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LLG Reference: 2.19.4219.1

Subject: **Updated Traffic Assessment for the
Proposed Paseo De Colinas 24-DU Residential Development**
Laguna Niguel, California

Dear Mr. Conk,

Linscott, Law & Greenspan, Engineers (LLG) is pleased to submit the findings of this Updated Traffic Assessment associated with the development of a multi-family residential community (herein after referred to as Project) on a 1.50-acre portion of a 2.47-acre parcel of land owned by the Capistrano Unified School District (CUSD) in the City of Laguna Niguel, California. The Project site is a part of the Niguel Hills Middle School Campus and was used to house modular buildings and associated surface parking. The subject property, which is now vacant, is located along the west side of Paseo De Colinas, just northwest of the Del Cerro/Paseo De Colinas intersection and addressed at 29001 Paseo de Colinas.

This revised analysis evaluates the traffic implications associated with an update to the proposed Project's development tabulation and site plan, inclusive of the Project's trip generation potential, a VMT Screening Assessment, and an evaluation of the Project's site access from Paseo De Colinas. This analysis also addresses comments provided by City staff on October 13, 2023 related to the traffic implications associated with pedestrian (student) activity of the nearby Niguel Hills Middle School as well as the potential effect of Project-related traffic on the operating conditions on the key study intersections within the vicinity of the project. The site plan has modified the northernmost project driveway to egress only to address comments by the City provided in January 2024.

In addition, based on discussions during a Planning Commission Workshop conducted in April 2024 supplemental count data was collected and has been included. **Appendix A** includes the Limited Scope LOS Traffic Impact Study

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(TIS) Scope of Work for this Project that was developed in collaboration with City planning and engineering staff

PROJECT LOCATION AND DESCRIPTION

The Project site is a 1.50-acre portion of a 2.47-acre parcel of land owned by the Capistrano Unified School District that is a part of the Niguel Hills Middle School Campus. The remaining 0.97-acre will be offered in dedication to the City of Laguna Niguel as a future park site. The project site was previously visited by LLG to document existing conditions. The Project site, which is now vacant, was previously used for other CUSD uses with modular buildings and associated surface parking (71± parking spaces). Previous CUSD related uses included alternative middle school for grades 7 & 8; independent study program (Fresh Start) for grades 9 – 12; college and career planning center; CUSD Music Department Offices; and home-schooling center (CHOOSE) for grades K – 8. The Project site is located along the west side of Paseo De Colinas, just northwest of the Del Cerro/Paseo De Colinas intersection. Access to the Project site is now provided via an existing unsignalized “right-turn only” driveway that is located midpoint of the site. **Figure 1** presents a Vicinity Map that illustrates the general location of the Project and surrounding street system. **Figure 2** presents the existing aerial of the Project site.

The proposed Paseo De Colinas residential project includes the construction of a 24-unit townhome community consisting of eight (8) two-bedroom/two-bath units, twelve (12) three-bedroom/two and ½ bath units and four (4) four-bedroom/two and ½ bath units within five (5), three-story buildings. Parking for the Project includes 48 garage spaces (2 per unit) and 25 open spaces. **Table 1** summarizes the development totals for the proposed Project.

From review of the proposed site plan, access to the Project site is proposed to be provided via two unsignalized driveways located along Paseo De Colinas. The southernmost project driveway is proposed as a right turn in/out only driveway with the northernmost project driveway proposed as a right turn out (exit only) driveway. The northernmost project driveway will include “project design features” such as curb enhancements and signage that would restrict vehicles from entering via Paseo De Colinas. Vehicular circulation internal to the site will be provided by local drive aisles/streets which measure 24-feet wide. **Figure 3** presents the site plan for the Project, prepared by Fuscoe Engineering, the Project Civil Engineers.

As shown on **Figure 3**, the design of the driveway configuration in combination with the installation of a “STOP” sign and stop bar at Project’s northernmost driveway on Paseo Del Colinas, plus a “No Right Turn (R3-1)” sign facing southbound traffic will deter motorists from entering at this “exit only” driveway.

