



CITY OF LAGUNA HILLS TRAFFIC COMMISSION

REGULAR MEETING AGENDA Wednesday, May 19, 2021 – 7:00 PM

Anna Lisa Lukes - Chair

Chris Bieber - Vice Chair

Manuel Hernandez - Commissioner

Susan Caskey - Commissioner

Mark Schaff - Commissioner

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

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

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

CALL TO ORDER

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

PLEDGE OF ALLEGIANCE

ROLL CALL OF COMMISSION MEMBERS

1. PUBLIC COMMENTS

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

2. MINUTES**2.1 Minutes**

Recommendation: That the Traffic Commission Approve the Minutes of March 17, 2021.

3. PRESENTATIONS**4. ADMINISTRATIVE REPORTS****4.1 Nellie Gail Ranch Equestrian Crossing Review**

Recommendation: That the Traffic Commission Recommend 1) The Equestrian Trail Connection From the Nellie Gail Ranch Owners Association Equestrian Center to the Nellie Gail Road Trail Tunnel Southerly of Oso Parkway be Improved to Make it a More Desirable Route; 2) There be an Installation of two Additional Rectangular Rapid Flashing Beacons in the Median on Nellie Gail Road to Enhance the Existing Equestrian Crossing Visibility at the Equestrian Center; 3) Speed Enforcement be Scheduled Along Nellie Gail Road, as Resources Permit.

5. INFORMATIONAL ITEMS**5.1 Sheriff's Department Verbal Report****5.2 Radar Speed Trailer**

Recommendation: That the Traffic Commission Receive and File the Report.

6. COMMISSIONER COMMENTS**7. ADJOURNMENT**

The next Regular Meeting of the Traffic Commission will be July 21, 2021, at 7:00 PM in the City Council Chamber, located at 24035 El Toro Road, Laguna Hills California.

CERTIFICATION

I, KENNETH H. ROSENFELD, Interim City Manager/Director of Public Services of the City of Laguna Hills, do hereby certify that a copy of the foregoing Agenda was posted at Laguna Hills City Hall, Laguna Hills Community Center, and the Courtyard at La Paz Center by May 14, 2021, at 5:00 pm.



Interim City Manager/Director of Public Services**May 14, 2021**

Date

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

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



City of Laguna Hills

Traffic Commission

Staff Report

DATE: May 19, 2021
TO: Traffic Commissioners
FROM: Amber M. Shah P.E.
Associate Civil Engineer
ISSUE: Minutes

RECOMMENDATION: That the Traffic Commission Approve the Minutes of March 17, 2021.

ATTACHMENTS:

- TC Minutes March 17 2021

**CITY OF LAGUNA HILLS
TRAFFIC COMMISSION MEETING
REGULAR MEETING MINUTES
MARCH 17, 2021**

CALL TO ORDER

The Regular Meeting of the Traffic Commission of the City of Laguna Hills, California, was called to order by Commissioner Bieber at 7:00 PM in the Laguna Hills City Council Chamber, 24035 El Toro Road, Laguna Hills, California.

PLEDGE OF ALLEGIANCE

The Pledge of Allegiance was led by Commissioner Lukes.

ROLL CALL OF COMMISSION MEMBERS

Present: Commissioner Chris Bieber, Commissioner Susan Caskey, Commissioner Anna Lisa Lukes, and Commissioner Mark Schaff. Commissioner Manuel Hernandez joined the meeting at 7:05 p.m.

ELECTION OF CHAIR

Motion was made by Commissioner Bieber to open nominations to elect a new Chair. Chair Bieber nominated Chair Lukes. The nomination was seconded by Commissioner Caskey.

APPROVED BY A VOTE OF 4-0, COMMISSIONER HERNANDEZ ABSENT.

ELECTION OF VICE CHAIR

Motion was made by Commissioner Bieber to open nomination to elect a new Vice Chair. Commissioner Schaff nominated Commissioner Bieber. The nomination was seconded by Commissioner Lukes.

APPROVED BY A VOTE OF 4-0, COMMISSIONER HERNANDEZ ABSENT.

1. PUBLIC COMMENTS

There were no public comments.

2. MINUTES

THE TRAFFIC COMMISSION APPROVED THE MINUTES OF THE JANUARY 20, 2021, REGULAR MEETING, BY M/COMMISSIONER LUKES, S/COMMISSIONER BIEBER.

APPROVED BY A VOTE OF 4-0, COMMISSIONER HERNANDEZ ABSENT.

**TRAFFIC COMMISSION MEETING
MARCH 17, 2021**

3. PRESENTATIONS

Mr. Jerry Stock, of Hartzog and Crabill, Inc. gave an educational presentation of traffic engineering principles to the Traffic Commission.

4. ADMINISTRATIVE REPORTS

4.1 ESTABLISHMENT OF PERMIT PARKING CONTROL IN THE RIDGEFIELD NEIGHBORHOOD

Associate Engineer Amber Shah reported, in 2015, residents requested implementation of parking controls in the "Ridgefield Neighborhood" along the streets of Sierra Bonita Drive, La Cienega Street, Los Cerros Drive and Rio Grande. The residents were concerned with controlling overflow parking from other areas of the community. Based upon the resident's concerns, and in accordance with the Laguna Hills Municipal Code (LHMC), staff sent two parking control surveys to the residents of the Ridgefield Neighborhood to gauge their interest in parking controls. No consensus on parking controls receiving support from a two-thirds (67%) majority of the neighborhood (the threshold of support required by the LHMC). Subsequently, a resident of the Ridgefield Neighborhood contacted staff in August 2018 with a request to revisit the implementation of permit-based parking controls which would otherwise prohibit general overnight parking in their neighborhood. Staff provided a petition form, as permitted by the LHMC, for the resident to circulate by any resident of residential property abutting the proposed Residential Permit Parking Area. Last year, the resident submitted signed petitions indicating support of a minimum of 67% of the residents for a permit parking program. However, Traffic Commission meetings were cancelled due to the COVID-19 pandemic and the matter was deferred. Now that meetings have resumed, Staff recommends the Traffic Commission review this matter and recommend to the City Council the establishment of a no overnight permit parking program, including no parking during street sweeping hours, in the Ridgefield Neighborhood along the streets of Sierra Bonita Drive, La Cienega Street and Los Cerros Drive.

Patricia Thee, a resident, spoke in favor of permit parking in the Ridgefield neighborhood.

**THE TRAFFIC COMMISSION RECOMMENDED TO THE CITY COUNCIL THE ESTABLISHMENT OF A PERMIT PARKING PROGRAM AND NO PARKING DURING STREET SWEEPING HOURS IN THE RIDGEFIELD NEIGHBORHOOD ALONG THE STREETS OF SIERRA BONITA DRIVE, LA CIENEGA STREET AND LOS CERROS DRIVE, AND INSTRUCTED STAFF TO NOTIFY THE RESIDENTS ON RIO GRANDE OF THE PENDING CITY COUNCIL CONSIDERATION. BY, M/COMMISSIONER LUKES, S/COMMISSIONER SCHAFF.
APPROVED BY A VOTE OF 5-0, COMMISSIONER HERNANDEZ PRESENT.**

**TRAFFIC COMMISSION MEETING
MARCH 17, 2021**

4.2 NELLIE GAIL RANCH EQUESTRIAN CROSSING REVIEW UPDATE

Staff met with the Nellie Gail Ranch Equestrian Ad Hoc Committee (Committee) in the fall of 2020 to evaluate equestrian crossings in the Nellie Gail Ranch community. The Committee requested an evaluation of the equestrian crossing at the Equestrian Center driveway at the Nellie Gail Ranch Owners Association Equestrian Center on Nellie Gail Road southerly of Oso Parkway and expressed concerns about traffic controls at nearby intersections. Based upon the Committee's concerns and in accordance with the Residential Streets Management Policy, staff initiated a review of the Nellie Gail Equestrian Center driveway/equestrian crossing and three intersections along Nellie Gail Road at Empty Saddle Drive, Hidden Trail Road and Rocking Horse Lane. The Traffic Engineers of Hartzog & Crabill, Inc., (HCI) were retained and completed a traffic control and operational review of the Nellie Gail Equestrian Center driveway/equestrian crossing and analyses of three additional intersections. The report was presented at the January 2021 meeting of the Traffic Commission. The Traffic Commission continued the matter for further data collection. Ms. Shah indicated this update will be followed by a final report with recommendations at the May 2021 meeting of the Traffic Commission.

In response to the public comments received and Nellie Gail Ranch Equestrian Committee's request, staff is currently evaluating implementation of speed humps in the vicinity of the Equestrian Center Crossing in accordance with the Residential Streets Management Policy which requires the following minimum criteria are met:

- a) At least 67% of the affected residents of the street and adjacent area streets support the implementation of the physical device. The streets to be used to evaluate the support for the physical device will be those that reasonably can be inferred to draw traffic to the street of concern.
- b) The prevailing speed of traffic has been documented to be greater than 34 mph for at least two radar speed surveys taken 90 days apart as part of the follow-up evaluation of all other traffic controls used to address the issue.
- c) At least 1,500 vehicles traverse the street in a 24-hour period.
- d) The location meets the approval of the Police and Fire Department related to adequate response time of safety vehicles.
- e) The grade of the street shall not exceed 6%.
- f) The street must have a length of at least 1,300 feet and be able to accommodate a minimum of three speed humps unless otherwise directed by the City Council.

**TRAFFIC COMMISSION MEETING
MARCH 17, 2021**

- g) Other issues related to traffic engineering will be considered as deemed appropriate by the City Traffic Engineer.

Criteria c and f have been determined to have been met. Data collection is currently underway for the evaluation of the street grade (criteria e) and a second radar speed survey (criteria b) is scheduled in April 2021. Should both of these criteria be satisfied, next steps would include a survey of the affected residents (criteria a) and Police and Fire Department approval (criteria d).

The Committee also requested Rectangular Rapid Flashing Beacons (RRFB) in the median at and in advance of the Equestrian Center Crossing, and at Empty Saddle Drive and Rocking Horse Lane. Two Speed Feedback Signs (SFS) along Nellie Gail Road were also requested by the Committee. These requests are also currently being evaluated and will be addressed in the May 2021 staff report.

Pamela Fraser, of the Nellie Gail Trail and Safety Committee, spoke in favor of additional traffic control.

Paul Buller, a resident, spoke in favor of additional traffic control.

Jennifer Tullis, a resident, spoke in favor of additional traffic control.

Allison Smith, a resident, provided a video of an accident involving a pedestrian approximately at Nellie Gail and Empty Saddle and spoke in favor of additional traffic control.

**THE TRAFFIC COMMISSION RECEIVED AND FILED THE REPORT.
BY, M/COMMISSIONER CASKEY, S/COMMISSIONER HERNANDEZ.
APPROVED BY A VOTE OF 5-0.**

5. INFORMATIONAL ITEMS

5.1 SHERIFF'S DEPARTMENT VERBAL REPORT

Sergeant Scott Steinle introduced himself as the new Administrative Sergeant. Mr. Steinle has worked for the Sheriff's Department for 21 years, and as a Patrol Sergeant in the City for the last three years. Mr. Steinle indicated he looked forward to working with everyone.

5.2 RADAR SPEED TRAILER

Staff submitted the schedule for the radar trailer.

**TRAFFIC COMMISSION MEETING
MARCH 17, 2021**

**THE TRAFFIC COMMISSION RECEIVED AND FILED THE REPORT.
BY M/COMMISSIONER LUKES, S/COMMISSIONER CASKEY.
APPROVED BY A VOTE OF 5-0.**

6. COMMISSIONER COMMENTS

There were no Commissioner Comments.

7. ADJOURNMENT

There being no further business before the Traffic Commission at this session, Commissioner Bieber declared the meeting adjourned at 8:55 p.m.

Prepared By:

Amber Shah, P.E.
Associate Civil Engineer

Approved By:

Chair Anna Lisa Lukes

Attachment: TC Minutes March 17 2021 (2442 : Minutes)



City of Laguna Hills

Traffic Commission

Staff Report

DATE: May 19, 2021
TO: Traffic Commissioners
FROM: Amber M. Shah P.E.
Associate Civil Engineer
ISSUE: Nellie Gail Ranch Equestrian Crossing Review

RECOMMENDATION: That the Traffic Commission Recommend 1) The Equestrian Trail Connection From the Nellie Gail Ranch Owners Association Equestrian Center to the Nellie Gail Road Trail Tunnel Southerly of Oso Parkway be Improved to Make it a More Desirable Route; 2) There be an Installation of two Additional Rectangular Rapid Flashing Beacons in the Median on Nellie Gail Road to Enhance the Existing Equestrian Crossing Visibility at the Equestrian Center; 3) Speed Enforcement be Scheduled Along Nellie Gail Road, as Resources Permit.

SUMMARY:

Staff met with the Nellie Gail Ranch Equestrian Ad Hoc Committee (Committee) in the fall of 2020 to evaluate equestrian crossings in the Nellie Gail Ranch community. The Committee requested an evaluation of the driveway crossing at the Nellie Gail Ranch Owners Association Equestrian Center on Nellie Gail Road southerly of Oso Parkway and expressed concerns about traffic controls at nearby intersections. Based upon the Committee's concerns and in accordance with the Residential Streets Management Policy, staff initiated a review of the Nellie Gail Equestrian Center driveway/equestrian crossing and three intersections along Nellie Gail Road at Empty Saddle Drive, Hidden Trail Road and Rocking Horse Lane. The Traffic Engineers of Hartzog & Crabill, Inc., (HCI) were retained and completed a traffic control and operational review of the Nellie Gail Equestrian Center driveway/equestrian crossing and analyses of the three intersections. The report was presented at the January 2021 meeting of the Traffic Commission. Public comments in response to the report received via email prior to the January 2021 meeting were distributed to the Traffic Commissioners in advance of the meeting and

Nellie Gail Ranch Equestrian Crossing Review

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acknowledged at the meeting. The Traffic Commission continued the matter for further data collection.

Following an update presented at the March 2021 meeting of the Traffic Commission, and in accordance with the Traffic Commission's request for further data collection at the January 2021 meeting, follow-up speed surveys were performed in April 2021. The vehicle speeds recorded by radar were consistent with previous radar speed surveys primarily in the reasonably expected range of 32-34 mph, commonly found on streets with a 25 mph speed limit, and not, in and of themselves, of concern. The vehicle speeds recorded above 34 mph are higher than desirable or appropriate for the posted speed limit and given conditions and should be address through enforcement.

Staff evaluated the implementation of speed humps in the vicinity of the Equestrian Center Crossing based upon the minimum criteria set forth in the Residential Streets Management Policy. However, the road conditions do not support, and staff does not recommend, the installation of speed humps. Alternatively, staff evaluated the feasibility of a speed table at the Equestrian Center driveway/equestrian crossing. Installation of a speed table may be feasible but additional engineering design and analysis is required before a final recommendation can be made due to the location at a driveway intersection with larger vehicles and horse trailers needing proper transitioning to ascend to the raised table, turn, and descend to/from the driveway.

Staff recommends and strongly encourages that the Equestrian Committee and Nellie Gail Ranch Owners Association pursue a solution that would improve the equestrian trail access from the Equestrian Center to the existing Nellie Gail Road equestrian tunnel to make it a more desirable route. This approach would require some "retraining" of the equestrian community and would positively resolve expressed traffic control issues of concern at the use of the Equestrian Center Driveway at-grade crossing. Use of the tunnel provides a protected crossing that physically eliminates vehicle/equestrian conflicts. The City would also cooperate with these efforts and, if needed, seek to add lighting to the tunnel.

Staff also supports the Equestrian Committee's request to install two Rectangular Rapid Flashing Beacons (RRFB) in the median at the Equestrian Center Crossing to enhance the visibility of the existing at-grade crossing. Installation of RRFB at other equestrian crossings is not recommended at this time due to the low volume of pedestrian and equestrian crossings at the other locations.

BACKGROUND:

In 2012, the City Council approved the establishment of a staff directed Committee to review equestrian trail crossing markings and signage in and around the Nellie Gail Ranch community. Since the formation of the Committee, enhancements were made to numerous equestrian crossings. This effort included substantial improvements to the at-grade crossing at the Nellie Gail Equestrian Center driveway/equestrian crossing on Nellie Gail Road southerly of Oso Parkway including installation of an RRFB alert system. In the fall of 2020, the Committee contacted Staff with a request for a new evaluation of the driveway/equestrian crossing at the Nellie Gail Equestrian Center due to recent safety concerns. The Committee also requested an evaluation of other traffic controls at nearby intersections.

Based upon the Committee's request and in accordance with the Residential Streets Management Policy, staff initiated a review of the Nellie Gail Equestrian Center driveway/equestrian crossing location and three intersections along Nellie Gail Road. The Traffic Engineers of Hartzog & Crabill, Inc., (HCI) were retained and completed a traffic control and operational review of the Nellie Gail Equestrian Center driveway/equestrian crossing on Nellie Gail Road and multi-way stop sign analyses of three intersections along Nellie Gail Road at 1) Empty Saddle Drive, 2) Hidden Trail Road, and 3) Rocking Horse lane. The report was presented at the January 2021 meeting of the Traffic Commission. Public comments in response to the report received via email prior to the January 2021 meeting were distributed to the Traffic Commissioners in advance of the meeting and acknowledged at the meeting. The Traffic Commission continued the matter for further data collection. However, striping improvements to install yield markings at the equestrian crossing have been scheduled at Rocking Horse Lane.

Following an update presented at the March 2021 meeting of the Traffic Commission, and in accordance with the Traffic Commission's request for further data collection at the January 2021 meeting, follow-up speed surveys were performed in April 2021. The results of the follow-up speed surveys are included in the amended traffic control and operational review of the driveway/equestrian crossing at the Nellie Gail Equestrian Center on Nellie Gail Road, performed by HCI, attached. The follow-up speed surveys were performed on two days and determined the 85th percentile speeds in the 31-34 mph range for the 10:00 am to 11:00 am timeframe and for the noon to 1:00 pm timeframe on the first day are consistent with the previous radar speed surveys and are

Nellie Gail Ranch Equestrian Crossing Review

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not, in and of themselves, of concern. The radar speed surveys for the 11:00 am to noon timeframe are higher than desirable or appropriate for the posted speed limit and given conditions. On the second day, the radar speed surveys indicated mixed results with half of the speeds in the reasonably expected range of 32-34 mph, commonly found on streets with 25 mph speed limits, and the other half just slightly above this range. The vehicle speeds recorded above 34 mph are higher than desirable or appropriate for the posted speed limit and given conditions and should be address through enforcement.

