating speed in mph.

Table 6C-2. Stopping Sight Distance as a Function of Speed on Level Roads. (Used as suggested longitudinal buffer space length or location for flagger station)

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 in mph.

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

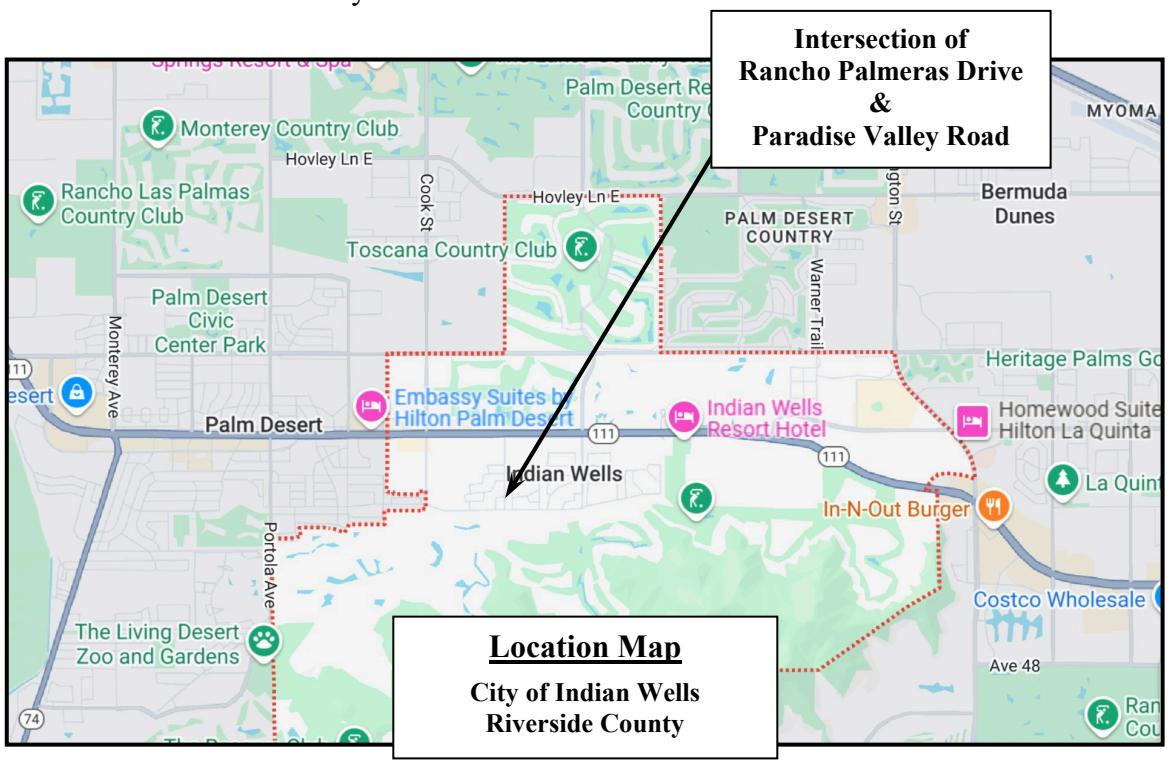
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF RANCHO PALMERAS DRIVE AND PARADISE VALLEY ROAD IN THE CITY OF INDIAN WELLS, CA MARCH 13, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Rancho Palmeras Drive and Paradise Valley Road. This analysis was completed in order to verify if a three-way stop sign installation is warranted and recommended based on meeting standard guidelines.

The location is a 3-way intersection with Rancho Palmeras Drive running in the north-south directions and Paradise Valley Road in the east-west directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a one-way STOP sign control installed on Paradise Valley Road.



BACKGROUND

At the subject intersection, **Rancho Palmeras Drive** is classified as a north-south collector roadway with primarily single-family residential properties on both sides of the street. The roadway is approximately 56 feet wide curb-to-curb. The 2-lane roadway provides for one lane of traffic in each direction that are separated by a painted double-yellow centerline. There are no marked crosswalks across Rancho Palmeras Drive at or near the intersection. The roadway has curb and gutter improvements on both sides of the street. Rancho Palmeras Drive has a posted speed limit of 35 MPH, and on-street parking is allowed on both sides of the street. Currently, there are no STOP signs or other types of traffic control on Rancho Palmeras Drive (i.e., uncontrolled) at its intersection with Paradise Valley Road.

See Exhibit 1 (next page) for photo images of Rancho Palmeras Drive.

Paradise Valley Road is classified as an east-west local roadway leading to single-family residential properties on both sides of the street. The roadway measures approximately 36 feet wide curb-to-curb. The 2-lane roadway provides for one lane of traffic in each direction which are not separated by any centerline striping. There are no marked crosswalks across Paradise Valley Road. The roadway has curb and gutter improvements on both sides of the street. Paradise Valley Road has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there is one STOP sign posted, as well as a STOP pavement marking and limit line, on the Paradise Valley Road approach to the intersection with Rancho Palmeras Drive.