Additionally, there are two staircases that are adjacent to the Project site that are property of Niguel Hills Middle School (NHMS) and not a part of the proposed Project. Per CUSD, the northern stairs are closed and will remain closed. The southern staircase provided pedestrian (student) connectivity between the school campus and Paseo De Colinas until it was recently closed in June 2024 by Niguel Hills Middle School. It is expected that with this closure, some pedestrian activity associated with the school, inclusive of student drop-off/pick-up, that occurs at the Paseo De Colinas and Del Cerro intersection will be re-routed to the school's main access at Golden Lantern and Shark Bay, via the Paseo De Colinas at Golden Lantern intersections and that some will be re-routed to other nearby public streets which permit parking.

PROJECT TRAFFIC CHARACTERISTICS

Trip Generation Forecast

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation factors and equations used are based on the most current information found in the 11th Edition of *Trip Generation*, published by the Institute of Transportation Engineers (ITE) [Washington, D.C., 2021].

The proposed Project includes a development of five (5) multi-level townhome buildings, as a result the trip generation potential of the Project would either be forecast using trip rates for ITE Land Use 220: Multifamily Housing (Low Rise)¹ or ITE Land Use 221: Multifamily Housing (Mid Rise)². However, to provide a conservative forecast, ITE Land Use 220: Multifamily Housing (Low Rise) trip rates were utilized in this traffic assessment. It should be noted that the trips rates utilized are based on the General Urban/Suburban land use setting.

Table 2, located at the rear of this letter, summarizes the trip generation rates and forecast for the Project. As shown, the proposed Project is forecast to generate 162 weekday daily trips, with 10 trips (2 inbound, 8 outbound) during the weekday AM peak hour and 12 trips (8 inbound, 4 outbound) occurring during the weekday PM peak hour.

Traffic Impact Analysis Requirements

When assessing the need for further analysis at study intersections, a “50 peak hour trip” threshold is applied based on the *City of Laguna Niguel Transportation Assessment Guidelines*. Given the results of the trip generation forecast we conclude that the added Project trips would have minimal impacts and that no additional

¹ Low Rise residential units consist of 1-2 levels.

² Mid Rise residential units consist of 3-10 levels.

analysis is required. Further, given these results, and based on the City’s guidelines, the Project would screen out and should not be required to prepare a traffic impact (Level of Service) analysis.

EXISTING NHMS SOUTHERN STAIRCASE OBSERVATIONS

In response to concerns brought up by City staff related to student drop-off/pick-up activity along Del Cerro at Paseo de Colinas, LLG visited the site and conducted observations to document this activity. During the morning drop-off period from 8:00 AM – 9:00 AM parents would enter Del Cerro, turn around, and park along the curb to drop-off students. Students would then proceed to the signalized intersection of Paseo De Colinas and Del Cerro to use the existing marked crosswalk and eventually make their way to NHMS via the use of the southern staircase. During the drop-off period, as shown in the table below, between 26-30 vehicles were observed to be parked along Del Cerro to drop off their students. Additionally, as shown in the table below, it should be noted that between 41-61 students used the staircase in the morning time which was a combination of students being dropped-off and/or students walking from the nearby residential community.

During the afternoon pick-up period from 3:00 PM – 4:00 PM parents would park along Del Cerro and wait for students to depart NHMS via the southern staircase, utilize the signalized crosswalk at Paseo De Colinas and Del Cerro, and then proceed to enter one of the waiting vehicles. As vehicles would leave, the vehicles at the end of the queue would move forward and take the place of the vehicle that had just departed. During the afternoon pick-up period, as shown in the table below, between 35-66 vehicles were observed to be parked along Del Cerro waiting for students to arrive. Additionally, as shown in the table below, it should be noted that between 84-100 students used the staircase in the afternoon time which was a combination of students being picked-up and/or students walking into the nearby residential community.

	Time Period	Wednesday May 24, 2023	Tuesday May 21, 2024	Wednesday May 22, 2024	Thursday May 23, 2024
Number of Vehicles Parked along Del Cerro	AM Drop-Off	27	29	26	30
	PM Pick-Up	66	44	35	44
Number of Students Utilizing Staircase	AM Drop-Off	52	46	41	61
	PM Pick-Up	100	87	94	84

The potential traffic impact associated with vehicular trips on the operating conditions of the key study intersections that will be rerouted due to the closure of this staircase are analyzed later in this report.