In response to the public comments received and Nellie Gail Ranch Equestrian Committee's request, staff evaluated the implementation of speed humps in the vicinity of the Equestrian Center Crossing based upon the minimum criteria set forth in the Residential Streets Management Policy. However, the road conditions do not support, and staff does not recommend, the installation of speed humps due to the grade of the street exceeding 6 percent. Alternatively, staff evaluated the feasibility of a speed table at the Equestrian Center driveway/equestrian crossing. A speed table is similar to a speed hump in that it is raised in height approximately 3 inches but has a flat top long enough to accommodate the entire wheelbase of most passenger vehicles and spans the entire width of the street. They are recommended for consideration only on a street with a posted speed limit of 30 mph or less, as well as only with a grade of 8 percent or less. Installation of a speed table may be feasible but additional engineering design and analysis is required before a final recommendation can be made due to the proposed location at a driveway intersection with larger vehicles and horse trailers needing proper transitioning to ascend to the raised table, turn, and descend to/from the driveway.

There is also an existing equestrian tunnel under Nellie Gail Road with trail access that provides a viable alternate equestrian crossing to the Equestrian Center, despite expressions from equestrians that this route is not convenient or desirable. Use of the tunnel would fully eliminate traffic control issues and provide a protected crossing that physically eliminates vehicle/equestrian conflicts. Staff recommends and strongly encourages the Equestrian Committee and Nellie Gail Ranch Owners Association pursue a solution that would improve the equestrian trail access from the Equestrian Center to the existing Nellie Gail Road equestrian tunnel to make it a more desirable route. Additionally, the City would consider the installation of lighting in the tunnel, if needed, to address visibility concerns.

The Committee also requested Rectangular Rapid Flashing Beacons (RRFB) in the median at and in advance of the Equestrian Center Crossing, and at Empty Saddle Drive

Nellie Gail Ranch Equestrian Crossing Review

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and Rocking Horse Lane. Staff supports the request to install two RRFB in the median at the Equestrian Center Crossing to enhance the visibility of the at-grade crossing. Installation of RRFB at other crossings is not recommended at this time due to the low volume of pedestrian and equestrian crossings at these locations.

Two Speed Feedback Signs (SFS) along Nellie Gail Road were also requested by the Equestrian Committee. In accordance with the Residential Streets Management Policy incremental approach to resolving traffic safety issues, staff recommends the solutions currently recommended in this report be implemented before any additional measures are implemented. A literature review of SFS installations indicate they have a limited useful life meaning that motorists that frequent a route will commonly disregard the SFS over time. However, Staff does support the frequent but random placement of the City's radar trailer in this general vicinity.

FISCAL IMPACT:

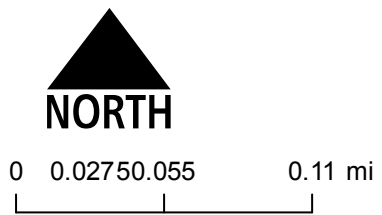
The installation of two Rectangular Rapid Flashing Beacons (RRFBs) have an anticipated cost of approximately \$5,000-\$10,000. Additional funding will need to be authorized by City Council for this work in the 2021-2022 Fiscal Year Public Works Maintenance Budget.

ATTACHMENTS:

- Nellie Gail Equestrian Crossings Vicinity Map
- Traffic Control Operational Review - Nellie Gail at Equestrian Center - Revised 05-12-21



Attachment: Nellie Gail Equestrian Crossings Vicinity Map (2443 : Nellie Gail Ranch Equestrian Crossing Review)



VICINITY MAP - NELLIE GAIL EQUESTRIAN CROSSINGS



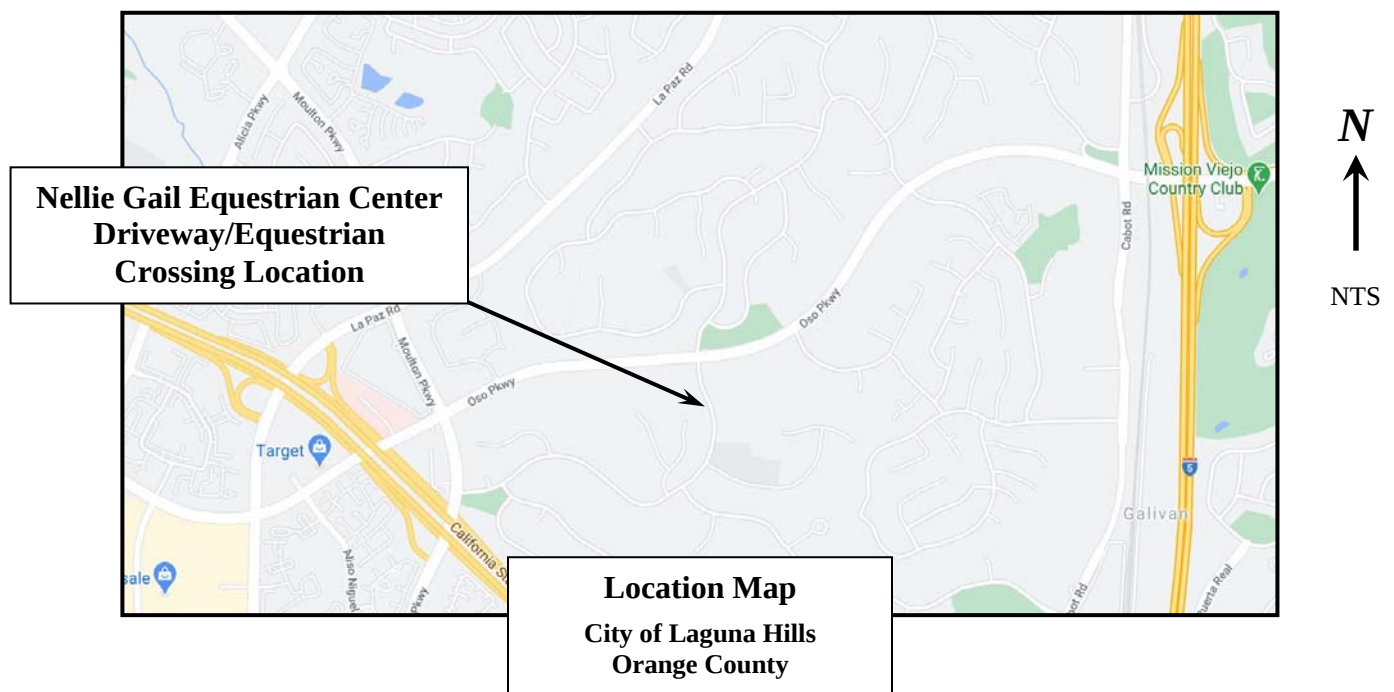
TRAFFIC CONTROL AND OPERATIONAL REVIEW

NELLIE GAIL ROAD AT THE EQUESTRIAN CENTER (S/o OSO PARKWAY) IN THE CITY OF LAGUNA HILLS, CA DECEMBER 3, 2020 (AMENDED MAY 12, 2021)

INTRODUCTION

The City of Laguna Hills requested Hartzog & Crabill, Inc. (HCI) to complete a Traffic Control and Operational Review at the Nellie Gail Equestrian Center driveway/equestrian crossing location. This location is along Nellie Gail Road, approximately 450 feet south of Oso Parkway.

The location is a typical driveway intersection with Nellie Gail Road running in the north-south directions and the Equestrian Center driveway running in the east-west directions, on the east side of Nellie Gail Road. The intersection is located west of the I-5 Freeway and south of Oso Parkway (*see Location Map below*). The location is entirely within the City of Laguna Hills jurisdiction. At the present time, there are no stop controls on Nellie Gail Road (i.e., it is uncontrolled); however, there is an existing Rectangular Rapid Flashing Beacon (RRFB) push-button warning light crossing system for the equestrian crossing location.



Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location, in Laguna Hills, CA

BACKGROUND

Nellie Gail Road is a north-south local-collector roadway with single-family residential properties on both sides of the street, along with an equestrian center on the east side of the street near Oso Parkway. At the intersection with the Equestrian Center driveway/equestrian crossing location, the roadway is approximately 60 feet wide, and the 2-lane roadway provides for one lane of traffic in each direction, which are separated by a raised landscaped center median. There are no marked crosswalks across Nellie Gail Road at or near the intersection. The roadway does have curb, gutter, sidewalk, and parkway improvements on the east side, and curb, gutter and parkway on the west side. There is a north-south equestrian path along the west side of the roadway. Nellie Gail Road has a posted speed limit of 25 MPH. On-street parking is prohibited on both sides of the street via No Parking Anytime signs. Currently, there are no STOP signs on Nellie Gail Road (i.e., uncontrolled) at its intersection with the Equestrian Center driveway/equestrian crossing location. As mentioned, there is an existing solar-powered Rectangular Rapid Flashing Beacon (RRFB) push-button warning light crossing system supplementing the equestrian crossing warning signs and yield line markings at this location.

The Equestrian Center Driveway is an east-west local driveway leading into the equestrian center parking lot and property. At the T-intersection with Nellie Gail Road, the driveway is approximately 20 feet wide. 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 the Equestrian Center driveway/equestrian crossing location. The driveway does not have curb, gutter, and sidewalk improvements on either side. There is no STOP sign or 'STOP' pavement marking, or white limit line on the westbound approach of the Equestrian Center driveway at its intersection with Nellie Gail Road (i.e., uncontrolled). However, being a driveway, and not a public street, a STOP sign is not required or expected to be installed at this Equestrian Center location, for the same reason most other driveways are not typically posted with a STOP sign.

Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA

DATA COLLECTION

As part of this particular review, the City requested collision history, a 24-hour speed count, and radar spot surveys to be included in the data collection.

Collision History

The latest available collision history for the driveway/equestrian crossing location was gathered by HCI from the State of California Highway Patrol (CHP) Statewide Integrated Traffic Records System website (*i-SWITRS*). A comprehensive 5-year traffic collision history summary report was prepared for this intersection and reviewed for collisions. Table 1 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2015-16		2017-18		2019		2020	
	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?
Nellie Gail Road at Equestrian Center driveway / Equestrian Crossing Location (450' S/o of Oso Pkwy)		<i>None reported</i>		<i>None reported</i>		<i>None reported</i>		<i>None reported</i>

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

As shown above, there have been no (0) reported collisions, at or near this location over the past (5) years of available SWITRS collision data. ***The SWITRS traffic collision data report prepared for this location is included in Appendix A.***

Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA

DATA COLLECTION (continued)

24-hour Speed Counts

This 5 consecutive day speed count was taken via machine counter and road tubes on Nellie Gail Road, north of Empty Saddle, just south of the raised landscaped center median. Road Tube Speed Counts are not as accurate as spot speed radar studies and can only be relied upon to suggest speed trends. This is currently observable when one compares the tube count 85th percentile speed to the radar measured 85th percentile speed indicating a lower prevailing speed of up to 6 mph. The speeds and Average Daily Traffic (ADT) count results are summarized below:

Thursday, October 29, 2020	<u>Average Speed (mph)</u>	<u>85th percentile Speed (mph)</u>	<u>ADT</u>
Northbound	30	35	
Southbound	32	38	
Both Directions	31	37	2,517
Friday, October 30, 2020	<u>Average Speed (mph)</u>	<u>85th percentile Speed (mph)</u>	<u>ADT</u>
Northbound	30	36	
Southbound	33	39	
Both Directions	32	38	2,309
Saturday, October 31, 2020	<u>Average Speed (mph)</u>	<u>85th percentile Speed (mph)</u>	<u>ADT</u>
Northbound	30	35	
Southbound	32	39	
Both Directions	31	37	2,211
Sunday, November 1, 2020	<u>Average Speed (mph)</u>	<u>85th percentile Speed (mph)</u>	<u>ADT</u>
Northbound	30	36	
Southbound	32	39	
Both Directions	31	38	1,467
Monday, November 2, 2020	<u>Average Speed (mph)</u>	<u>85th percentile Speed (mph)</u>	<u>ADT</u>
Northbound	30	35	
Southbound	33	38	
Both Directions	31	37	2,152

As shown above, the speeds were relatively consistent each day, and are higher than the posted speed limit of 25 mph. The southbound speeds were also consistently higher than northbound. ***The speed count data can be found attached in Appendix B.***

Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA

DATA COLLECTION (continued)

Spot Speed Radar Surveys

As a comparison, these one-hour spot speed radar surveys were taken via a person certified to use a radar speed gun at three (3) different locations along Nellie Gail Road. The results are summarized below:

1. Nellie Gail Road, 470 feet South of Oso Parkway (at/near the Equestrian Center)

Thursday, October 29, 2020 from 11:00am to Noon

	<u>50th percentile Speed (mph)</u>	<u>85th percentile Speed (mph)</u>
Northbound	28	33
Southbound	28	32
Both Directions	28	33

2. Nellie Gail Road, north of Empty Saddle Drive, just south of Raised Median

Thursday, October 29, 2020 from 12:30pm to 1:30pm

	<u>50th percentile Speed (mph)</u>	<u>85th percentile Speed (mph)</u>
Northbound	28	33
Southbound	28	35
Both Directions	28	34

3. Nellie Gail Road, between Empty Saddle Drive and Hidden Trail Road

Thursday, October 29, 2020 from 2:00pm to 3:00pm

	<u>50th percentile Speed (mph)</u>	<u>85th percentile Speed (mph)</u>
Northbound	31	36
Southbound	26	31
Both Directions	29	34

The 85th percentile speeds listed above, although higher than the 25 mph posted speed limit, is within the reasonably expected range of 32 – 34 mph commonly found on streets with 25 mph speed limits. This speed range, from a traffic engineering perspective, is not, in and of itself, of concern when taken together with zero documented traffic collisions at the study location. Speeds greater than this range, which are documented during two of the above six radar speed data collection procedures, should be addressed through enforcement.

Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA

DATA COLLECTION (continued)

Spot Speed Radar Surveys (cont'd)

In order to provide further speed comparison, one-hour spot speed radar surveys were taken again at/near the same three (3) locations along Nellie Gail Road for 2 midweek days: April 27th & April 29th, 2021. The latest first day results are summarized below:

1. Nellie Gail Road, 300 feet South of Oso Parkway (at/near the Equestrian Center)

Tuesday, April 27, 2021 from Noon to 1:00pm

	<u>50th percentile Speed (mph)</u>	<u>85th percentile Speed (mph)</u>
Northbound	27	33
Southbound	28	31
Both Directions	28	32

2. Nellie Gail Road, north of Empty Saddle Drive, just south of Raised Median

Tuesday, April 27, 2021 from 11:00am to Noon

	<u>50th percentile Speed (mph)</u>	<u>85th percentile Speed (mph)</u>
Northbound	31	38
Southbound	33	38
Both Directions	32	38

3. Nellie Gail Road, between Empty Saddle Drive and Hidden Trail Road

Tuesday, April 27, 2021 from 10:00am to 11:00am

	<u>50th percentile Speed (mph)</u>	<u>85th percentile Speed (mph)</u>
Northbound	28	34
Southbound	28	32
Both Directions	28	33

The 85th percentile speeds listed above for the 10:00 am to 11:00 am timeframe and for the noon to 1:00 pm timeframe are consistent with the previous radar speed surveys shown on page 5 and are not, in and of themselves, of concern. The radar speed surveys listed above for the timeframe of 11:00 am to noon are higher than reasonably expected or desired for the posted speed limit on this street and is an aid for police services to know when to target speed enforcement.

***Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA***

DATA COLLECTION (continued)

Spot Speed Radar Surveys (cont'd)

The second day results that were gathered on April 29, 2021 are summarized below:

1. Nellie Gail Road, 300 feet South of Oso Parkway (at/near the Equestrian Center)

Thursday, April 29, 2021 from 10:30am to 11:30am

	<u>50th percentile Speed (mph)</u>	<u>85th percentile Speed (mph)</u>
Northbound	28	35
Southbound	28	32
Both Directions	28	33

2. Nellie Gail Road, north of Empty Saddle Drive, just south of Raised Median

Thursday, April 29, 2021 from 11:30am to 12:30pm

	<u>50th percentile Speed (mph)</u>	<u>85th percentile Speed (mph)</u>
Northbound	31	37
Southbound	28	34
Both Directions	30	35

3. Nellie Gail Road, between Empty Saddle Drive and Hidden Trail Road

Thursday, April 29, 2021 from 12:30pm to 1:30pm

	<u>50th percentile Speed (mph)</u>	<u>85th percentile Speed (mph)</u>
Northbound	31	35
Southbound	29	34
Both Directions	30	34

The 85th percentile speeds listed above indicate mixed results in which half of the speeds are within the reasonably expected range of 32 – 34 mph, commonly found on streets with 25 mph speed limits, and the other half are just slightly above this range.

All radar spot speed study data can be found attached in Appendix C.

***Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA***

TRAFFIC CONTROL REVIEW

Traffic Signing & Striping

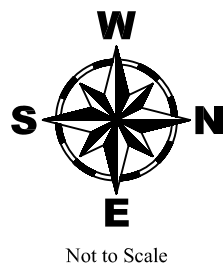
During our field-review on Wednesday, November 18, HCI staff walked Nellie Gail Road at/near the Equestrian Center driveway in both directions in order to review all the traffic signing & striping, including rumble strips, and RRFBs. The following page contains an exhibit of all signing & striping improvements. Below is a summary:

Southbound starting at Oso Parkway heading towards Rocking Horse Lane:

- “HORSE XING” advanced white pavement markings at/near Oso Parkway.
- “25” white pavement marking, along with a posted 25 MPH Speed Limit sign.
- “Notice 24-hour Security Patrol” sign posted on side of road.
- “No Parking Any Time” regulatory sign posted on side of road.
- “Equestrian Xing Ahead” advanced warning signs posted on side of road.
- Rumble strips composed of 4 rows of white raised pavement markers located at the above advanced sign posting.
- “HORSE XING” white pavement markings, with white yield line pavement markings at the Equestrian Center driveway.
- RRFB post with “Equestrian Xing” warning sign, Arrow pointing down, w/push buttons, and a “No Parking Any Time” sign.
- “No Parking Any Time” regulatory sign posted on side of road.
- “Side Road” T-intersection advance warning sign posted on side of road in advance of Empty Saddle, and a “No Parking Any Time” regulatory sign.
- “No Parking Any Time” regulatory sign posted on side of road.
- “Horse Xing” warning signs, Arrow pointing down, with white yield line pavement markings at Empty Saddle Drive.
- “Offset Side Roads” T-intersection advance warning sign posted on side of road between Empty Saddle Dr and Hidden Trail Rd.
- “Equestrian Xing” warning signs, Arrow pointing down, at Rocking Horse Lane.
- “25” white pavement marking, along with a posted 25 MPH Speed Limit sign, just past Rocking Horse Lane.