See Exhibit 2 (following page) for a photo image of Paradise Valley Road.

EXHIBIT 1



RANCHO PALMERAS DRIVE (*Looking Northbound*) at PARADISE VALLEY ROAD



RANCHO PALMERAS DRIVE (*Looking Southbound*) at PARADISE VALLEY ROAD

EXHIBIT 2



PARADISE VALLEY ROAD (*Looking Eastbound*) at RANCHO PALMERAS DRIVE

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 3-way (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.

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.

MULTIWAY 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. Such crashes include right-turn and left-turn collisions, as well as right-angle collisions (i.e., broadside, or head-on) and pedestrian-vehicle collisions. Other types categorized as 'sideswipe', 'rear-end', and 'hit object' collisions are generally not considered susceptible to correction, unless further review indicates otherwise. The latest available collision history was gathered by HCI from the California Highway Patrol (CHP) Statewide Integrated Traffic Records System website (*i-SWITRS*), which is where local jurisdictions such as cities report their collisions.

Collision History (continued)

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 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?
Rancho Palmeras at Paradise Valley		*None reported*		*None reported*		*None reported*		*None reported*

Notes: Information above is derived per the latest 5-year intersection collision database report gathered from CHP-SWITRS (*i-SWITRS website*).

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

As shown, there have been zero (0) reported collisions at or near this intersection over the past (5) years of available SWITRS collision data. 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. ***The prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, March 11, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Rancho Palmeras Drive is 491 vehicles per day with the highest AM peak-hour volume having 42 vehicles, and 46 vehicles in the PM peak-hour. The bi-directional ADT count for Paradise Valley Road is 35 vehicles with the highest AM peak-hour volume having 6 vehicles, and 4 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The traffic volume data collected for this intersection is included in Appendix C.***

Traffic Volumes (continued)

TABLE 2
HIGHEST 24-HOUR INTERSECTION APPROACH VEHICLE COUNTS

Street	Direction	ADT Volume	Directional Split	Highest Hourly Volume
Rancho Palmeras Drive	Northbound	226	46%	26 (12 - 1 PM)
	Southbound	265	54%	27 (8 - 9 AM)
Paradise Valley Road	Eastbound	35	100%	6 (8 - 9 AM)

Rancho Palmeras Drive is considered the 'through' or 'major' street at this residential T-intersection since it carries higher volumes from both approaches, and drivers are not required to slow down, or even stop, before proceeding straight through the intersection. In comparison, Paradise Valley Road is considered the 'minor' street as drivers are required to stop at Rancho Palmeras Drive and look both ways before proceeding to make a left-turn or right-turn. It is typically expected that the traffic volumes on the minor street are significantly less than those on the major street. As can be seen from the table above, this is the case, as the minor street carries approximately 7% of the entire vehicular traffic entering the intersection (Rancho Palmeras Drive carries 93%).

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 sign installation are reduced to 70%. As mentioned, the posted speed limit on Rancho Palmeras Drive is 35 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at/below this posted speed near the intersection, and were considered typical of what may be expected for a two-lane collector type roadway. As the speed limit is less than the 40+ MPH limit required to reduce traffic volumes, the 70% minimum volumes for a multi-way stop sign analysis are <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the hourly vehicle traffic counts shown in Table 2 above are given for the highest one 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 must also be mentioned that the average hourly minimum volumes required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for 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 collected 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
RANCHO PALMERAS DRIVE AT PARADISE VALLEY ROAD

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,	***and***	**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,	***but***	**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.
Results:		**Results:**		**Results:**
No, average (37) vehicles per hour for highest 8 hours		**No, average (4) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 12% of required hourly traffic volume		**Meets 2% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*12% major street / 2% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

Driver sight distance was measured from the side-street approach, as eastbound traffic on Paradise Valley Road is required to stop, before making a left-turn or right-turn onto Rancho Palmeras Drive. The measured sight distance was derived from the stopping sight distance guidelines found in the California MUTCD ***(see Appendix D)***. In this reference, a 35 MPH roadway speed recommends a minimum Stopping Sight Distance of 250 feet. However, it is likely that the 85th percentile speeds typically exceed the 35 MPH posted speed limit. Therefore, a 40 MPH speed limit was used as a more conservative measure, which has a minimum sight distance of 305 feet.

This 305-foot distance was used when looking towards approaching, uncontrolled traffic along Rancho Palmeras Drive. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on Paradise Valley Road at the intersection looking towards the oncoming lanes of cross-traffic on Rancho Palmeras Drive. An orange cone was placed at this distance and a photograph was taken from a stopped driver's perspective (i.e., approx. 3.5 feet in height).