It should be noted that during the morning drop-off and afternoon pick-up periods, vehicles queue onto Shark Bay and Golden Lantern while waiting to drop-off or pick-up their student(s). When on-site queues back up onto Shark Bay, those vehicles queue in the travel lane, but they do not use the bus lane. When queues back up onto Golden Lantern the vehicles wait idling in the curb lane. During both the drop-off and pick-up times vehicles that queued along Shark Bay adhered to the “Keep Clear” pavement legend which allowed residents to enter and exit Via Estudio and Paseo Lomita. Additionally, when residents need to enter during peak drop-off and pick-up times, they are able to do so via the existing bus lane located along Shark Bay to bypass the queue when entering the community. However, this bypass movement using the bus lane was observed to occur infrequently. Due to the infrequency, it can be concluded that the community is aware of the peak congestion times related to the school and generally choose to avoid these times.

Figures 4 and 5 present the number of vehicles queued along Shark Bay and Golden Lantern waiting to enter the school driveway during the morning drop-off period and afternoon pick-up period, respectively. As shown in *Figure 4* with the blue bar, vehicles begin to queue past the Niguel Hills Middle School driveway onto Shark Bay about 30 minutes before the 1st bell rings. During the morning drop-off period, between 20-25 minutes before the bell rings for the school, vehicles begin to queue onto Golden Lantern. However, this queue quickly dissipates 2-3 minutes before the bell rings. During the morning drop-off period there is a peak queue of 10 vehicles along Golden Lantern. It should be noted that Golden Lantern can accommodate up to 21 vehicles. Bicycle observations were also conducted during the morning drop-off period and it was observed that 67 students rode bikes to the school. It should be noted that this number of bicyclists is due to the increased popularity of E-bikes, which has helped in decreasing the vehicular queues during the afternoon school departure period. These bicyclists were able to access the school via sidewalk and are instructed to walk their bikes when on school property and also along Shark Bay during the morning drop-off period. The school has a strict bike policy which allows the school to revoke bike privileges which helps to enforce student conduct with bikes. Observations showed that students did in fact walk their bikes along Shark Bay.

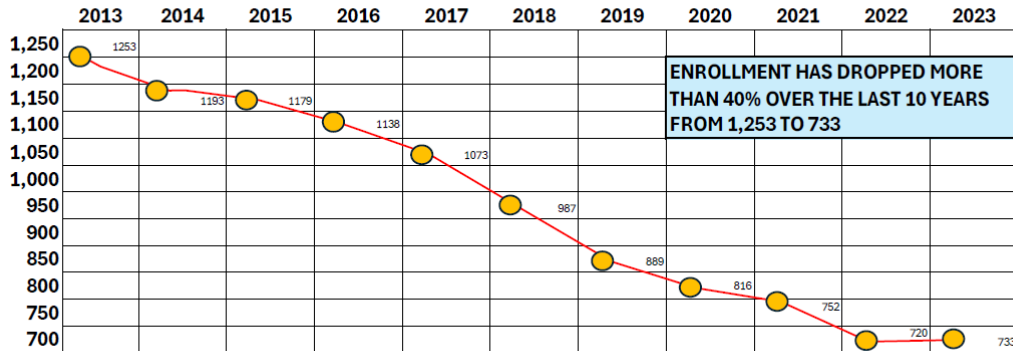
Similarly, as shown in *Figure 5* with the blue bar, vehicles begin to queue past the Niguel Hills Middle School driveway onto Shark Bay about 25 minutes before the dismissal bell rings. During the afternoon pick-up period, in the 20 minutes leading up to the dismissal bell ringing as well as the 8 minutes following the bell, vehicles queue on Golden Lantern. However, this queue dissipates about 8-10 minutes after the bell rings. During the afternoon pick-up period there is a peak queue of 16 vehicles along Golden Lantern. It should be noted that Golden Lantern can

accommodate up to 21 vehicles. Bicycle observations were also conducted during the afternoon pick-up period and it was observed that 68 students rode bikes from the school. These bicyclists were able to access the school via sidewalk and are instructed to walk their bikes when on school property and also along Shark Bay during the afternoon drop-off period. Similar to the morning drop-off period, the school's strict bike policy has resulted in students walking their bikes along Shark Bay as observations would indicate.