Northbound starting at Rocking Horse Lane heading towards Oso Parkway:

- “Horse Xing” warning signs, Arrow pointing down sign, at Rocking Horse Lane.
- “25 MPH Speed Limit” regulatory sign posted just past Hidden Trail Road.
- “Side Road” T-intersection advance warning sign posted on side of road in between Hidden Trail Road and Empty Saddle Drive.
- “Equestrian Xing” warning signs, Arrow pointing down, with white yield line pavement markings at Empty Saddle Drive.
- “WATCH DOWNHILL SPEED” warning sign, and a “No Parking Any Time” sign posted on side of road.
- “25 MPH Speed Limit” regulatory sign posted on side of road.
- “Raised Center Median” regulatory and warning signs posted in center of road.
- “No Parking Any Time” regulatory sign posted on side of road.
- “HORSE XING” advanced white pavement markings north of Empty Saddle.
- “Equestrian Xing Ahead” advanced warning signs posted on side of road, along with a “No Parking Any Time” sign.
- Rumble strips composed of 4 rows of white raised pavement markers located at the above advanced sign posting.
- “HORSE XING” white pavement markings, and white yield line pavement markings at the Equestrian Center driveway.
- Solar-powered RRFB post with “Equestrian Xing” warning sign, Arrow pointing down, and with push buttons.
- “No Parking Any Time” regulatory sign posted on side of road.
- “SIGNAL AHEAD” white pavement markings, along with a “Signal Ahead” sign posted on the side of the road.
- “No Parking Any Time” regulatory sign posted on side of road.
- “No Parking Any Time” regulatory sign posted on traffic signal pole located at Oso Parkway.



FILE: NELLIE GAIL ROAD.dwg

*Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA*

OPERATIONAL REVIEW

RRFB System

During our field-review on Wednesday, November 18, HCI staff physically activated all the push-buttons at the Equestrian Center driveway/equestrian crossing location (both pedestrian and equestrian buttons), and verified that the existing solar-powered Rectangular Rapid Flashing Beacon (RRFB) system was working properly.

The actual RRFB LED light bar that has two alternating yellow warning lights is located on the post just under the “Equestrian Crossing” warning sign on each side of the roadway. All push buttons and RRFB LED yellow warning lights were operating as intended.

In summary, when either a pedestrian or equestrian push one of the buttons at this equestrian crossing location, the post-mounted RRFB LED yellow warning light bars on each side of the roadway activate and continue to flash away toward drivers on Nellie Gail Road for at least 30 seconds, giving warning that someone is crossing the street.

Staff tested the time to cross Nellie Gail Road several times by foot, and was able to cross the street each time within the 30 seconds of flashing yellow warning.

*Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA*

OPERATIONAL REVIEW *(continued)*

Visibility

Impaired visibility, or restricted sight distance, due to the geometry of the intersection and possible obstructions was carefully considered during our field-review of the surrounding property environment. The geometry of the driveway intersection includes an approximate 90° angle, and northbound Nellie Gail Road has a gradual vertical curvature (downgrade) heading into and beyond the Equestrian Center driveway.

Driver sight distance was measured from the side-street approach, as westbound traffic on the Equestrian Center driveway is required to stop, before proceeding to make a left or right-turn onto Nellie Gail Road. The measured distance was derived from the stopping sight distance guidelines found in the California MUTCD (*see Appendix D*). In this reference, a 25 MPH roadway speed recommends a minimum Stopping Sight Distance of 155 feet. However, as shown, the 85th percentile speeds exceed the 25 MPH posted speed limit. Therefore, a 30 MPH speed limit was used as a more conservative measure, which has a minimum sight distance of 200 feet. This distance was used when looking towards approaching, uncontrolled traffic along Nellie Gail Road. More specifically, this stopping sight distance was field-measured from a typical ‘stopped’ vehicle location at the Equestrian Center driveway looking towards the oncoming lanes of cross-traffic on Nellie Gail Road. An orange cone was placed at this distance and a photograph was taken from a stopped driver’s perspective (i.e., approximately 4.5’ high above ground).

(See sight distance photos in Exhibits 1 & 2 on the following pages).

As the exhibits show, when looking from the Equestrian Center driveway, a driver does have a clear line of sight to the minimum 200-foot sight distance when looking both ways on Nellie Gail Road. It is important to note, since this location is an equestrian crossing, it is expected that equestrians having a higher field of view than a vehicle (i.e., approximately 8.5 feet above ground) also have a clear line of sight to the minimum sight distance of 200 feet along Nellie Gail Road, which was also verified in the field.

Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA

EXHIBIT 1

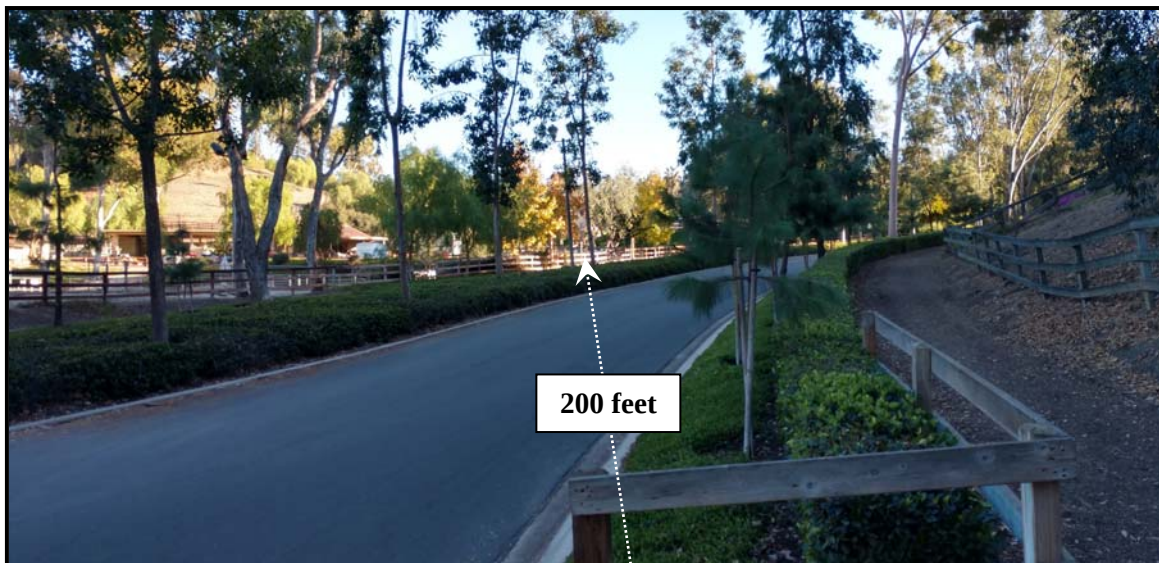


***Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA***

EXHIBIT 2



Eastbound EQUESTRIAN CENTER DRIVEWAY (Looking North) @ NELLIE GAIL ROAD



Eastbound EQUESTRIAN CENTER DRIVEWAY (Looking South) @ NELLIE GAIL ROAD

*Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA*

OPERATIONAL REVIEW (continued)

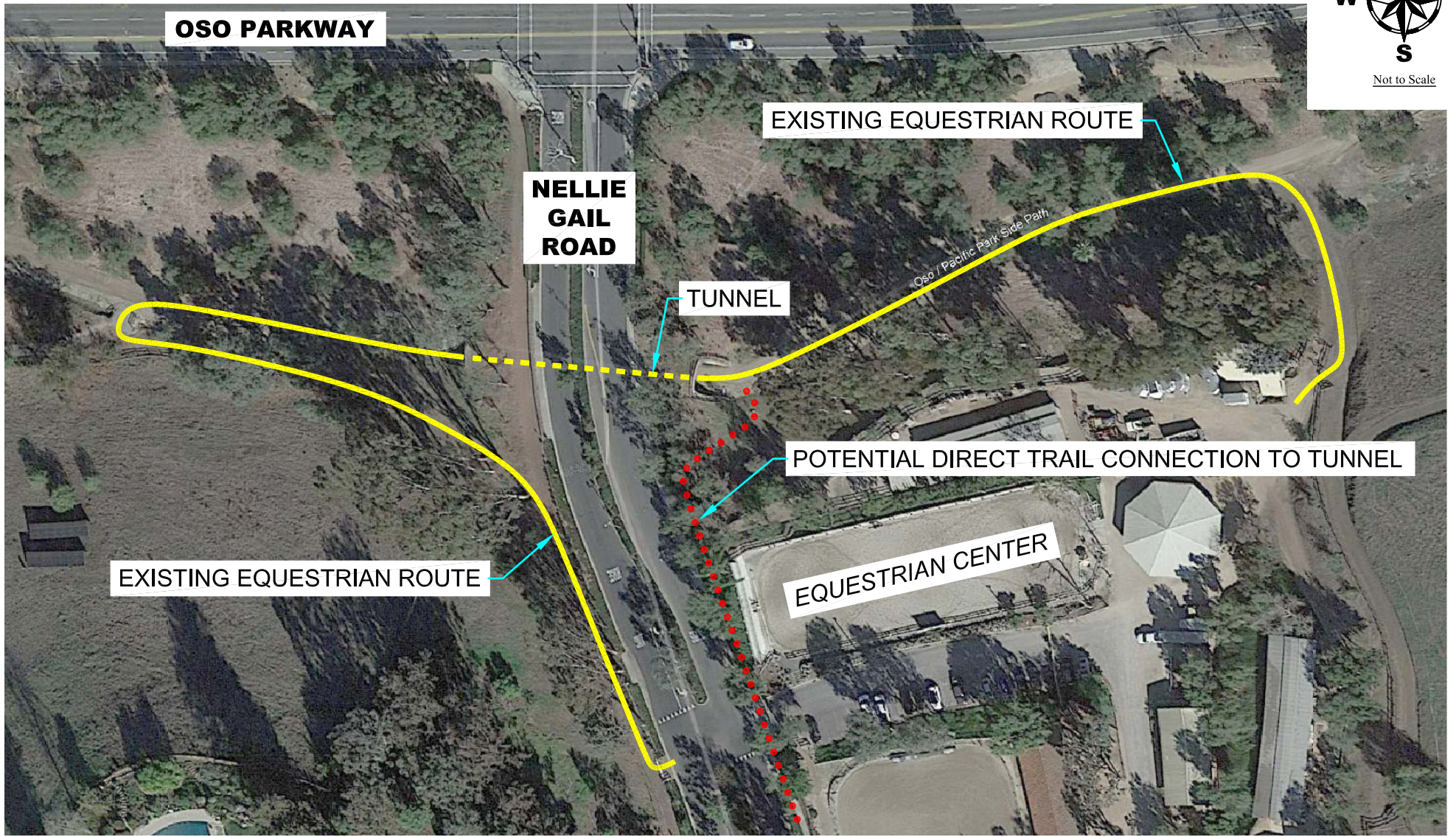
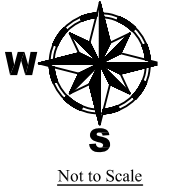
Equestrian Tunnel

There is an existing equestrian tunnel perpendicular to and under Nellie Gail Road, that is located north of the Equestrian Center driveway/equestrian crossing location, and south of Oso Parkway. There is also an existing equestrian path to access the tunnel from the west side of Nellie Gail Road from the equestrian crossing location. At this time, there is no direct equestrian path to access the tunnel from the east side of Nellie Gail Road.

HCI staff walked and field-checked the access from the west side of the Equestrian Center driveway intersection, and followed the equestrian path northerly down towards the tunnel. At the bottom of the path, just in front of the tunnel, the concrete and corrugated metal tunnel was large enough for equestrians to pass safely from the west side of Nellie Gail Road to the east side, and back. Staff noticed the tunnel did not have existing lighting fixtures. Once on the east side of the tunnel, it appeared that equestrians can take the designated trail path to access the equestrian center, which also runs along the south side of Oso Parkway from Nellie Gail Road easterly to Cabot Road.

HCI staff walked back the equestrian path from the east side of Nellie Gail Road, through the tunnel to the west side of Nellie Gail Road, and continued back up the path to the Equestrian Center driveway/equestrian crossing location. The entire time it took to complete the tunnel path on foot was approximately 2 minutes and 15 seconds.

Equestrians have expressed a concern about the potential of vehicle versus equestrian conflicts at the equestrian center driveway/equestrian crossing that is the subject of this report. Given this concern, it is reasonable and appropriate for the equestrians to seek an alternate route which is provided by the Tunnel. The next page (page 15) contains an aerial exhibit showing how the tunnel is accessed going to and from the equestrian center.



Attachment: Traffic Control Operational Review - Nellie Gail at Equestrian Center - Revised 05-12-21

ALTERNATE EQUESTRIAN CROSSING ROUTE
 Nellie Gail Road
 CITY OF LAGUNA HILLS

***Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location, in Laguna Hills, CA***

OPERATIONAL REVIEW (continued)

Equestrian Input

During our field review, HCI staff was able to speak with an equestrian that had just crossed Nellie Gail Road at the Equestrian Center driveway/equestrian crossing location. When discussing the tunnel, the equestrian mentioned that it is a viable alternative path for access to the Equestrian Center from the west side of Nellie Gail Road, and is “just less convenient” than to use than the Equestrian Center driveway/equestrian crossing location.

In discussing the Equestrian Center driveway crossing location, the equestrian provided the following couple of quotes:

- “Drivers are speeding over the speed limit, especially in the northbound direction”
- “Drivers are on their phones, especially at night”. Meaning that certain drivers are speeding over the posted 25 MPH speed limit, distracted, and not paying enough attention to safely slow/stop for the equestrians crossing.

Overview of Equestrian Tunnel Access

Staff’s field observations confirmed the potential for the use of this tunnel as a viable alternate equestrian trail ‘tunnel’ crossing, despite the lack of convenience; and if utilized, would resolve traffic controls issues that have been raised at the Equestrian Center driveway/equestrian crossing location. Moreover, the existing path to the tunnel from the west-side of Nellie Gail Road does not appear different or ‘less convenient’ than any other designated equestrian paths found behind homes throughout the City. Therefore, in our overall review of the existing tunnel, we find that it provides a protected crossing that physically eliminates vehicle/equestrian conflicts.

*Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA*

OPERATIONAL REVIEW (continued)

Overview of Equestrian Tunnel Access (cont'd)

The following improvements could be considered in order to make it more of a preferred crossing:

- Install equestrian tunnel lighting fixtures at/near the tunnel, since equestrians prefer to cross when the line of sight is clear, and it is helpful for horses to see light at the end of the tunnel.
- Install equestrian fencing to better delineate the existing path.
- The City in partnership with the Equestrian Center may consider improving the east side of Nellie Gail Road in front of the equestrian center, in order to provide a direct equestrian path towards the tunnel along the east side, as well as connect to the existing equestrian path south of the equestrian center (see proposed path shown in red on Page 15).

Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA

IN-ROADWAY WARNING LIGHTS REVIEW

The City also received a question by the public regarding the possibility of adding ground flashing pavement lights, or In-Roadway Warning Lights (IRWL). These traffic control devices are typically installed in the pavement along both sides of a marked crosswalk and operate flashing yellow lights towards oncoming vehicles upon pedestrian activation.

The State of California Manual on Uniform Traffic Control Devices (CA MUTCD) describes this type of traffic control device as follows:

In-Roadway Lights are special types of highway traffic signals installed in the roadway surface to warn users that they are approaching a condition on or adjacent to the roadway that might not be readily apparent and might require the road users to slow down and/or come to a stop.

Below are some of the applicable guidelines found in the California MUTCD for installation of this type of traffic control device:

Section 4N.02 In-Roadway Warning Lights at Crosswalks

Standard:

- *If used, In-Roadway Warning Lights at crosswalks shall be installed only at marked crosswalks with applicable warning signs. They shall not be used at crosswalks controlled by YIELD signs, STOP signs, or traffic signals.*
- *They shall display a flashing yellow light when actuated.*
- *Consideration for whether the crossing is controlled or uncontrolled.*

Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA

IN-ROADWAY WARNING LIGHTS REVIEW (continued)

- *An engineering traffic study to determine if In-Roadway Warning Lights are compatible with the safety and operation of nearby intersections, which may or may not be, controlled by traffic signals or STOP/YIELD signs.*
- *At least 40 pedestrians regularly use the crossing during each of any two hours (not necessarily consecutive) during a 24-hour period.*
- *The vehicular volume through the crossing exceeds 200 vehicles per hour in urban areas or 140 vehicles per hour in rural areas during peak-hour pedestrian usage.*
- *The critical approach speed (85th percentile speed) is 45 mph or less.*
- *In-Roadway Warning Lights are visible to drivers at the minimum stopping sight distance for the posted speed limit.*
- *Public education on In-Roadway Warning Lights is conducted for new installations.*

The California MUTCD guidelines in Chapter 4N. In-Roadway Lights can be found in Appendix E.

It is important to note, the existing Equestrian Center driveway/equestrian crossing location does not have a marked crosswalk across Nellie Gail Road, but only Yield line pavement markings where vehicles are to wait on each approach lane when the RRFBs are activated. However, if the location was modified with the installation of a marked crosswalk, the addition of IRWLs at this existing RRFB warning location is a possible traffic control device that may be considered appropriate upon the completion of an IRWL evaluation.

*Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA*

IN-ROADWAY WARNING LIGHTS EVALUATION

Upon City request, HCI collected pedestrian/bicycle/equestrian and vehicular count data, at the Equestrian Center driveway/equestrian crossing location, on Saturday, January 9, 2021. The count data was collected between the hours of 7:00am – 4:00pm. In brief summary, below is a site specific IRWL evaluation for the City's consideration:

- At least 40 pedestrians regularly use the crossing during each of any two hours (not necessarily consecutive) during a 24-hour period.
The highest 2 hours were: 11am – Noon with 15 pedestrians/bicyclists/equestrians; and 3 – 4pm with 10 pedestrians/bicyclists/equestrians.
- The vehicular volume through the crossing exceeds 200 vehicles per hour in urban areas during peak-hour pedestrian usage.
The highest 2 hours were: 11am – Noon with 160 vehicles; and 3 – 4pm with 163 vehicles.
- The critical approach speed (85th percentile speed) is 45 mph or less.
Yes.
- In-Roadway Warning Lights are visible to drivers at the minimum stopping sight distance for the posted speed limit.
IRWLs are expected to be visible to the minimum stopping sight distance.

In review of the above IRWL evaluation factors, the minimum pedestrians/bicyclists/equestrians, as well as the minimum traffic volumes, were not met for the highest 2 hours of the day.

*Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA*

RRFB VS. IRWL OPINION

Since an IRWL evaluation was not completed as part of this evaluation report, the following opinion as to the relative effectiveness of the existing RRFB installation versus the addition of the IRWL is offered for the City's consideration:

- Recent studies of the top three safety beacons rank the RRFB as the most effective and cost-efficient crosswalk device.
- Tests prove the RRFB can heighten driver yield rates by up to 96% and reduce pedestrian crashes by 47%.
- Due to the high-intensity LEDs installed at heights to capture drivers' awareness from greater distances day and night, RRFBs outperform traditional crosswalk warning lights.
- Drivers react sooner at the sight of a flashing RRFB, even under challenging conditions, such as inclement weather, headlight glare, and limited visibility.
- Studies find two RRFB devices work well; however, safety margins improve with four or more RRFB devices on roadways with heavy traffic or higher speed limits with multiple lanes.

The cost to furnish and install an RRFB system can vary depending on site conditions and the number and type of RRFBs used. An average cost for an RRFB complete system is \$22,250 including installation, labor, and materials.

In comparison to RRFBs, research shows the IRWLs did decline motorists' speeds; however, the rate of yielding became less over time in some cases as drivers became more familiar with the crosswalk treatment. Also, drivers have difficulty seeing the devices in daylight, and the flashing lights are also difficult to see when following other vehicles.

Damage to the IRWLs and malfunction issues remain a significant drawback as they are embedded into the asphalt. Several jurisdictions are removing IRWL systems due to unreliability, maintenance costs, and ineffectiveness compared with other safety beacons.

*Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA*

RRFB VS. IRWL OPINION (continued)

The cost to furnish and install an IRWL system can vary depending on the manufacturer, roadway widths, and project specific installation factors. An average cost for an IRWL complete system is \$17,620.

Therefore, it is our opinion that the existing RRFB system located at the Equestrian Center driveway/equestrian crossing location works well. If the City desires to improve the location, adding 2 more RRFBs in the median and/or in advance of the Equestrian Center driveway/equestrian crossing location could be considered.

Several RRFB related published studies are provided below:

1. **US Department of Transportation:** Sept – Oct [Innovator newsletter](#) – *States Step up to Enhance Pedestrian Safety, Spectacular Seven.* (2019).
2. **Carmanah:** <https://carmanah.com/articles/an-overview-of-the-most-effective-crosswalk-treatments/>. (October 7, 2019)
3. **Federal Highway Administration** – The National Academies of Sciences, Engineering, Medicine – *Crash Modification Factors Clearinghouse* – [Study Details for Uncontrolled Pedestrian Crossing Treatments](#). (2017).
4. **Federal Highway Administration**– *Evaluation of Pedestrian Hybrid Beacons and Rapid Flashing Beacon* – [report](#). (2016) (PDF).
5. **Federal Highway Administration** – [Effects of Yellow Rectangular Rapid-Flashing Beacons on Yielding Multilane Uncontrolled Crosswalks](#). (2010).
6. **Transportation Research Board** – *An Analysis of the Effects of Stutter Flash LED Beacons to Increase Yielding to Pedestrians Using Multilane Crosswalks*. (2009). [RRFB](#)

*Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA*

SPEED TABLE

The City also requested HCI to discuss the potential for a speed table to be installed at this Equestrian Center driveway/equestrian crossing location. According to the US Department of Transportation, Federal Highway Administration (FHWA), Traffic Calming ePrimer Module 3,¹ a speed table is a raised area placed across the roadway designed to physically limit the speed at which a vehicle can traverse it. Speed tables typically extend across the roadway, and have a flat top (typically 10 feet) long enough to accommodate the entire wheelbase of most passenger vehicles. The longer longitudinal depth in the direction of travel enables comfortable and safe vehicle operating speeds. Speed tables are designed to produce sufficient discomfort to a motorist driving above the speed table design speed in order to discourage speeding. Speed tables have a less jarring effect on long, stiff-bodied emergency service vehicles.

In addition, when a speed table is designated as a crosswalk through the use of striping, it is known as a raised crosswalk. Speed tables are generally not appropriate when the 85th percentile speed is 45 MPH or more. Speed tables are typically installed with an urban cross-section (i.e., curb & gutter) but an open section can be acceptable. They can be applied both with and without sidewalks or bicycle facilities. If the street does not have curbing, an obstruction such as signing, flexible delineator posts or bollards may be acceptable to prevent a motorist from driving around the table.

Institute of Transportation Engineers (ITE) Guidelines have recommendations for consideration of speed tables only on a street with a posted speed limit of 30 mph or less, as well as only with a grade of 8 percent or less.

*Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA*

SPEED TABLE (continued)

Most agencies implement speed tables with a height between 3 and 3.5 inches, and an overall travel length of 22 feet. The most common speed table consists of a 10 foot plateau with 6 foot approaches on both sides that can be straight, parabolic, or sinusoidal in profile.

Speed tables with heights as great as 6 inches, ramps of up to 10 feet, and plateaus between 18 and 23 feet in length have been tested and found to better accommodate large vehicles with long wheelbases (such as fire trucks and transit buses).

A speed table should be clearly marked, so all roadway users are able to anticipate it and reduce their speeds appropriately.

Placement factors include consideration of vertical and horizontal alignment of street, proximity to the nearest intersection, location of driveways and on-street parking, presence or absence of street lighting, location of designated pedestrian crossings, drainage, and utility access points (i.e., drains, valves, etc.). Typically, the placement does not interfere with drainage because the table does not extend from curb to curb; however, if drainage gutter or flow of water is in the center of the roadway, drainage and hydraulic impacts need to be evaluated.

There is potential for increased noise due to vehicle braking and accelerating, and to the vibration of loose items in truck beds or trailers.

*Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA*

SPEED TABLE (continued)

Whether to consider if a speed table may be installed at the Nellie Gail Equestrian Center Driveway/Equestrian Crossing location, since the posted speed limit is less than 30 mph, 85th percentile speeds are under 45 MPH, and there may be a grade of 8 percent or less, if the City desires to install a speed table, it is considered feasible.

However, as this location is a driveway intersection serving the Equestrian Center, certain factors will need to be decided and designed, such as how wide or long to make the actual flat top part (i.e, 10 feet or greater) and approaches, since a higher amount of trucks with horse trailers are expected to turn into the Equestrian Center driveway. These larger vehicles will need proper transitioning to ascend to the raised table, turn, and descend to/from the driveway. As mentioned, a plateau of up to 23 feet, or even longer, may be considered at this location to try and cover the majority of the driveway intersection (i.e., this may now be referred to as a raised intersection).

Another factor that will need to be evaluated is the possible interference with drainage, not only along Nellie Gail Road but the driveway as well, since the speed table will need to include transition towards the driveway approach.

It is also important to note, a speed table is expected to reduce 85th percentile speeds to the range of 25 to 35 MPH when crossing the table. It has been shown through recent radar data that the 85th percentile speeds are in the range of 32 – 35 at/near this location.

1. **US Department of Transportation:** Federal Highway Administration, Traffic Calming ePrimer Module 3, 3.12 Speed Table (website page last modified February 15, 2017).

*Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA*

OVERALL RESULTS & FINDINGS

Nellie Gail Road at the Equestrian Center Driveway/Equestrian Crossing Location

Collision Data Results = 0 in past five years

24-hour Speed Count – 85th Percentile Average Results = 37 MPH

Spot Speed Radar Survey – 85th Percentile Average Results = 34 MPH

Traffic Control Review:

- ✓ “HORSE XING” advanced white pavement markings.
- ✓ “25” white pavement marking, along with a posted 25 MPH Speed Limit sign.
- ✓ “Equestrian Xing Ahead” advanced warning signs posted on side of road.
- ✓ Rumble strips composed of 4 rows of white raised pavement markers located at the above advanced sign posting.
- ✓ “HORSE XING” white pavement markings, along with white yield line pavement markings at the Equestrian Center driveway location.
- ✓ Solar-powered RRFB system on posts with “Equestrian Xing” warning signs and Arrow pointing downward, with push buttons.

HCI staff physically activated all the push-buttons at this Equestrian Center driveway/equestrian crossing location (both pedestrian & equestrian buttons), and verified that the RRFB system was working properly. All push buttons and RRFB LED yellow warning lights were operating as intended. Also, when looking from the Equestrian Center driveway/equestrian crossing location, a driver does have a clear line of sight to the minimum 200-foot sight distance when looking along Nellie Gail Road. Since this location is an equestrian crossing, it is expected that equestrians, having a higher field of view than a vehicle (i.e., approximately 8.5 feet above ground vs. 4.5 feet), also have a clear line of sight to the minimum sight distance of 200 feet along Nellie Gail Road.

There is also an existing equestrian tunnel that is located under Nellie Gail Road, just north of Equestrian Center driveway/equestrian crossing location and south of Oso Parkway, which is a viable alternative. A few improvements are provided to consider.

A speed table was also discussed for possible installation at the Nellie Gail Equestrian Center Driveway/Equestrian Crossing location. If the City desires to install a speed table, it is considered feasible and would have to be properly designed as a raised intersection.

Finally, in regards to RRFBs vs IRWLs, the IRWL evaluation did not meet the minimum guidelines for installation at this location, and it is our opinion that the existing RRFB system works well. The placement of two additional RRFBs in the median island is a potential consideration.

*Traffic Control & Operational Review:
Nellie Gail Equestrian Center Driveway/Equestrian Crossing Location in Laguna Hills, CA*

RECOMMENDATIONS

In overall consideration of the traffic control and operational review of the Nellie Gail Road Equestrian Center driveway/equestrian crossing location, the existing traffic control installations are satisfactory and supported by the zero collision history. There are no other specific recommendations at this time.

A few options that the City may desire to consider:

- Improve visibility by removing certain trees near equestrian driveway location.
- Install equestrian tunnel lighting fixtures at/near the tunnel, since equestrians prefer to cross when the line of sight is clear, and it is helpful for horses to see light at the end of the tunnel.
- Install equestrian fencing on west side of Nellie Gail Road to better delineate the existing path to tunnel.
- The City in partnership with the Equestrian Center may consider improving the east side of Nellie Gail Road in front of the equestrian center, in order to provide a direct equestrian path towards the tunnel along the east side, as well as connect to the existing equestrian trail south of the equestrian center (see proposed path shown in red on Page 15).
- A speed table is shown to be viable if the City desires to consider a raised intersection.

APPENDIX A

SWITRS COLLISION HISTORY

CITY OF LAGUNA HILLS
5-YEAR SWITRS COLLISION DATABASE
INTERSECTION OF NELLIE GAIL RD AT EQUESTRIAN CENTER S/o OSO PKWY
JAN. 1, 2015 - SEPTEMBER 30, 2020

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	ROA SURF
---------	------------	------------	--------------	----------------	-------	------	---------	----------	----------------	-------------------	----------------	-----------	-------------	---------------	-----------------------------	----------

None 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

PCF Violation Category

01 - Driving or Bicycling Under Influenza
 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

Type of Collision

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

Motor Vehicle Involved With:

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

Road Surface

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

APPENDIX B

24-HOUR SPEED COUNT DATA

SPEED

Nellie Gail Rd Bet. Empty Saddle Dr & Oso Pkwy

4.1.b

Day: Thursday
Date: 10/29/2020

City: Laguna Hills
Project #: CA20_010022_010

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	1	5	2	4	0	0	0	0	0	0	0	12
01:00	0	0	0	0	0	2	0	1	0	0	0	0	0	3
02:00	0	0	2	1	0	0	0	0	0	0	0	0	0	3
03:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2
04:00	0	0	0	1	2	0	0	0	0	0	0	0	0	3
05:00	0	0	1	4	5	2	1	0	0	0	0	0	0	13
06:00	0	0	4	9	21	10	0	0	0	0	0	0	0	44
07:00	0	0	10	36	47	29	5	0	0	0	0	0	0	127
08:00	0	1	13	44	63	22	9	1	0	0	0	0	0	153
09:00	0	1	7	42	64	35	1	0	0	0	0	0	0	150
10:00	0	5	16	34	44	22	2	2	0	0	0	0	0	125
11:00	3	6	18	58	70	30	3	1	0	0	0	0	0	189
12:00 PM	0	4	16	61	57	28	4	0	0	0	0	0	0	170
13:00	0	2	14	50	50	35	4	1	0	0	0	0	0	156
14:00	0	3	23	45	54	25	5	2	0	0	0	0	0	157
15:00	1	2	17	60	80	43	8	1	0	0	0	0	0	212
16:00	0	2	19	72	102	51	4	0	0	0	0	0	0	250
17:00	1	1	35	73	74	38	6	1	1	0	0	0	0	230
18:00	1	2	24	53	84	30	13	0	1	0	0	0	0	208
19:00	0	1	5	44	52	30	5	2	0	0	0	0	0	139
20:00	0	1	10	22	26	15	7	2	1	0	0	0	0	84
21:00	0	0	5	11	13	13	5	2	0	0	0	0	0	49
22:00	0	1	3	4	9	6	0	2	0	0	0	0	0	25
23:00	0	0	4	2	3	4	0	0	0	0	0	0	0	13
Totals	6	32	247	731	924	474	82	18	3					2517
% of Totals	0%	1%	10%	29%	37%	19%	3%	1%	0%					100%

AM Volumes	3	13	72	234	320	156	21	5	0	0	0	0	0	824
% AM	0%	1%	3%	9%	13%	6%	1%	0%						33%
AM Peak Hour	11:00	11:00	11:00	11:00	11:00	09:00	08:00	10:00						11:00
Volume	3	6	18	58	70	35	9	2						189
PM Volumes	3	19	175	497	604	318	61	13	3	0	0	0	0	1693
% PM	0%	1%	7%	20%	24%	13%	2%	1%	0%					67%
PM Peak Hour	15:00	12:00	17:00	17:00	16:00	16:00	18:00	14:00	17:00					16:00
Volume	1	4	35	73	102	51	13	2	1					250
Directional Peak Periods All Speeds			AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
			Volume		%	Volume		%	Volume		%	Volume		%
			280	↔	11%	326	↔	13%	480	↔	19%	1431	↔	57%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	98th
Nellie Gail Rd	Summary	26	31	31	37	40	29

SPEED

4.1.b

Nellie Gail Rd Bet. Empty Saddle Dr & Oso Pkwy

Day: Friday

City: Laguna Hills

Date: 10/30/2020

Project #: CA20_010022_010

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2
02:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2
03:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
04:00	0	0	0	5	1	0	0	0	0	0	0	0	0	6
05:00	0	0	1	6	11	2	1	0	0	0	0	0	0	21
06:00	0	2	2	13	20	4	3	0	0	0	0	0	0	44
07:00	0	1	6	30	32	26	5	0	0	0	0	0	0	100
08:00	0	3	7	46	52	30	4	0	0	0	0	0	0	142
09:00	0	6	8	32	47	28	14	3	0	0	0	0	0	138
10:00	1	8	11	38	38	34	8	5	0	0	0	0	0	143
11:00	1	3	15	53	51	24	6	5	0	0	0	0	0	158
12:00 PM	0	8	13	53	42	40	5	2	0	0	0	0	0	163
13:00	0	2	16	24	53	34	11	1	0	0	0	0	0	141
14:00	1	5	14	47	61	33	7	3	0	0	0	0	0	171
15:00	0	2	21	51	73	43	11	0	0	0	0	0	0	201
16:00	0	0	13	57	82	29	6	2	1	0	0	0	0	190
17:00	0	5	12	45	64	45	12	1	0	1	0	0	0	185
18:00	1	3	14	41	63	29	7	1	0	0	0	0	0	159
19:00	0	5	16	43	45	33	5	0	1	0	0	0	0	148
20:00	1	0	8	22	31	13	4	1	2	0	0	0	0	82
21:00	0	1	6	17	15	7	2	0	0	0	0	0	0	48
22:00	0	0	1	6	13	10	2	1	0	1	0	0	0	34
23:00	0	0	2	8	8	6	4	1	1	0	0	0	0	30
Totals	5	54	186	640	804	470	117	26	5	2				2309
% of Totals	0%	2%	8%	28%	35%	20%	5%	1%	0%	0%				100%

AM Volumes	2	23	50	226	254	148	41	13	0	0	0	0	0	757
% AM	0%	1%	2%	10%	11%	6%	2%	1%						33%
AM Peak Hour	10:00	10:00	11:00	11:00	08:00	10:00	09:00	10:00						11:00
Volume	1	8	15	53	52	34	14	5						158
PM Volumes	3	31	136	414	550	322	76	13	5	2	0	0	0	1552
% PM	0%	1%	6%	18%	24%	14%	3%	1%	0%	0%				67%
PM Peak Hour	14:00	12:00	15:00	16:00	16:00	17:00	17:00	14:00	20:00	17:00				15:00
Volume	1	8	21	57	82	45	12	3	2	1				201
Directional Peak Periods All Speeds			AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
			Volume		%	Volume		%	Volume		%	Volume		%
			242	↔	10%	304	↔	13%	375	↔	16%	1388	↔	60%

Street Name	Direction	Percentiles					ADT
		15th	50th	Average	85th	95th	
Nellie Gail Rd	Summary	26	32	32	38	41	23