(***See sight distance photos in Exhibit 3 on the following page***).

As shown on Exhibit 3, a clear line of sight was achieved when looking from the side-street approach.

EXHIBIT 3



Eastbound PARADISE VALLEY ROAD (*Looking North*) at RANCHO PALMERAS DRIVE



Eastbound PARADISE VALLEY ROAD (*Looking South*) at RANCHO PALMERAS DRIVE

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 (i.e., Rancho Palmeras Drive). 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 most recent collision history at the intersection resulted in zero (0) SWITRS-reported collisions during the last five 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approach was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. If the California MUTCD criteria are not met, the location is typically not recommended for installation of a multi-way stop.

However, engineering judgment should always be included in any decision regarding traffic safety improvements. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 305 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a medium activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Ranchero Palmeras Drive at Paradise Valley Road is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (3-way) stop sign installation is not recommended for the intersection of Rancho Palmeras Drive and Paradise Valley Road. There are no other recommendations for the intersection at this time.

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).

Option:

10b YIELD or STOP signs may be used at a channelized turn lane if it is separated from the adjacent travel lanes moving in same direction by an island and the channelized turn lane is not controlled by a traffic control signal.

Standard:

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 Caltrans 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 Caltrans. Refer to CVC 21353.

Support:

17 Caltrans 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.

Section 2B.08 YIELD Sign (R1-2)

Standard:

01 **The YIELD (R1-2) sign (see Figure 2B-1) shall be a downward-pointing equilateral triangle with a wide red border and the legend YIELD in red on a white background.**

Support:

02 The YIELD sign assigns right-of-way to traffic on certain approaches to an intersection. Vehicles controlled by a YIELD sign need to slow down to a speed that is reasonable for the existing conditions or stop when necessary to avoid interfering with conflicting traffic.

Section 2B.09 YIELD Sign Applications

Option:

01 YIELD signs may be installed:

A. On the approaches to a through street or highway where conditions are such that a full stop is not always required.

B. At the second crossroad of a divided highway, where the median width at the intersection is 30 feet or greater. In this case, a STOP or YIELD sign may be installed at the entrance to the first roadway of a divided highway, and a YIELD sign may be installed at the entrance to the second roadway.

C. For a channelized turn lane that is separated from the adjacent travel lanes by an island, even if the adjacent lanes at the intersection are controlled by a highway traffic control signal or by a STOP sign.

D. At an intersection where a special problem exists and where engineering judgment indicates the problem to be susceptible to correction by the use of the YIELD sign.

E. Facing the entering roadway for a merge-type movement if engineering judgment indicates that control is needed because acceleration geometry and/or sight distance is not adequate for merging traffic operation.

Standard:

02 **A YIELD (R1-2) sign shall be used to assign right-of-way at the entrance to a roundabout. YIELD signs at roundabouts shall be used to control the approach roadways and shall not be used to control the circulatory roadway.**

03 **Other than for all of the approaches to a roundabout, YIELD signs shall not be placed on all of the approaches to an intersection.**

Section 2B.10 STOP Sign or YIELD Sign Placement

Standard:

01 **The STOP or YIELD sign shall be installed on the near side of the intersection on the right-hand side of the approach to which it applies. When the STOP or YIELD sign is installed at this required location and the sign visibility is restricted, a Stop Ahead sign (see Section 2C.36) shall be installed in advance of the STOP sign or a Yield Ahead sign (see Section 2C.36) shall be installed in advance of the YIELD sign.**

02 **The STOP or YIELD sign shall be located as close as practical to the intersection it regulates, while optimizing its visibility to the road user it is intended to regulate.**

02a YIELD signs shall not be erected upon the approaches to more than one of the intersecting streets. Refer to CVC 21356.

03 **STOP signs and YIELD signs shall not be mounted on the same post.**

04 **No items other than inventory stickers, sign installation dates, and bar codes shall be affixed to the fronts of STOP or YIELD signs, and the placement of these items shall be in the border of the sign.**

05 **No items other than official traffic control signs, inventory stickers, sign installation dates, anti-vandalism stickers, and bar codes shall be mounted on the backs of STOP or YIELD signs.**

06 **No items other than retroreflective strips (see Section 2A.21) or official traffic control signs shall be mounted on the fronts or backs of STOP or YIELD signs supports.**

APPENDIX B

SWITRS COLLISION HISTORY

CITY OF INDIAN WELLS
INTERSECTION OF RANCHO PALMERAS DRIVE AND PARADISE VALLEY ROAD
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.

NO COLLISIONS REPORTED.

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

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

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
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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Rancho Palmeras Dr & Paradise Valley Rd

Day: Tuesday
Date: 3/11/2025

Highest 8 Hours per Side-Street Perspective.