Figures 4 and 5 also indicate the number of vehicles that are forecasted to be rerouted from Del Cerro to Shark Bay/Golden Lantern with the closure of the southern staircase during the morning drop-off period and afternoon pick-up period, respectively. As shown in *Figure 4* denoted in orange, during the morning drop-off period, the queue on Shark Bay/Golden Lantern is not forecast to extend to Paseo De Colinas. However, as shown in *Figure 5* denoted in orange, during the afternoon pick-up period, the queue on Shark Bay/Golden Lantern are forecast to exceed the maximum queue capacity of 39 vehicles by 6-13 vehicles, depending on the day of the week. Further review of *Figure 5* shows that the anticipated queue that would extend past Paseo De Colinas would only occur during a brief 6 to 12 minute period and forecast to start as early as 3:14 PM before the afternoon school dismissal at 3:25 PM. This vehicular queue on to Golden Lantern is forecast to dissipate approximately 10 minutes after school dismissal at 3:36 PM. As a result, the afternoon pick-up period could queue onto Paseo De Colinas or continue along Golden Lantern past Paseo De Colinas with rerouted traffic from Del Cerro if current arrival/departure patterns remain the same. However, it is not anticipated that 100% of the previous Del Cerro traffic will re-route to the Shark Bay entrance. Many parents/drivers may continue to utilize neighborhood public streets which permit parking. It should be noted that this would occur during non-commuter times when less traffic is on the roadway.

The graph below displays Niguel Hills Middle School enrollment for the past 10 years. As shown in the graph, enrollment has decreased by more than 40% over the past 10 years. Therefore, it can be concluded that with the closure of the staircase and the rerouted Del Cerro volumes, the traffic conditions along Shark Bay/Golden Lantern would be similar to that of past years with higher enrollment.

NIGUEL HILLS MIDDLE SCHOOL ENROLLMENT HISTORY



Source: Predictive Enrollment Analytics - Capistrano Unified School District - Niguel Hills Middle School

Afternoon congestion on Shark Bay/Golden Lantern is exacerbated by parents arriving at the school as much as 30 minutes prior to school dismissal. To help alleviate congestion from the queue along Shark Bay/Golden Lantern with the closure of the southern staircase, the principal of Niguel Hills Middle School expects to encourage and provide parents with education regarding when to arrive to pick up students and to discourage parents from arriving early and creating an unnecessary queue of vehicles on the adjacent street system to manage the vehicular queues. This strategy is expected to be used by the principal for this coming school year, which starts on August 20, 2024, as the Niguel Hills Middle School southern staircase has already been closed and will continue to be closed during the 2024-2025 school year.

Modifications to the current on-site circulation were considered to increase on-site vehicular queuing capacity, inclusive of the use of the bus lane as supplemental queuing storage after all the buses have arrived. However, the buses that serve NHMS can sometimes run late during the afternoon pick-up period when vehicular queues have already stacked onto Shark Bay. Further, it is a requirement that the bus lane in front of the school must remain clear in case of an emergency. Therefore, the use of the bus lane and bus staging area in front of the school for drop-off and/or pick-up, including after the buses have departed during the afternoon pick-up period, is considered infeasible.

SITE ACCESS EVALUATION

Sight Distance Analysis

In support of evaluating the Project's proposed access on Paseo De Colinas, a sight line assessment was prepared to validate the adequacy of sight lines at the Project's "right-turn only" access driveways as shown in the Project's updated site plan. As noted earlier, access to the Project site is proposed to be provided via two unsignalized driveways located along Paseo De Colinas.

The line of sight evaluation was prepared according to the general engineering practices for stopping sight distance analysis as documented in the State of California Department of Transportation (Caltrans) *Highway Design Manual (HDM)*. This assessment is based on the intersection sight distance requirements, as published in the Caltrans *HDM*, and focuses on the sight distance requirements for the proposed Project driveways located on Paseo De Colinas. The Sight Distance Evaluation prepared for the proposed driveways was based on the criteria and procedures set forth by the California Department of Transportation (Caltrans) in the State's *Highway Design Manual* for "Private Road Intersections".