SPEED

Nellie Gail Rd Bet. Empty Saddle Dr & Oso Pkwy

4.1.b

Day: Saturday

Date: 10/31/2020

City: Laguna Hills

Project #: CA20_010022_010

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	0	2	2	2	1	0	0	0	0	0	0	7
01:00	0	0	2	2	0	0	0	0	0	0	0	0	0	4
02:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1
03:00	0	0	0	1	1	0	0	0	0	0	0	0	0	2
04:00	0	0	0	1	0	0	0	0	0	0	0	0	0	1
05:00	0	0	2	1	5	3	0	0	0	0	0	0	0	11
06:00	1	1	4	6	19	5	4	0	0	0	0	0	0	40
07:00	0	1	6	18	33	17	3	0	0	0	0	0	0	78
08:00	0	2	13	35	33	11	2	2	0	0	0	0	0	98
09:00	2	4	13	37	45	21	5	3	0	0	0	0	0	130
10:00	1	5	11	48	42	23	6	3	1	0	0	0	0	140
11:00	0	3	20	38	62	30	9	1	0	0	0	0	0	163
12:00 PM	0	4	16	47	66	36	5	1	0	0	0	0	0	175
13:00	0	2	7	36	53	27	13	1	0	0	0	0	0	139
14:00	1	5	14	44	53	18	6	0	0	0	0	0	0	141
15:00	0	3	11	49	60	22	7	0	1	0	0	0	0	153
16:00	2	6	8	57	56	24	9	1	0	0	0	0	0	163
17:00	0	1	19	47	61	27	8	3	0	0	0	0	0	166
18:00	0	4	18	49	52	28	8	1	1	0	0	0	0	161
19:00	1	5	25	52	47	22	4	1	0	0	0	0	0	157
20:00	1	4	12	43	31	10	2	1	1	0	0	0	0	105
21:00	1	5	4	17	33	13	4	0	0	0	0	0	0	77
22:00	0	1	3	15	31	6	6	2	0	0	0	0	0	64
23:00	0	2	3	12	9	7	2	0	0	0	0	0	0	35
Totals	10	58	211	657	794	353	104	20	4					2211
% of Totals	0%	3%	10%	30%	36%	16%	5%	1%	0%					100%

AM Volumes	4	16	71	189	242	113	30	9	1	0	0	0	0	675
% AM	0%	1%	3%	9%	11%	5%	1%	0%	0%					31%
AM Peak Hour	09:00	10:00	11:00	10:00	11:00	11:00	11:00	09:00	10:00					11:00
Volume	2	5	20	48	62	30	9	3	1					163
PM Volumes	6	42	140	468	552	240	74	11	3	0	0	0	0	1536
% PM	0%	2%	6%	21%	25%	11%	3%	0%	0%					69%
PM Peak Hour	16:00	16:00	19:00	16:00	12:00	12:00	13:00	17:00	15:00					12:00
Volume	2	6	25	57	66	36	13	3	1					175
Directional Peak Periods			AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
All Speeds			Volume		%	Volume		%	Volume		%	Volume		%
			176	↔	8%	314	↔	14%	329	↔	15%	1392	↔	63%

Street Name	Direction	Percentiles					
		15th	50th	Average	85th	95th	98th
Nellie Gail Rd	Summary	25	31	31	37	41	22

SPEED

Nellie Gail Rd Bet. Empty Saddle Dr & Oso Pkwy

4.1.b

Day: Sunday

Date: 11/1/2020

City: Laguna Hills

Project #: CA20_010022_010

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	2	10	3	2	0	1	0	0	0	0	0	18
01:00	0	0	1	3	2	2	2	1	0	0	0	0	0	11
02:00	0	0	0	3	4	0	0	0	0	0	0	0	0	7
03:00	0	0	0	2	1	0	0	0	0	0	0	0	0	3
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	1	1	2	2	0	0	0	0	0	0	0	6
06:00	0	0	0	3	8	4	1	0	0	0	0	0	0	16
07:00	0	0	8	8	15	9	0	0	0	0	0	0	0	40
08:00	0	1	4	13	21	12	4	0	0	0	0	0	0	55
09:00	0	1	16	29	37	17	11	3	0	0	0	0	0	114
10:00	0	1	5	30	31	15	6	0	0	0	0	0	0	88
11:00	1	3	8	40	38	20	7	1	1	0	0	0	0	119
12:00 PM	0	4	12	37	46	25	9	2	0	0	0	0	0	135
13:00	2	2	9	33	43	18	3	0	0	0	0	0	0	110
14:00	0	4	12	26	48	29	6	0	0	0	0	0	0	125
15:00	1	5	19	35	41	22	6	1	0	0	0	0	0	130
16:00	1	3	14	54	33	13	8	1	0	0	0	0	0	127
17:00	1	1	14	29	39	23	5	1	0	0	0	0	0	113
18:00	0	1	6	26	29	23	4	0	0	0	0	0	0	89
19:00	1	1	5	13	25	9	6	1	0	0	0	0	0	61
20:00	0	0	8	11	20	8	3	0	1	0	0	0	0	51
21:00	0	1	1	6	7	7	2	1	0	0	0	0	0	25
22:00	0	0	2	1	7	3	3	2	0	0	0	0	0	18
23:00	0	0	0	2	3	0	1	0	0	0	0	0	0	6
Totals	7	28	147	415	503	263	87	15	2					1467
% of Totals	0%	2%	10%	28%	34%	18%	6%	1%	0%					100%

AM Volumes	1	6	45	142	162	83	31	6	1	0	0	0	0	477
% AM	0%	0%	3%	10%	11%	6%	2%	0%	0%					33%
AM Peak Hour	11:00	11:00	09:00	11:00	11:00	11:00	09:00	09:00	11:00					11:00
Volume	1	3	16	40	38	20	11	3	1					119
PM Volumes	6	22	102	273	341	180	56	9	1	0	0	0	0	990
% PM	0%	1%	7%	19%	23%	12%	4%	1%	0%					67%
PM Peak Hour	13:00	15:00	15:00	16:00	14:00	14:00	12:00	12:00	20:00					12:00
Volume	2	5	19	54	48	29	9	2	1					135
Directional Peak Periods All Speeds			AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
			Volume		%	Volume		%	Volume		%	Volume		%
			95	↔	6%	245	↔	17%	240	↔	16%	887	↔	60%

Street Name	Direction	Percentiles				
		15th	50th	Average	85th	95th
Nellie Gail Rd	Summary	25	31	31	38	42

SPEED

Nellie Gail Rd Bet. Empty Saddle Dr & Oso Pkwy

4.1.b

Day: Monday

Date: 11/2/2020

City: Laguna Hills

Project #: CA20_010022_010

Summary

Time	< 15	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 +	Total
00:00 AM	0	0	0	1	2	1	1	1	0	0	0	0	0	6
01:00	0	0	1	2	0	0	0	0	0	0	0	0	0	3
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	3	0	0	0	0	0	0	0	0	0	3
05:00	0	1	1	1	5	1	0	0	0	0	0	0	0	9
06:00	0	1	2	12	20	7	2	0	0	0	0	0	0	44
07:00	0	1	7	23	38	16	4	0	0	0	0	0	0	89
08:00	0	1	11	41	52	22	5	0	0	0	0	0	0	132
09:00	0	2	11	34	54	29	9	1	0	0	0	0	0	140
10:00	1	4	10	35	56	32	7	4	0	0	0	0	0	149
11:00	1	4	8	40	40	18	3	2	0	0	0	0	0	116
12:00 PM	0	5	18	51	55	31	5	1	0	0	0	0	0	166
13:00	1	3	9	35	59	26	5	6	0	0	0	0	0	144
14:00	0	4	22	37	49	28	4	0	0	0	0	0	0	144
15:00	0	1	19	54	57	27	1	0	1	0	0	0	0	160
16:00	0	4	18	54	83	35	5	1	0	0	0	0	0	200
17:00	0	1	17	66	90	42	11	1	0	0	0	0	0	228
18:00	0	1	15	54	53	26	7	0	0	0	0	0	0	156
19:00	0	0	15	35	34	12	5	1	0	0	0	0	0	102
20:00	0	1	9	39	25	10	4	0	1	0	0	0	0	89
21:00	0	0	3	15	12	10	1	0	1	0	0	0	0	42
22:00	0	1	3	6	6	1	1	1	0	0	0	0	0	19
23:00	0	0	0	5	1	2	2	0	0	0	0	0	0	10
Totals	3	35	199	643	792	376	82	19	3					2152
% of Totals	0%	2%	9%	30%	37%	17%	4%	1%	0%					100%

AM Volumes	2	14	51	192	268	126	31	8	0	0	0	0	0	692
% AM	0%	1%	2%	9%	12%	6%	1%	0%						32%
AM Peak Hour	10:00	10:00	08:00	08:00	10:00	10:00	09:00	10:00						10:00
Volume	1	4	11	41	56	32	9	4						149
PM Volumes	1	21	148	451	524	250	51	11	3	0	0	0	0	1460
% PM	0%	1%	7%	21%	24%	12%	2%	1%	0%					68%
PM Peak Hour	13:00	12:00	14:00	17:00	17:00	17:00	17:00	13:00	15:00					17:00
Volume	1	5	22	66	90	42	11	6	1					228
Directional Peak Periods All Speeds			AM 7-9			NOON 12-2			PM 4-6			Off Peak Volumes		
			Volume	%	Volume	%	Volume	%	Volume	%	Volume	%		
			221	↔ 10%	310	↔ 14%	428	↔ 20%	1193	↔ 55%				

Street Name	Direction	Percentiles				
		15th	50th	Average	85th	95th
Nellie Gail Rd	Summary	26	31	31	37	40

APPENDIX C

SPOT SPEED RADAR SURVEY DATA

Spot Speed Study

Prepared by: National Data & Surveying Services

City of Laguna Hills

DATE: 10/29/2020

Location: Nellie Gail Rd 470' S/O Oso Pkwy

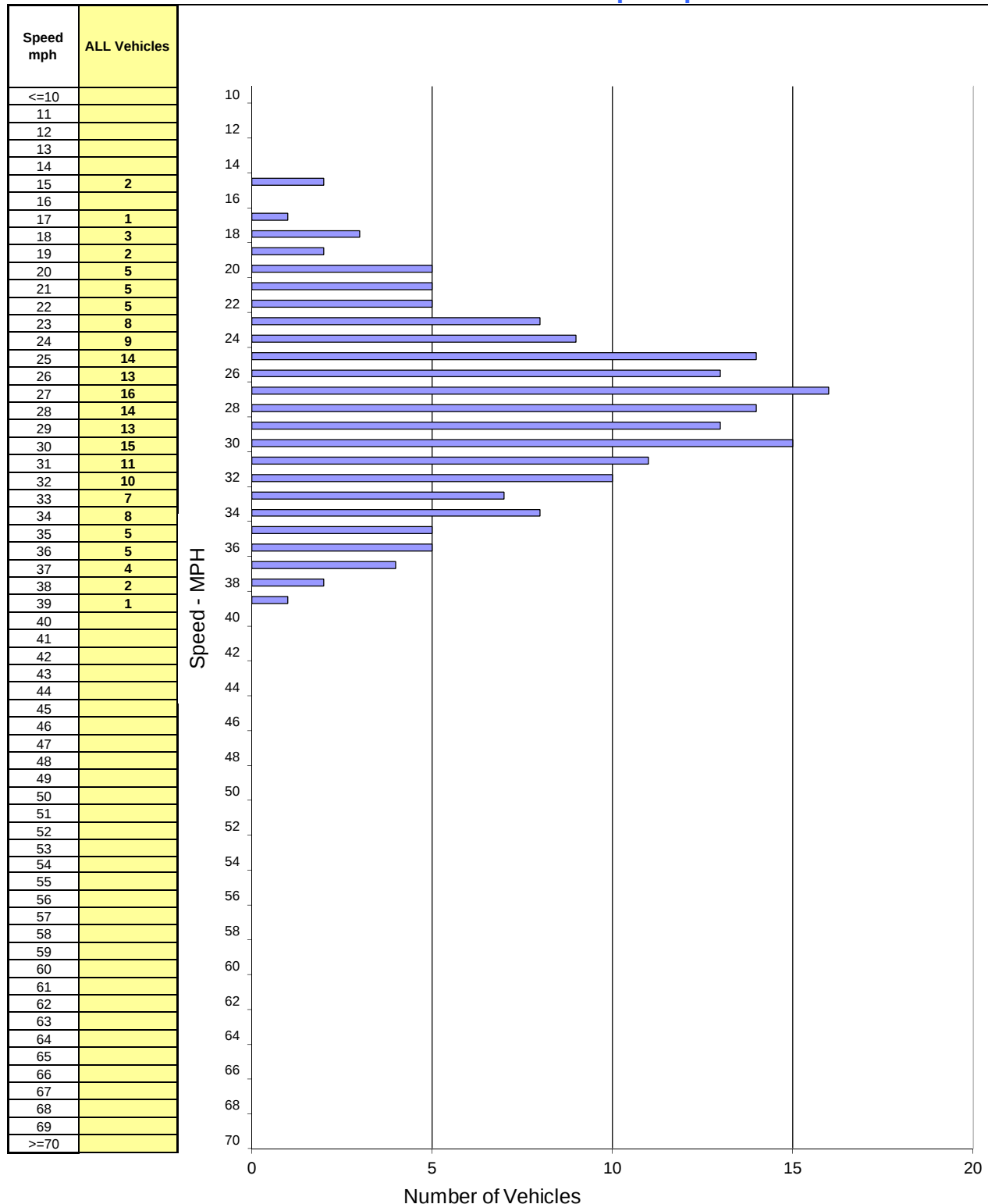
TIME: 11:00-12:00

Posted Speed: 25 MPH

Clear/Dry

Project #: 20-010023-001

Northbound & Southbound Spot Speeds



SPEED PARAMETERS									
Class	Count	Range	50th Percentile	85th Percentile	10 MPH Pace	# in Pace	Percent in Pace	% / # Below Pace	% / # Above Pace
ALL	178	15 - 39	28 mph	33 mph	23 - 32	123	69%	12% / 23	18% / 32

Spot Speed Study

Prepared by: National Data & Surveying Services

City of Laguna Hills

DATE: 10/29/2020

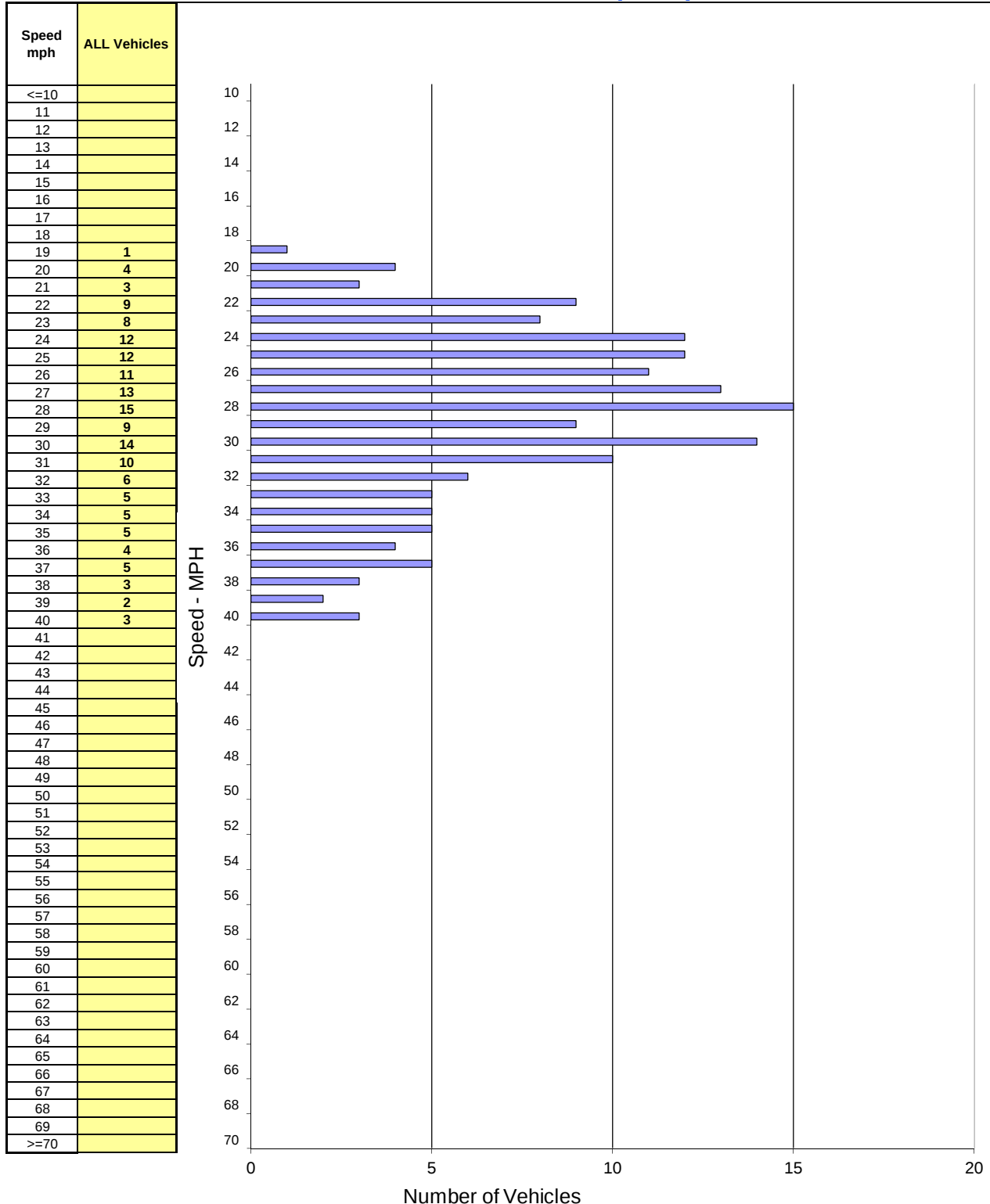
TIME: 12:30-13:30

Location: Nellie Gail Rd Bet., north of Empty Saddle, just south of raised median)

Posted Speed: 25 MPH Clear/Dry

Project #: 20-010023-002

Northbound & Southbound Spot Speeds



SPEED PARAMETERS									
Class	Count	Range	50th Percentile	85th Percentile	10 MPH Pace	# in Pace	Percent in Pace	% / # Below Pace	% / # Above Pace
ALL	159	19 - 40	28 mph	34 mph	22 - 31	113	71%	5% / 8	24% / 38