City: Indian Wells
Project #: CA25_030013_017

DAILY TOTALS	NB	SB	EB	WB	Total
	226	265	35	0	526

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00	0		1		1				2		12:00	9		8		1				18	
0:15	0		0		0				0		12:15	7		4		1				12	
0:30	0		0		0				0		12:30	7		2		0				9	
0:45	0		0	1	0	1			0	2	12:45	3	26	4	18	2	4			9	48
1:00	0		0		0				0		13:00	6		8		1				15	
1:15	0		0		0				0		13:15	7		2		1				10	
1:30	0		0		0				0		13:30	8		9		2				19	
1:45	0		0		0				0		13:45	4	25	2	21	0	4			6	50
2:00	0		0		0				0		14:00	5		6		0				11	
2:15	0		0		0				0		14:15	3		6		0				9	
2:30	0		0		0				0		14:30	2		3		1				6	
2:45	0		0		0				0		14:45	7	17	4	19	0	1			11	37
3:00	0		0		0				0		15:00	2		5		0				7	
3:15	0		0		0				0		15:15	6		3		1				10	
3:30	0		0		0				0		15:30	10		2		0				12	
3:45	0		1	1	0				1	1	15:45	5	23	1	11	2	3			8	37
4:00	0		1		1				2		16:00	5		1		0				6	
4:15	0		0		0				0		16:15	7		5		0				12	
4:30	1		2		0				3		16:30	3		3		0				6	
4:45	0	1	0	3	0	1			0	5	16:45	2	17	8	17	0				10	34
5:00	0		0		0				0		17:00	5		8		1				14	
5:15	2		0		0				2		17:15	3		4		0				7	
5:30	0		1		2				3		17:30	2		14		0				16	
5:45	0	2	0	1	0	2			0	5	17:45	2	12	5	31	1	2			8	45
6:00	0		2		0				2		18:00	3		6		0				9	
6:15	1		1		0				2		18:15	3		1		1				5	
6:30	0		0		0				0		18:30	2		3		0				5	
6:45	2	3	4	7	0				6	10	18:45	0	8	3	13	0	1			3	22
7:00	1		4		0				5		19:00	1		3		1				5	
7:15	0		1		0				1		19:15	1		1		0				2	
7:30	1		2		0				3		19:30	2		4		0				6	
7:45	3	5	9	16	0				12	21	19:45	3	7	1	9	1	2			5	18
8:00	2		7		2				11		20:00	3		2		0				5	
8:15	2		10		2				14		20:15	1		2		0				3	
8:30	7		6		1				14		20:30	3		3		0				6	
8:45	2	13	4	27	1	6			7	46	20:45	0	7	1	8	0				1	15
9:00	5		4		1				10		21:00	1		1		0				2	
9:15	7		1		1				9		21:15	0		1		0				1	
9:30	3		4		0				7		21:30	2		0		0				2	
9:45	3	18	7	16	0	2			10	36	21:45	1	4	1	3	0				2	7
10:00	4		3		0				7		22:00	0		0		0				0	
10:15	6		4		0				10		22:15	1		1		0				2	
10:30	2		7		0				9		22:30	0		0		0				0	
10:45	4	16	6	20	0				10	36	22:45	0	1	0	1	0				0	2
11:00	8		4		1				13		23:00	0		0		0				0	
11:15	6		5		0				11		23:15	0		0		0				0	
11:30	2		5		1				8		23:30	0		1		0				1	
11:45	5	21	7	21	4	6			16	48	23:45	0		0	1	0				0	1
TOTALS		79		113		18				210	TOTALS		147		152		17				316
SPLIT %		37.6%		53.8%		8.6%				39.9%	SPLIT %		46.5%		48.1%		5.4%				60.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	226	265	35	0	526

AM Peak Hour	11:45	7:45	11:30		11:45	PM Peak Hour	15:30	16:45	12:45		12:45
AM Pk Volume	28	32	7		55	PM Pk Volume	27	34	6		53
Pk Hr Factor	0.778	0.800	0.438		0.764	Pk Hr Factor	0.675	0.607	0.750		0.697
7 - 9 Volume	18	43	6	0	67	4 - 6 Volume	29	48	2	0	79
7 - 9 Peak Hour	7:45	7:45	8:00		7:45	4 - 6 Peak Hour	16:00	16:45	17:00		16:45
7 - 9 Pk Volume	14	32	6	0	51	4 - 6 Pk Volume	17	34	2	0	47
Pk Hr Factor	0.500	0.800	0.750	0.000	0.911	Pk Hr Factor	0.607	0.607	0.500	0.000	0.734

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 - 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.)

*** Posted speed limit, off-peak 85th-percentile speed prior to work starting, or other anticipated operating speed in mph.

Table 6C-2. Stopping Sight Distance as a Function of Speed on Level Roads. (Used as suggested longitudinal buffer space length or location for flagger station)

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 in mph.

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