The *Highway Design Manual (HDM)*, in Section 405.1(2)(c), page 400-27, indicates that for Private Road Intersections, "The minimum corner sight distance shall be equal to the stopping sight distance as given in Table 201.1...", where stopping sight distance is defined as the distance required by the driver of a vehicle, traveling at a given speed, to bring his vehicle to a stop after an object on the road becomes visible. Stopping sight distance is measured from the driver's eyes, which are assumed to be 3.5 feet above the pavement surface, to an object 0.5-foot high on the roadway. The speed used in determining stopping sight distance is defined as the "critical speed" or 85th percentile speed which is the speed at which 85% of the vehicles are traveling at or less. The critical speed is the single most important factor in determining stopping sight distance. Table 201.1 in the HDM is used in determining stopping sight distance based on the critical speed of vehicles on the affected roadway. Paseo De Colinas has a posted speed limit of 45 miles per hour (mph), however, per the City of Laguna Niguel Circulation Element, Paseo De Colinas is classified as a primary arterial highway which typically has a design speed of 55 mph. Therefore, a design speed of 55 mph for Paseo De Colinas has been utilized to provide a conservative assessment.

Using Table 201.1, titled *Sight Distance Standards*, in the State's *HDM* for stopping, a minimum stopping sight distance of 500 feet is required.

To provide a conservative assessment, the "corner sight distance" criteria in Section 405.1(2)(b) of the *HDM* was also utilized. Based on the criteria set forth in Table 405.1A of the *HDM* and a design speed limit of 55 mph on Paseo De Colinas, a corner sight distance of 526 feet is required for the right-turn.

Figures 6 and 7 illustrate a schematic of the sight distance evaluation for project driveways 1 (northerly access) and 2 (southerly access) along Paseo De La Colinas for stopping sight distance and corner sight distance, respectively. The figure illustrates the limited use areas. Review of *Figures 6 and 7* indicates that sight distances at the Project Driveways are expected to be adequate if obstructions within the sight triangles are minimized. Adequate sight lines give the motorist the ability to

see gaps in traffic to help with egress from the site. Due to these sight lines, an acceleration lane is not required.

Internal Circulation Evaluation

The on-site circulation was evaluated in terms of vehicle-pedestrian conflicts. Based on our review of the Project's site plan, the overall layout does not create any unsafe vehicle-pedestrian conflict points and the driveway throating is sufficient such that access to parking spaces is not impacted by internal vehicle queuing/stacking.

Our evaluation of the on-site circulation for the Project was also performed using the *Turning Vehicle Templates*, developed by Jack E. Leisch & Associates and *AutoTURN for AutoCAD* computer software that simulates turning maneuvers for various types of vehicles. A passenger vehicle, trash truck, and fire truck turning templates were utilized in this evaluation.

Figure 8 presents the turning movements required for a vehicle turning into the southernmost project driveway, as well as exiting the site from both this driveway as well as the northernmost driveway. The southernmost project driveway has a driveway width of 28-feet that transitions to an internal drive aisle width of 24-feet as required by the City. The design of the project driveway is an adequate width to accommodate both inbound and outbound vehicle movements at the same time without conflicts. This design, along the proposed curb return radii, have been reviewed and are generally considered adequate. As such, vehicles entering the site via Paseo De Colinas can do so unimpeded, as a result a deceleration lane into the site is not required.

The northernmost driveway has been designed with a 14-foot opening which is designed to allow for outbound right-turn movements but restrict inbound right-turn movements. This design, along the proposed curb return radii, have been reviewed and are considered adequate (See **Figure 8** for passenger vehicle exiting the project site).

Figures 9 and 10 present the turning movements required of a trash truck and fire truck to circulate throughout the project site, respectively. Overall, the turning maneuvers for both trash truck and fire truck are considered adequate.