Spot Speed Study

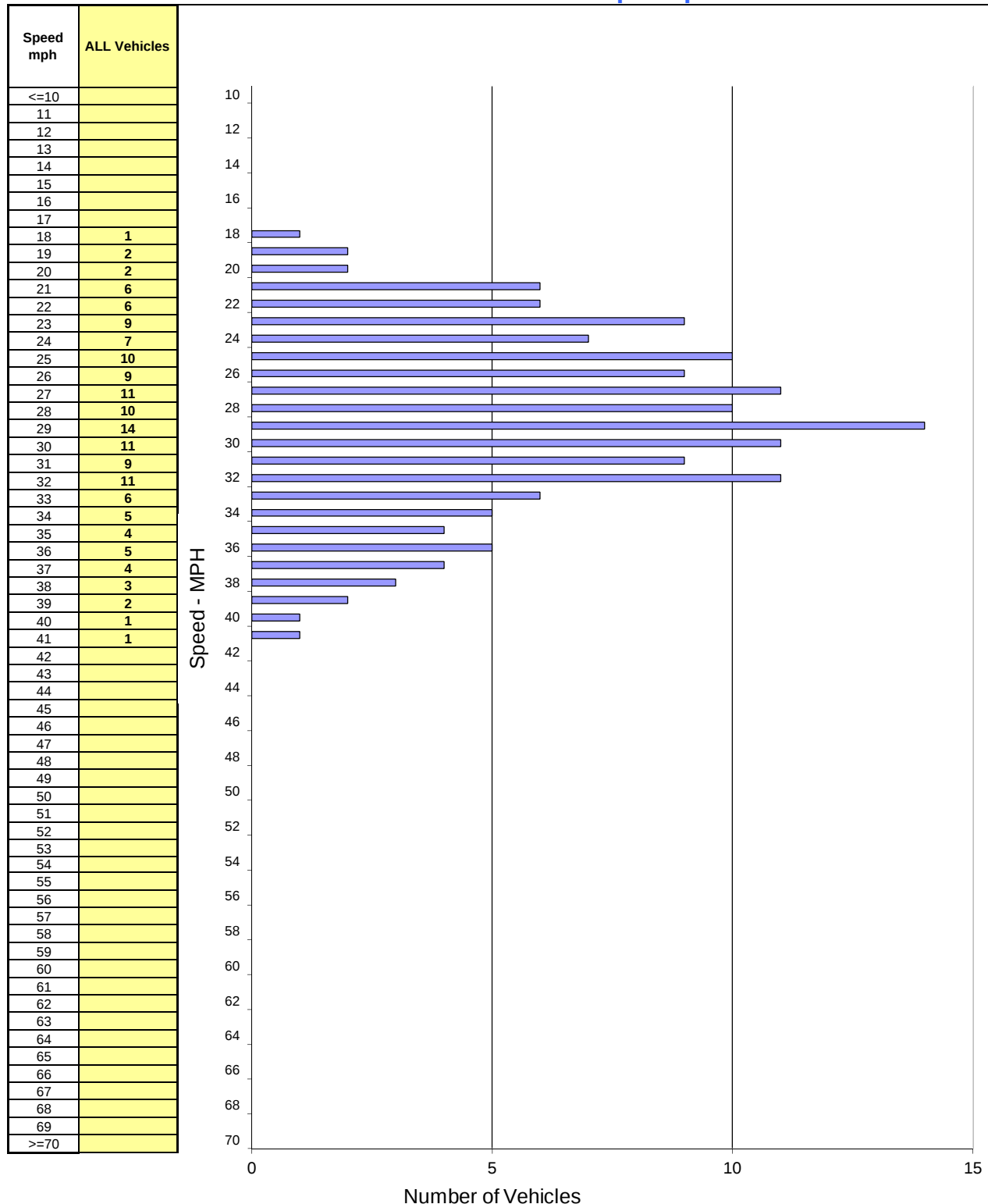
Prepared by: National Data & Surveying Services

City of Laguna Hills

DATE: 10/29/2020
TIME: 14:00-15:00

Location: Nellie Gail Rd Bet. Hidden Trail Rd & Empty Saddle Dr
Posted Speed: 25 MPH Clear/Dry Project #: 20-010023-003

Northbound & Southbound Spot Speeds



SPEED PARAMETERS									
Class	Count	Range	50th Percentile	85th Percentile	10 MPH Pace	# in Pace	Percent in Pace	% / # Below Pace	% / # Above Pace
ALL	149	18 - 41	29 mph	34 mph	23 - 32	101	68%	11% / 17	21% / 31

FOLLOW-UP RADAR SPEED DATA

APRIL 27, 2021

Spot Speed Study

Prepared by: National Data & Surveying Services

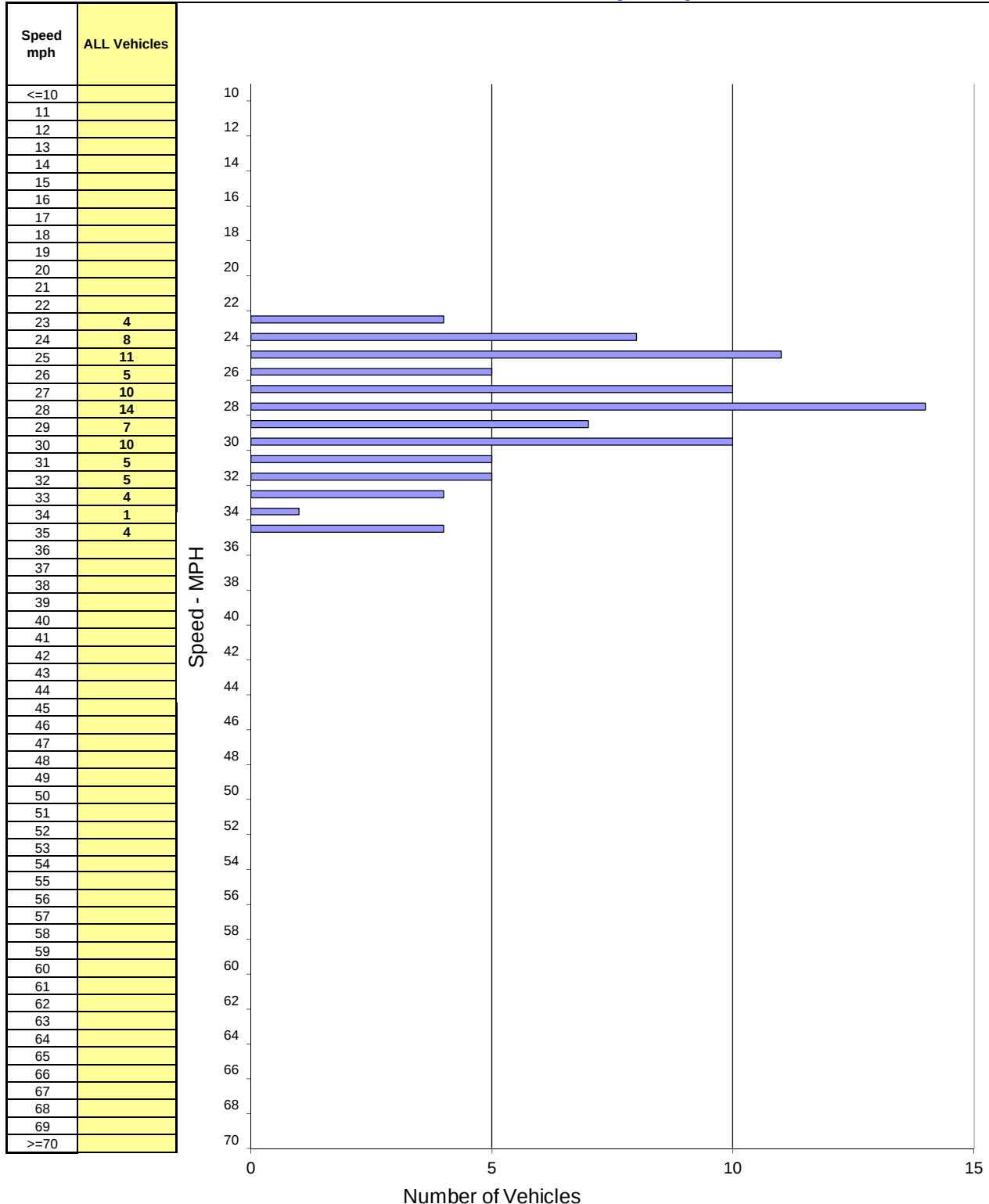
City of Laguna Hills

DATE: 4/27/2021
TIME: 12:00-13:00

Location: Nellie Gail Rd 300' S/O Oso Pkwy
Posted Speed: 25 MPH Clear/Dry

Project #: 21-010037-001

Northbound & Southbound Spot Speeds



SPEED PARAMETERS									
Class	Count	Range	50th Percentile	85th Percentile	10 MPH Pace	# in Pace	Percent in Pace	% / # Below Pace	% / # Above Pace
ALL	88	23 - 35	28 mph	32 mph	23 - 32	79	90%	0% / 0	11% / 9

Spot Speed Study

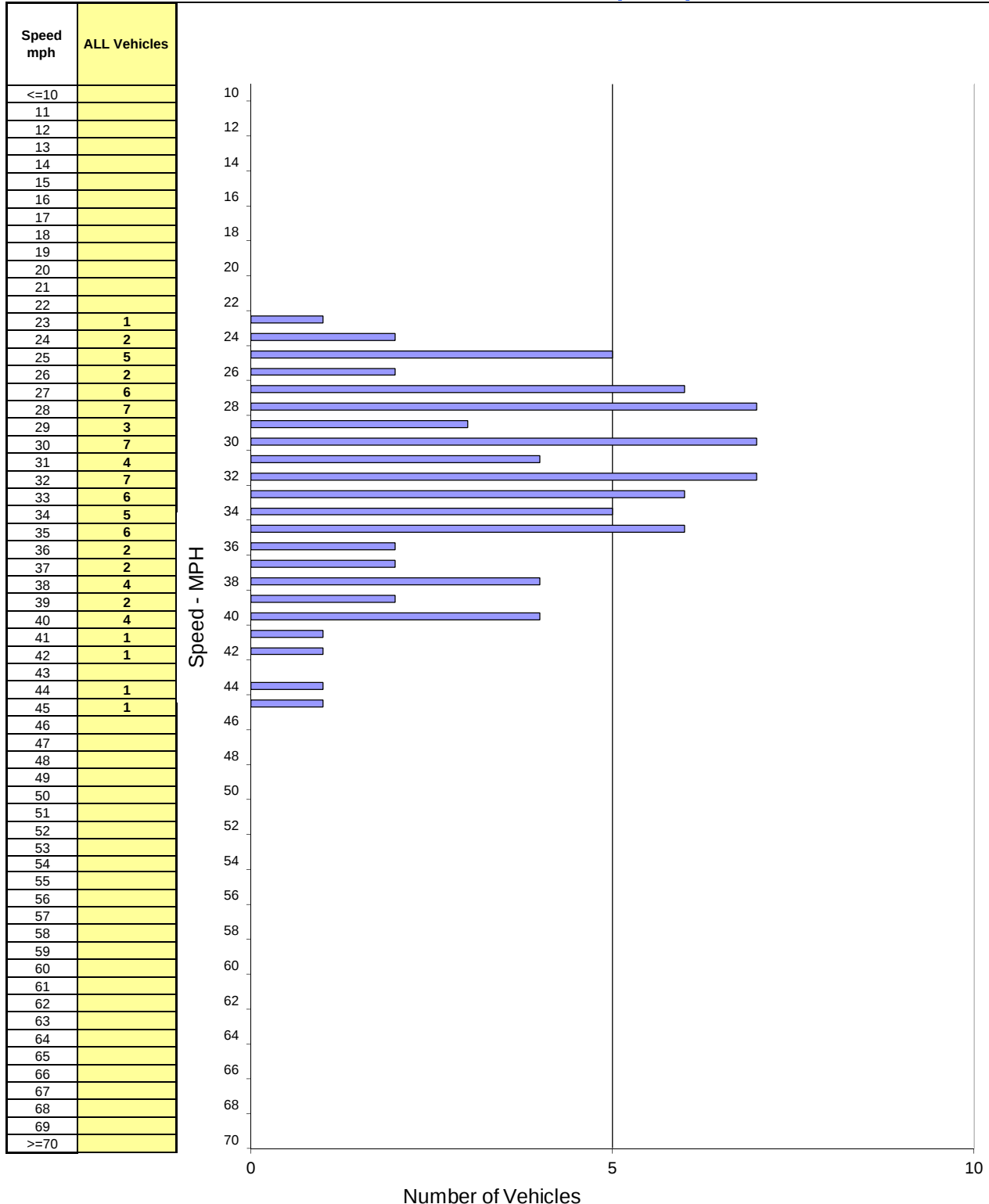
Prepared by: National Data & Surveying Services

City of Laguna Hills

DATE: 4/27/2021
TIME: 11:00-12:00

Location: Nellie Gail Rd 300' N/O Empty Saddle Dr
Posted Speed: 25 MPH Clear/Dry Project #: 21-010037-002

Northbound & Southbound Spot Speeds



SPEED PARAMETERS									
Class	Count	Range	50th Percentile	85th Percentile	10 MPH Pace	# in Pace	Percent in Pace	% / # Below Pace	% / # Above Pace
ALL	79	23 - 45	32 mph	38 mph	26 - 35	53	67%	10% / 8	23% / 18

Spot Speed Study

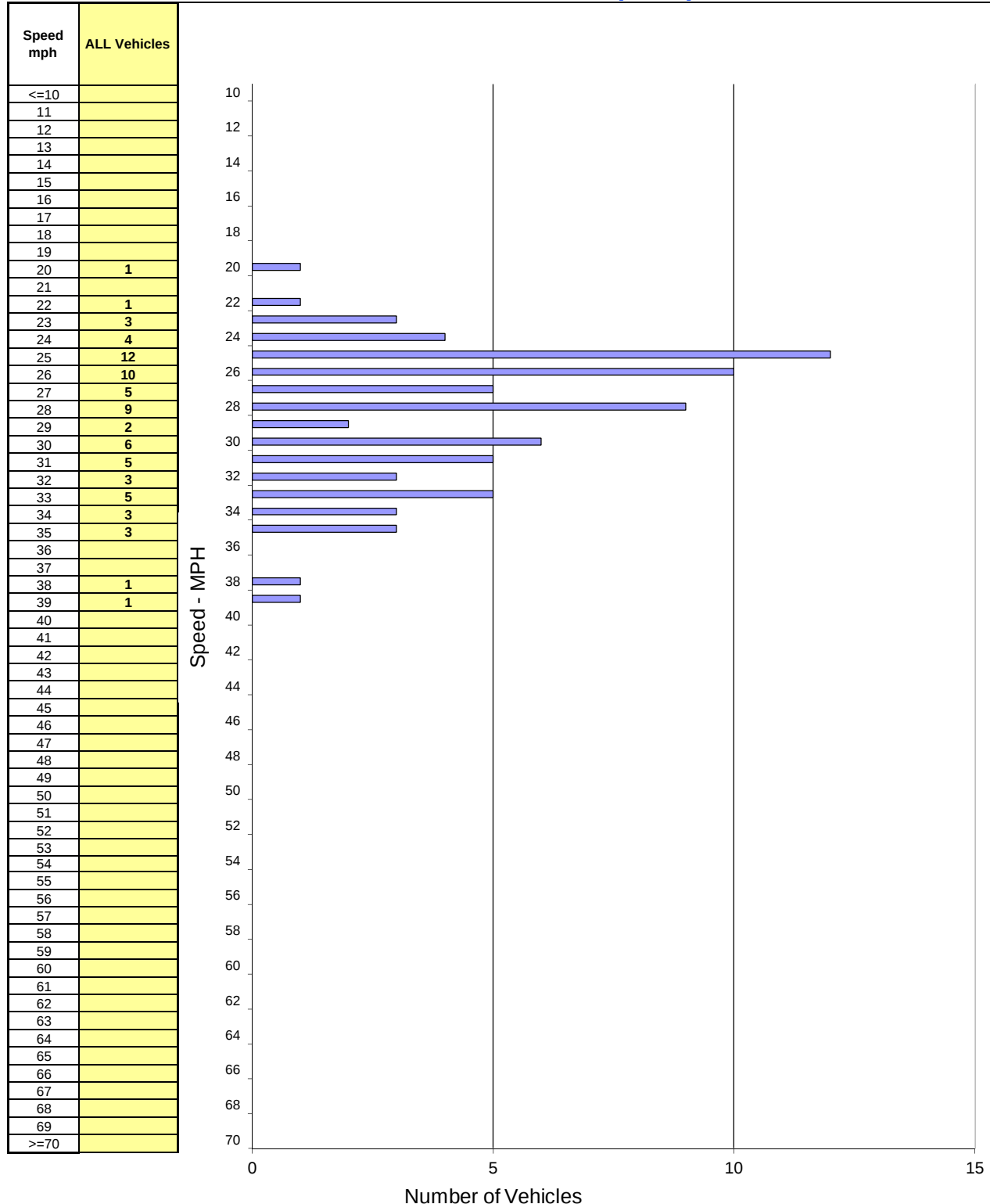
Prepared by: National Data & Surveying Services

City of Laguna Hills

DATE: 4/27/2021
TIME: 10:00-11:00

Location: Nellie Gail Rd 200' S/O Empty Saddle Dr
Posted Speed: 25 MPH Clear/Dry Project #: 21-010037-003

Northbound & Southbound Spot Speeds



SPEED PARAMETERS									
Class	Count	Range	50th Percentile	85th Percentile	10 MPH Pace	# in Pace	Percent in Pace	% / # Below Pace	% / # Above Pace
ALL	74	20 - 39	28 mph	33 mph	24 - 33	61	82%	6% / 5	11% / 8