LEVEL OF SERVICE ANALYSIS

Although the anticipated trips related to the Project do not meet the requirements for the need for a traffic study, intersection level of service and queueing analysis have been completed to assess the Project's impact based on the Level of Service (LOS) standard and thresholds published in the *City of Laguna Niguel Transportation Assessment Guidelines*.

As part of this evaluation, the LOS analysis includes that traffic associated with student drop-off/pick-up activity that occurs at the Paseo De Colinas and Del Cerro intersection. Given Niguel Hills Middle School intends to close the southern stairs that now provides pedestrian (student) connectivity between the school campus and Paseo De Colinas, this traffic has been re-routed to the school's main access at Golden Lantern and Shark Bay, via the Paseo De Colinas at Golden Lantern intersection.

Analysis at four (4) study intersections have been performed within the vicinity of the Project during the weekday AM and PM peak hours as well as the morning drop-off and afternoon pick-up periods for existing traffic conditions without, then with the proposed Project. Below are the four (4) study intersections selected for analysis based on the direction and requirements of the City.

Key Study Intersections

1. Paseo De Colinas at Del Cerro
2. Cabot Road at Paseo De Colinas
3. Golden Lantern at Paseo De Colinas
4. Golden Lantern at Shark Bay

Volume Forecasting

Commuter Peak Period

Traffic counts were collected at the four (4) key study intersections in May and November 2023 while local area schools, including Niguel Hills Middle School, were still in session. During the time traffic counts were collected, the southern staircase for Niguel Hills Middle School was open and it was observed that traffic and pedestrian activity associated with student drop-off/pick-up occurs at the Paseo De Colinas and Del Cerro intersection. Existing AM and PM peak hour traffic counts were collected from 7:00 AM – 9:00 AM and from 4:00 PM – 6:00 PM which covers both the commuter peak hours and school drop-off/pick-up period.

Figures 11 and **12** present the existing AM and PM commuter peak hour counts, respectively. **Appendix A** contains the traffic count sheets for the key study intersections.

As a result of the proposed southern stairway closure, existing vehicles that utilize Del Cerro for drop-off/pick-up would alter their travel patterns and use Shark Bay. **Figures 13** and **14** present the anticipated distribution pattern related to the shift in traffic from Del Cerro to Shark Bay as a result of the southern staircase closure for the morning drop-off period and afternoon pick-up period, respectively.

The general, directional traffic distribution pattern for the proposed Project is graphically presented in **Figure 15**. The anticipated AM and PM peak hour Project only traffic volumes at these intersections are presented in **Figures 16** and **17**, respectively. The traffic volume assignments presented in **Figures 16** and **17** reflect the traffic distribution characteristics shown in **Figure 15** and the traffic generation forecast presented in **Table 2**.

Figures 18 and **19** present the existing plus project AM and PM peak hour traffic volumes at the four (4) key study intersections and two (2) project driveways with the addition of the trips generated by the proposed Project and shift related to the staircase closure.

School Peak Hour

Additional counts were collected during the school drop-off period (8:00 AM – 9:00 AM) and school pick-up period (3:00 PM – 4:00 PM) in May 2024 while local area schools, including Niguel Hills Middle School, were still in session. These counts included pedestrian utilization of the Niguel Hills Middle School staircase associated with student drop-off/pick-up that occurs at the Paseo De Colinas and Del Cerro intersection.

Figures 20 and **21** present the existing school peak hour counts for the morning drop-off and afternoon pick-up periods counts, respectively. **Appendix A** contains the traffic count sheets for the key study intersections.

Figures 22 and **23** present the existing plus project AM and PM peak hour traffic volumes at the four (4) key study intersections and two (2) project driveways with the addition of the trips generated by the proposed Project and shift related to the staircase closure.

City of Laguna Niguel Project Specific Threshold³

Signalized Intersections

A significant impact would occur at a study intersection when project-related traffic causes a signalized intersection to degrade from an acceptable LOS D or better to LOS E or LOS F; or the volume to capacity (V/C) ratio to increase by more than 0.01 at a signalized intersection operating at LOS E or LOS F.

Unsignalized Intersections

If an intersection is operating at LOS E or worse and a significant impact is anticipated (V/C ratio increase of more than 0.01), improvement is needed to improve intersection operations equal to the project-generated impact on the intersection. If an impact drops from LOS D or above to LOS E or F, improvement is required to bring the LOS back to the acceptable threshold level (LOS D) as a part of the project approval. No improvement is required for intersections operating at or above the acceptable threshold.

Existing With Project Peak Hour Intersection Capacity Analysis

Commuter Peak Period

Intersection level of service analysis has been performed at the key study intersections and two Project driveways for Existing and Existing With Project traffic conditions. **Table 3** summarizes the peak hour level of service results at the key study intersections for Existing With Project traffic conditions. The first column (1) of LOS values in **Table 3** presents a summary of existing AM and PM peak hour traffic conditions. The second column (2) lists Existing With Project traffic conditions. The third column (3) indicates whether the traffic associated with the Project will exceed the LOS standards of the City.

Review of column one (1) of **Table 3** indicates that the study intersections operate at LOS D or better during the existing traffic conditions for the AM and PM peak hours.

Review of column two (2) of **Table 3** indicates that the study intersections operate at LOS D or better during the existing plus project traffic conditions for the AM and PM peak hours.

Appendix B presents the ICU/HCM/LOS calculations for the AM and PM peak hours for the key study intersections.

School Peak Hour Intersection Capacity Analysis

Intersection level of service analysis has been performed at the key study intersections and two Project driveways for Existing and Existing With Project traffic

³ Source: *City of Laguna Niguel Transportation Assessment Guidelines*.
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conditions during school peak drop-off and pick-up times (7AM-8AM and 3PM-4PM). **Table 4** summarizes the peak hour level of service results at the key study intersections for Existing With Project traffic conditions during school peak. The first column (1) of LOS values in *Table 4* presents a summary of existing morning drop-off and afternoon pick-up periods traffic conditions. The second column (2) lists Existing With Project traffic conditions. The third column (3) indicates whether the traffic associated with the Project will exceed the LOS standards of the City.

Review of column one (1) of *Table 4* indicates that the study intersections operate at LOS D or better during the existing traffic conditions for the existing morning drop-off and afternoon pick-up periods.

Review of column two (2) of *Table 4* indicates that the study intersections operate at LOS D or better during the existing plus project traffic conditions for the existing morning drop-off and afternoon pick-up periods.

It should be noted that although vehicles queue along Golden Lantern during peak school times the intersection still operates at good service levels. It was observed that through traffic along Golden Lantern would avoid using the curb lane and proceeds with nominal disruption.

Appendix C presents the ICU/HCM/LOS calculations for the morning drop-off and afternoon pick-up periods key study intersections.

Intersection Queuing Analysis

Commuter Peak Period

A “turn pocket” queuing evaluation was prepared for the key study intersections of Paseo De Colinas at Del Cerro for the southbound left-turn movement and Cabot Road at Paseo De Colinas for the eastbound left-turn movement. This evaluation utilized the *Highway Capacity Manual (HCM)* methodology. The queuing evaluation was conducted based on projected peak hour traffic volumes and utilizes the 95th percentile vehicle queue associated with the left-turn lanes. The queues are calculated using HCM 7th Edition 95th percentile methodology, which corresponds to a condition that is generally taken as the maximum queue for the indicated movement.

The aforementioned queuing analyses were based on the forecast weekday AM and PM intersection turning movement volumes utilized in the level of service analyses. The existing lane configurations and storage lengths were determined based on a review of aerial maps of the subject intersections obtained from Google Earth and on field reviews conducted by LLG Engineers. An average vehicle length of 25 feet is assumed for the purposes of this analysis.

Table 5 identifies the minimum required stacking/storage lengths for the aforementioned left-turn lanes based on Existing and Existing Plus Project traffic volumes in the AM and PM hours. Review of columns (1) and (2) of *Table 5* indicates that the Paseo De Colinas at Del Cerro southbound left-turn lane and Cabot Road at Paseo De Colinas eastbound left-turn lane have queues which can be accommodated within the existing storage.