FOLLOW-UP RADAR SPEED DATA

APRIL 29, 2021

Spot Speed Study

Prepared by: National Data & Surveying Services

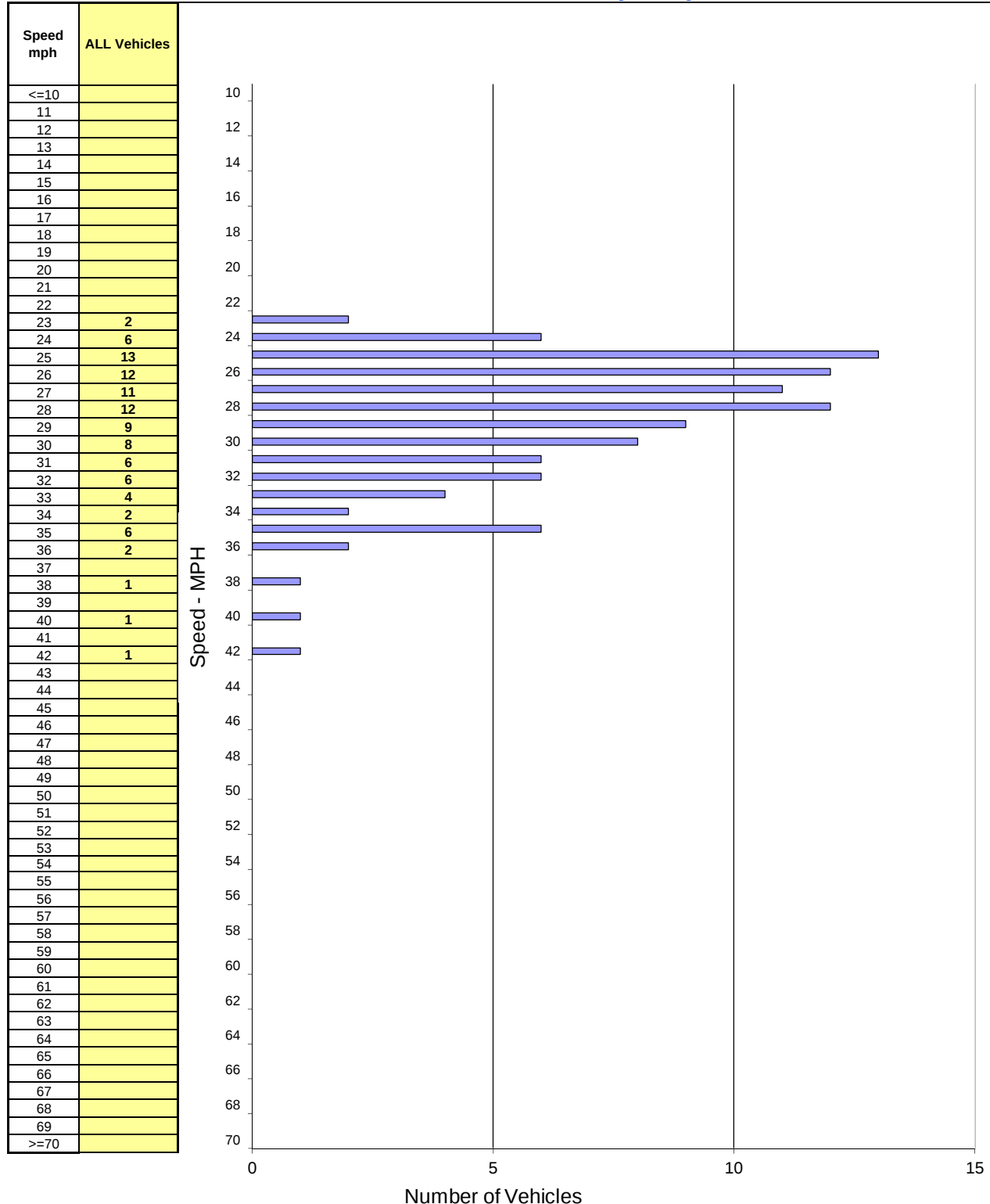
City of Laguna Hills

DATE: 4/29/2021
TIME: 10:30-11:30

Location: Nellie Gail Rd 300' S/O Oso Pkwy
Posted Speed: 25 MPH Clear/Dry

Project #: 21-010037-001

Northbound & Southbound Spot Speeds



SPEED PARAMETERS									
Class	Count	Range	50th Percentile	85th Percentile	10 MPH Pace	# in Pace	Percent in Pace	% / # Below Pace	% / # Above Pace
ALL	102	23 - 42	28 mph	33 mph	24 - 33	87	85%	1% / 2	13% / 13

Spot Speed Study

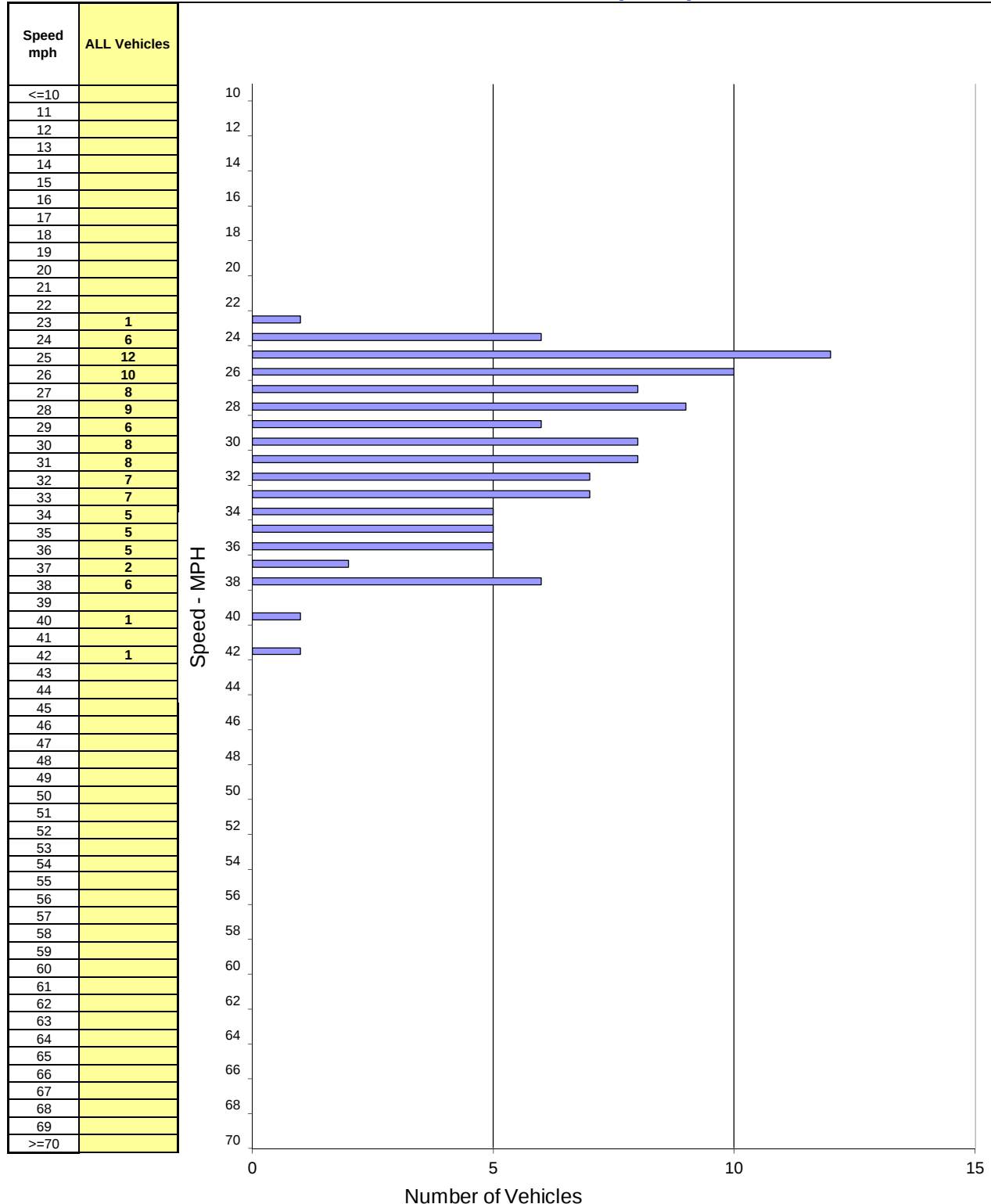
Prepared by: National Data & Surveying Services

City of Laguna Hills

DATE: 4/29/2021
TIME: 11:30-12:30

Location: Nellie Gail Rd 300' N/O Empty Saddle Dr
Posted Speed: 25 MPH Clear/Dry Project #: 21-010037-002

Northbound & Southbound Spot Speeds



SPEED PARAMETERS									
Class	Count	Range	50th Percentile	85th Percentile	10 MPH Pace	# in Pace	Percent in Pace	% / # Below Pace	% / # Above Pace
ALL	107	23 - 42	30 mph	35 mph	24 - 33	81	76%	0% / 1	24% / 25

Spot Speed Study

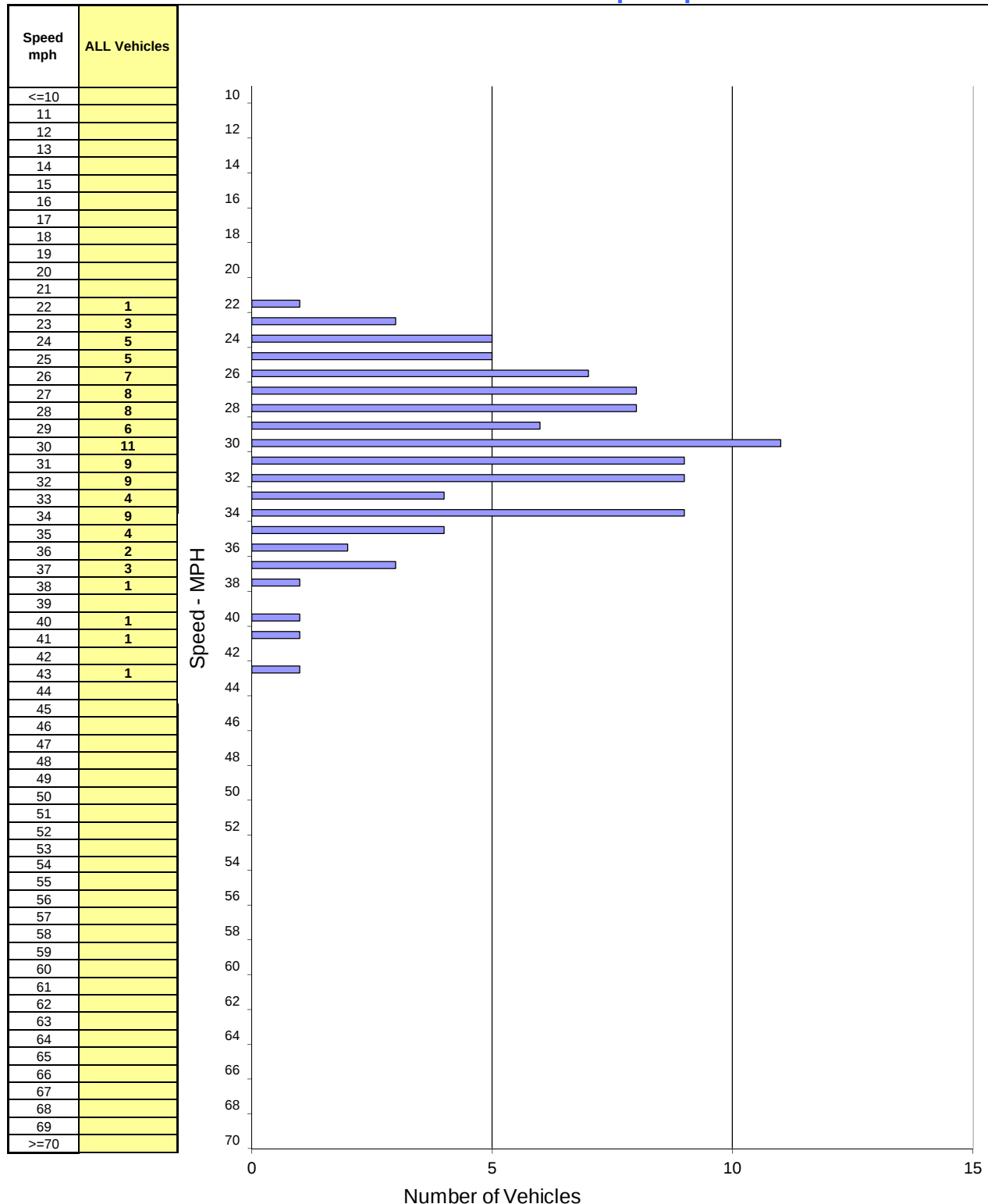
Prepared by: National Data & Surveying Services

City of Laguna Hills

DATE: 4/29/2021
TIME: 12:30-13:30

Location: Nellie Gail Rd 200' S/O Empty Saddle Dr
Posted Speed: 25 MPH Clear/Dry Project #: 21-010037-003

Northbound & Southbound Spot Speeds



SPEED PARAMETERS									
Class	Count	Range	50th Percentile	85th Percentile	10 MPH Pace	# in Pace	Percent in Pace	% / # Below Pace	% / # Above Pace
ALL	98	22 - 43	30 mph	34 mph	25 - 34	76	78%	9% / 9	14% / 13

APPENDIX D

STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED

CALIFORNIA MUTCD

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

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

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

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

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

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

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

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

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

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

Note: Use Table 6C-4 to calculate L

APPENDIX E

CHAPTER 4N. IN-ROADWAY LIGHTS

CALIFORNIA MUTCD

CHAPTER 4N. IN-ROADWAY LIGHTS

Section 4N.01 Application of In-Roadway Lights

Support:

⁰¹ In-Roadway Lights are special types of highway traffic signals installed in the roadway surface to warn road users that they are approaching a condition on or adjacent to the roadway that might not be readily apparent and might require the road users to slow down and/or come to a stop. This includes situations warning of marked school crosswalks, marked midblock crosswalks, marked crosswalks on uncontrolled approaches, marked crosswalks in advance of roundabouts as described in Chapter 3C, and other roadway situations involving pedestrian crossings.

Standard:

⁰² **In-Roadway Lights shall not be used for any application that is not described in this Chapter.**

⁰³ **If used, In-Roadway Lights shall not exceed a height of 3/4 inch above the roadway surface.**

⁰⁴ **When used, In-Roadway Lights shall be flashed and shall not be steadily illuminated.**

Support:

⁰⁵ Steadily illuminated lights installed in the roadway surface are considered to be internally illuminated raised pavement markers (see Section 3B.11).

Option:

⁰⁶ In-Roadway Lights may be flashed in a manner that includes a continuous flash of varying intensity and time duration that is repeated to provide a flickering effect (see Section 4N.02).

Section 4N.02 In-Roadway Warning Lights at Crosswalks

Option:

⁰¹ In-roadway lights may be installed at certain marked crosswalks, based on an engineering study or engineering judgment, to provide additional warning to road users.

Standard:

⁰² **If used, In-Roadway Warning Lights at crosswalks shall be installed only at marked crosswalks with applicable warning signs. They shall not be used at crosswalks controlled by YIELD signs, STOP signs, or traffic control signals.**

⁰³ **If In-Roadway Warning Lights are used at a crosswalk, the following requirements shall apply:**

A. Except as provided in Paragraphs 7 and 8, they shall be installed along both sides of the crosswalk and shall span its entire length.

B. They shall initiate operation based on pedestrian actuation and shall cease operation at a predetermined time after the pedestrian actuation or, with passive detection, after the pedestrian clears the crosswalk.

C. They shall display a flashing yellow light when actuated. The flash rate shall be at least 50, but no more than 60, flash periods per minute. If they are flashed in a manner that includes a continuous flash of varying intensity and time duration that is repeated to provide a flickering effect, the flickers or pulses shall not repeat at a rate that is between 5 and 30 per second to avoid frequencies that might cause seizures.

D. They shall be installed in the area between the outside edge of the crosswalk line and 10 feet from the outside edge of the crosswalk.

E. They shall face away from the crosswalk if unidirectional, or shall face away from and across the crosswalk if bidirectional.

⁰⁴ **If used on one-lane, one-way roadways, a minimum of two In-Roadway Warning Lights shall be installed on the approach side of the crosswalk. If used on two-lane roadways, a minimum of three In-Roadway Warning Lights shall be installed along both sides of the crosswalk. If used on roadways with more than two lanes, a minimum of one In-Roadway Warning Light per lane shall be installed along both sides of the crosswalk.**

Guidance:

05 *If used, In-Roadway Warning Lights should be installed in the center of each travel lane, at the center line of the roadway, at each edge of the roadway or parking lanes, or at other suitable locations away from the normal tire track paths.*

06 *The location of the In-Roadway Warning Lights within the lanes should be based on engineering judgment.*

Option:

07 On one-way streets, In-Roadway Warning Lights may be omitted on the departure side of the crosswalk.

08 Based on engineering judgment, the In-Roadway Warning Lights on the departure side of the crosswalk on the left side of a median may be omitted.

09 Unidirectional In-Roadway Warning Lights installed at crosswalk locations may have an optional, additional yellow light indication in each unit that is visible to pedestrians in the crosswalk to indicate to pedestrians in the crosswalk that the In-Roadway Warning Lights are in fact flashing as they cross the street. These yellow lights may flash with and at the same flash rate as the light module in which each is installed.

Guidance:

10 *If used, the period of operation of the In-Roadway Warning Lights following each actuation should be sufficient to allow a pedestrian crossing in the crosswalk to leave the curb or shoulder and travel at a walking speed of 3.5 feet per second to at least the far side of the traveled way or to a median of sufficient width for pedestrians to wait. Where pedestrians who walk slower than 3.5 feet per second, or pedestrians who use wheelchairs, routinely use the crosswalk, a walking speed of less than 3.5 feet per second should be considered in determining the period of operation.*

Standard:

11 **If pedestrian pushbuttons are used to actuate the in-roadway lights, a Push Button To Turn On Warning Lights (with pushbutton symbol) (R10-25) sign (see Figure 2B-26) shall be mounted adjacent to immediately above or integral with each pedestrian pushbutton.**

12 **Where the period of operation is sufficient only for crossing from a curb or shoulder to a median of sufficient width for pedestrians to wait, median-mounted pedestrian actuators shall be provided.**

13 **In-Roadway Warning Lights (IRWLs) shall not be placed on or within the crosswalk markings. If the In-Roadway Warning Lights are activated by a push button, the PUSH BUTTON FOR PEDESTRIAN WARNING LIGHTS, CROSS WITH CAUTION (R62E(CA)) sign shall be used.**

14 **The following shall be considered when evaluating the need for In-Roadway Warning Lights:**

- A. **Whether the crossing is controlled or uncontrolled.**
- B. **An engineering traffic study to determine if In-Roadway Warning Lights are compatible with the safety and operation of nearby intersections, which may or may not be, controlled by traffic signals or STOP/YIELD signs.**
- C. **Standard traffic signs for crossings and crosswalk pavement markings are provided.**
- D. **At least 40 pedestrians regularly use the crossing during each of any two hours (not necessarily consecutive) during a 24-hour period.**
- E. **The vehicular volume through the crossing exceeds 200 vehicles per hour in urban areas or 140 vehicles per hour in rural areas during peak-hour pedestrian usage.**
- F. **The critical approach speed (85th percentile) is 45 mph or less.**
- G. **In-Roadway Warning Lights are visible to drivers at the minimum stopping sight distance for the posted speed limit.**
- H. **Public education on In-Roadway Warning Lights is conducted for new installations.**

Option:

15 Overhead or roadside Flashing Yellow Beacons may be installed in conjunction with In-Roadway Warning Lights. In-Roadway Warning Lights may be installed independently, but are not necessarily intended to be a substitute for standard flashing beacons. Engineering judgment should be exercised.

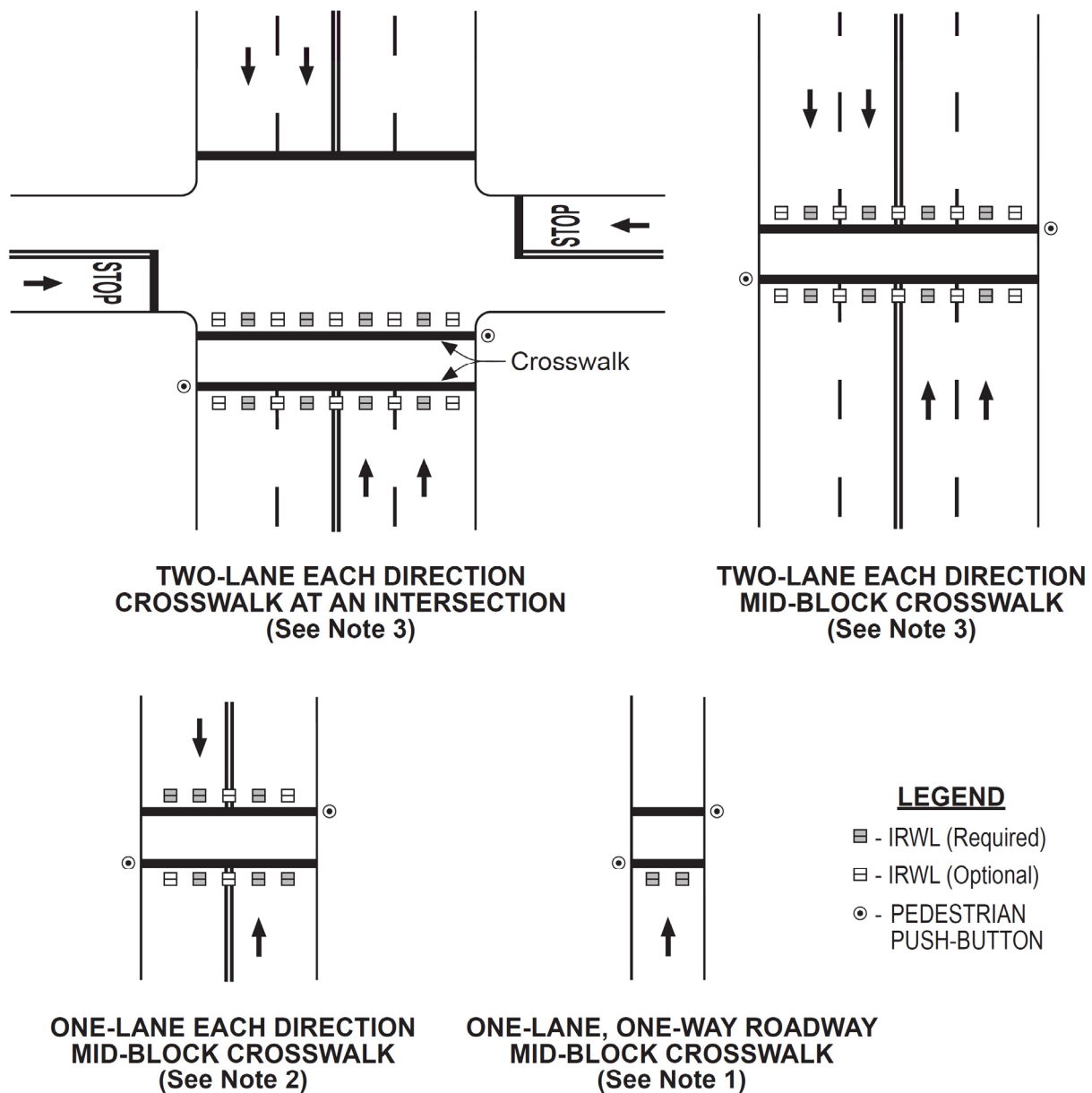
Guidance:

16 *Typical applications of In-Roadway Warning Lights are shown in Figure 4N-101(CA).*

Section 4N.101(CA) In-Roadway Warning Lights at Crosswalks Financing and Maintenance-State Highways Standard:

⁰¹ When In-Roadway Warning Lights are proposed by Caltrans on State highways, Caltrans shall pay the costs of installation and maintenance. When In-Roadway Warning Lights are proposed and installed by a local agency on State highways, the installation of In-Roadway Warning Lights shall be covered by an Encroachment Permit issued by the local Caltrans District Director. The local agency shall be responsible for installation and maintenance of the In-Roadway Warning Lights.

Figure 4N-101 (CA). Typical Layout for In-Roadway Warning Lights (IRWLs)



NOTES:

1. One-Lane, One-Way Roadways, a minimum of two IRWLs shall be installed on the approach side of the crosswalk.
2. One-Lane each direction, a minimum of three IRWLs shall be installed along both sides of the crosswalk.
3. Two-Lanes each direction, a minimum of one IRWLs per lane, shall be installed along both sides of the crosswalk.
4. IRWLs should be located off the tire tracks.

***SATURDAY COUNT DATA
PEDESTRIANS, BICYCLES, AND EQUESTRIANS***

Prepared by National Data & Surveying Services

Crosswalk Study

Location: Nellie Gail Rd Bet. Oso Pkwy & Empty Saddle Dr

Date: 1/9/2021

City: Laguna Hills

Day: Saturday

TIME	VOLUME						TOTAL
	NORTH LEG		SOUTH LEG		EAST LEG		
	Travelling North	Travelling South	Travelling North	Travelling South	Travelling East	Travelling West	
7:00 AM	2	10	2	8	2	0	24
7:15 AM	7	5	7	4	2	1	26
7:30 AM	3	6	4	7	2	2	24
7:45 AM	14	33	14	33	1	1	96
8:00 AM	10	13	10	12	1	0	46
8:15 AM	4	13	5	11	3	0	36
8:30 AM	13	22	15	21	3	0	74
8:45 AM	11	18	11	16	3	1	60
9:00 AM	9	15	8	12	3	1	48
9:15 AM	19	23	18	23	0	1	84
9:30 AM	27	16	27	17	1	2	90
9:45 AM	12	20	12	17	3	0	64
10:00 AM	28	23	28	20	3	0	102
10:15 AM	22	25	18	17	9	5	96
10:30 AM	22	12	23	12	2	1	72
10:45 AM	18	12	17	12	2	3	64
11:00 AM	22	11	22	11	3	3	72
11:15 AM	25	10	25	11	0	1	72
11:30 AM	19	29	18	29	0	1	96
11:45 AM	28	15	30	16	3	2	94
12:00 PM	37	17	35	18	4	7	118
12:15 PM	24	16	20	14	3	5	82
12:30 PM	20	27	16	25	3	5	96
12:45 PM	20	19	18	17	3	3	80
1:00 PM	22	24	18	18	4	2	88
1:15 PM	20	25	18	18	5	0	86
1:30 PM	22	19	19	18	3	5	86
1:45 PM	18	12	18	13	0	1	62
2:00 PM	19	16	17	15	2	3	72
2:15 PM	17	18	16	16	2	1	70
2:30 PM	21	11	18	10	1	3	64
2:45 PM	20	28	17	23	5	3	96
3:00 PM	23	24	18	23	6	10	104
3:15 PM	18	19	16	16	2	1	72
3:30 PM	23	21	19	20	2	5	90
3:45 PM	23	22	24	20	4	1	94
Totals	662	649	621	593	95	80	2700

Prepared by National Data & Surveying Services

Crosswalk Study

Location: Nellie Gail Rd Bet. Oso Pkwy & Empty Saddle Dr

City: Laguna Hills

Date: 1/9/2021

Day: Saturday

TIME	PEDESTRIANS								TOTAL
	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	Travelling East	Travelling West	Travelling East	Travelling West	Travelling North	Travelling South	Travelling North	Travelling South	
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	1	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	2	2	0	0	4
8:15 AM	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	2	0	2
8:45 AM	0	0	0	0	0	0	0	0	0
9:00 AM	1	0	0	0	0	0	0	2	3
9:15 AM	0	0	0	0	1	1	0	0	2
9:30 AM	0	0	1	2	2	0	2	1	8
9:45 AM	0	0	0	0	0	0	0	1	1
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	1	0	0	0	1
10:45 AM	0	0	1	0	2	0	0	3	6
11:00 AM	0	0	0	3	0	0	0	0	3
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	1	2	0	1	0	4
12:00 PM	0	0	0	0	1	0	0	0	1
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	1	0	1
12:45 PM	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	1	0	1	0	2
1:15 PM	0	0	0	0	0	1	0	0	1
1:30 PM	0	0	0	0	0	0	0	1	1
1:45 PM	0	0	0	0	0	0	0	1	1
2:00 PM	0	0	0	0	2	0	0	0	2
2:15 PM	0	0	0	0	1	0	0	0	1
2:30 PM	0	0	0	0	2	0	0	0	2
2:45 PM	0	0	0	0	0	1	0	0	1
3:00 PM	0	0	0	0	0	0	0	0	0
3:15 PM	1	0	1	1	1	0	0	1	5
3:30 PM	0	0	0	0	0	0	1	0	1
3:45 PM	0	2	0	4	4	0	4	0	14
Totals	2	2	3	11	23	5	12	10	68

Prepared by National Data & Surveying Services

Crosswalk Study

Location: Nellie Gail Rd Bet. Oso Pkwy & Empty Saddle Dr

City: Laguna Hills

Date: 1/9/2021

Day: Saturday

TIME	BICYCLES								TOTAL
	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	Travelling East	Travelling West	Travelling East	Travelling West	Travelling North	Travelling South	Travelling North	Travelling South	
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	1	0	0	0	1
9:30 AM	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	1	0	0	1	2
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	2	2
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	1	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0
11:30 AM	1	0	0	0	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	0	4	4
12:00 PM	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0
Totals	1	0	0	0	3	0	0	7	11

Prepared by National Data & Surveying Services

Crosswalk Study

Location: Nellie Gail Rd Bet. Oso Pkwy & Empty Saddle Dr

City: Laguna Hills

Date: 1/9/2021

Day: Saturday

TIME	HORSES								TOTAL
	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	Travelling East	Travelling West	Travelling East	Travelling West	Travelling North	Travelling South	Travelling North	Travelling South	
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	1	0	1
9:45 AM	0	0	0	0	0	0	2	0	2
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	1	1	0	0	1	0	3
10:45 AM	0	0	1	0	0	0	2	3	6
11:00 AM	0	0	1	3	0	0	0	2	6
11:15 AM	0	0	0	1	0	0	2	1	4
11:30 AM	0	0	2	0	0	0	5	0	7
11:45 AM	0	0	2	1	0	0	1	1	5
12:00 PM	0	0	0	2	0	0	2	0	4
12:15 PM	0	0	1	0	0	0	0	0	1
12:30 PM	0	0	1	2	0	0	0	1	4
12:45 PM	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	1	0	0	0	0	0	1
1:45 PM	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	1	0	0	0	0	1	2
2:15 PM	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	1	0	0	0	1	0	2
3:15 PM	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0
Totals	0	0	12	10	0	0	17	9	48



21-010004-001

Yellow arrows are movements
travelling east

Blue arrows are movements
travelling west

East Leg

001

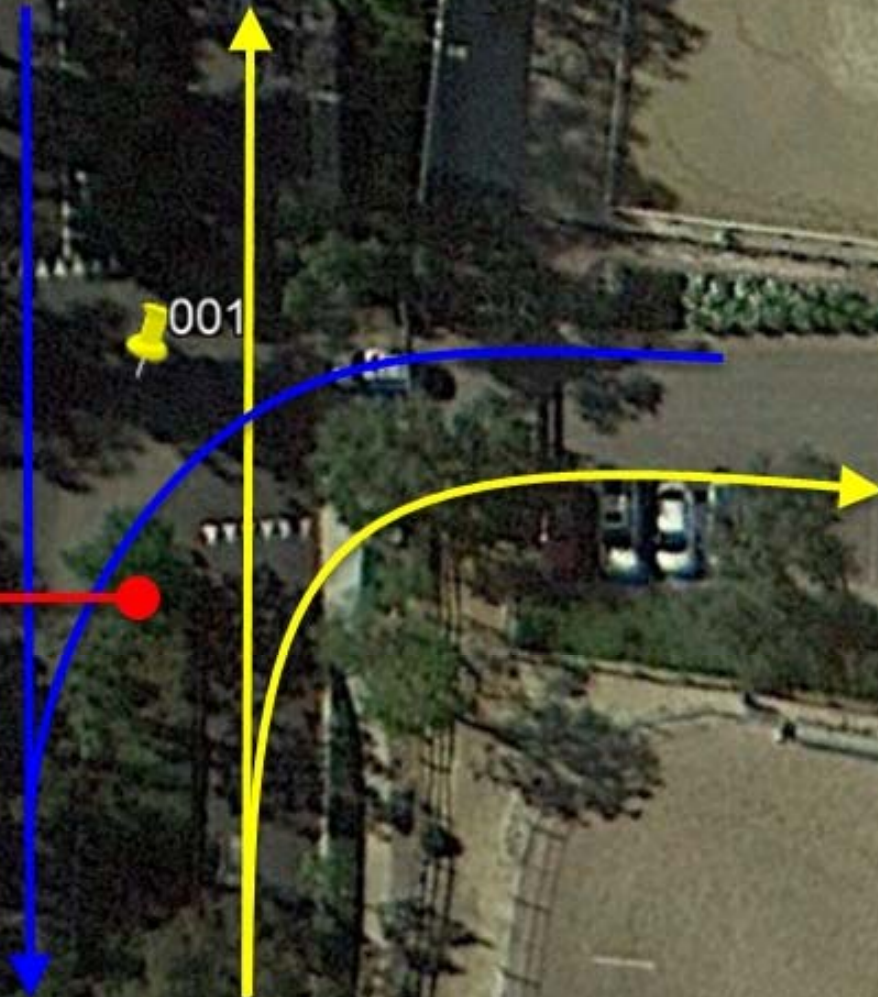


21-010004-001

South Leg

Yellow arrows are movements
travelling north

Blue arrows are movements
travelling south





21-010004-001

North Leg

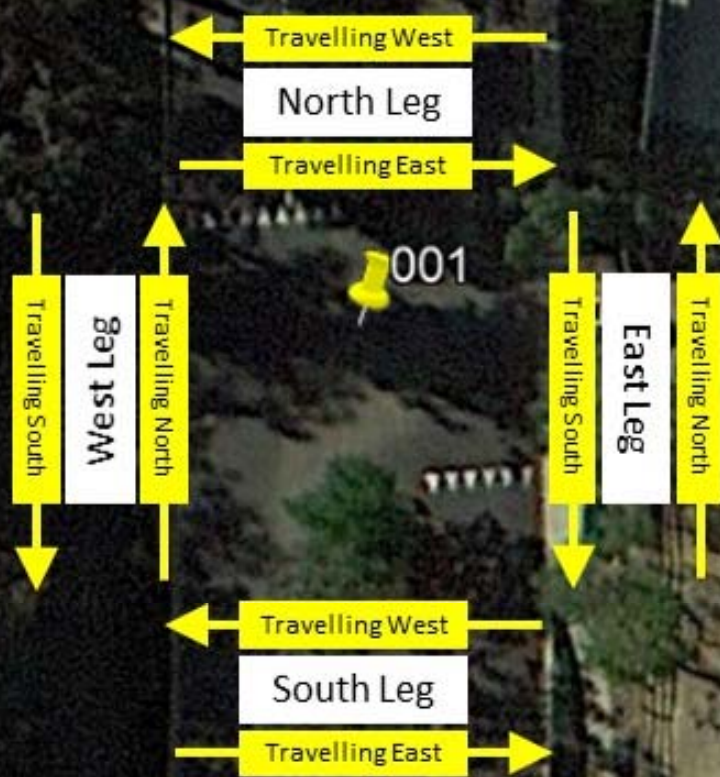
Yellow arrows are movements
travelling north

Blue arrows are movements
travelling south

001

N↑

21-010004-001





City of Laguna Hills

Traffic Commission

Staff Report

DATE: May 19, 2021
TO: Traffic Commissioners
FROM: Amber M. Shah P.E.
Associate Civil Engineer
ISSUE: Radar Speed Trailer

RECOMMENDATION: That the Traffic Commission Receive and File the Report.

ATTACHMENTS:

- Radar Trailer Calendar May and June 2021

CITY OF LAGUNA HILLS

MAY 2021

RADAR TRAILER SCHEDULE (RAINY DAYS EXCLUDED)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4 Hidden Trail Across from 27783 25 MPH	5 Woodbluff W/O Middleridge 25 MPH	6 Bridlewood S/O Laurel Crest 25 MPH	7	8
9	10	11	12	13	14	15
16	17	18 Mustang W/O Appaloosa 25 MPH	19 Rapid Falls W/O Sundowner 25 MPH	20 Nellie Gail E/O Desert Trail 25 MPH	21	22
23	24	25	26	27	28	29
30	31 HOLIDAY					

Attachment: Radar Trailer Calendar May and June 2021 (2444 : Radar Speed Trailer)

CITY OF LAGUNA HILLS

JUNE 2021

RADAR TRAILER SCHEDULE (RAINY DAYS EXCLUDED)

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

Attachment: Radar Trailer Calendar May and June 2021 (2444 : Radar Speed Trailer)