School Peak Period

Table 6 identifies the minimum required stacking/storage lengths for the aforementioned left-turn lanes based on Existing and Existing Plus Project traffic volumes during the school peak period in the AM and PM hours. Review of columns (1) and (2) of *Table 6* indicates that the Paseo De Colinas at Del Cerro southbound left-turn lane and Cabot Road at Paseo De Colinas eastbound left-turn lane have queues which can be accommodated within the existing storage.

Appendix D presents the queueing calculation worksheets for the two (2) key study intersections.

VMT SCREENING ASSESSMENT

The purpose of a VMT assessment is to evaluate the Project based on Senate Bill 743 (SB 743) requirements consistent with *Technical Advisory on Evaluating Transportation Impacts in California Environmental Quality Act (CEQA)*, December 2018 prepared by State of California Governor's Office of Planning and Research (OPR) and the CEQA VMT Analysis guidelines identified within the *City of Laguna Niguel Transportation Assessment Guidelines*.

The City's VMT Guidelines provides guidance for analysis of VMT assessments under SB743. The City documents provides screening thresholds to assess whether further VMT analysis is required based on project location, size, or consistency with the SCAG Regional Transportation Plan/Sustainable Communities Strategy.

Section 3.2 of the *City of Laguna Niguel Transportation Assessment Guidelines dated November 2020* indicate that projects generating less than 500 vehicle trips per day based on the latest ITE Trip Generation Manual are presumed to be less than significant. Given the results of the proposed Project's trip generation forecast, the proposed Project trips are expected to generate less than 500 daily trips during the weekday. Therefore, LLG concludes that the Project would be screened out from a VMT assessment and its VMT impact are presumed to be less than significant.

CONCLUSION

As a result of the information above, the proposed Project would result in 162 daily trips, with 10 AM peak hour trips and 12 PM peak hour trips. When assessing the need for further analysis at study intersections, a “50 peak hour trip” threshold is applied based on the *City of Laguna Niguel Transportation Assessment Guidelines*. Given the results of the trip generation forecast we conclude that the added Project trips would have minimal impacts and that no additional analysis is required. Further, given these results, and based on the City’s guidelines, the Project would screen out and should not be required to prepare a traffic impact (Level of Service) analysis. Regardless, level of service and queuing analysis was completed at four (4) study intersections and two (2) project driveways. Both LOS and queues were considered to be adequate with the addition of Project traffic, including school related traffic that would be re-routed from the intersection of Paseo De Colinas at Del Cerro to the school’s main access at Golden Lantern and Shark Bay with the closure of the southern staircase that previously provided pedestrian (student) connectivity between the school campus and Paseo De Colinas.

Based on existing queuing observations along Shark Bay/Golden Lantern shows that there is adequate stacking available along both streets with minimal impacts to the users of the roadway. Stacking currently occurs along Shark Bay and Golden Lantern towards Paseo De Colinas. As a result of the closure to the staircase, parents using Del Cerro for drop-off and pick-up would be re-routed to the school’s main access at Golden Lantern and Shark Bay or other nearby public streets which allow parking. During the morning drop-off period the added demand to the queue are considered minimal. However, the afternoon pick-up period could result in forecasted queues to extent along Golden Lantern onto either Paseo De Colinas or continue along Golden Lantern past Paseo De Colinas. It should be noted that this would occur during non-commuter times when less traffic is on the roadway.

Additionally, sight lines at the project driveway have been reviewed and are considered adequate. Adequate sight lines give the motorist the ability to see gaps in traffic to help with egress from the site. Due to these sight lines, an acceleration lane is not required. Ingress to the site can be done comfortably without the need of a deceleration lane.

In addition, the proposed Project trips are expected to generate less than 500 daily trips during the weekday, and therefore, it can also be concluded that the Project would be screened out from a VMT assessment and its VMT impact are presumed to be less than significant.

As noted, site access and internal circulation was determined to be adequate. However, the following improvements are recommended in conjunction with the development of the proposed Project to facilitate ingress and egress to the project site:

- Northerly Project Driveway: To supplement the design of the proposed driveway, install a “STOP” sign and stop bar at Project’s northerly driveway on Paseo de Colinas plus a “No Right Turn (R3-1)” sign facing southbound traffic to deter motorists from entering at this “exit only” driveway.
- Southerly Project Driveway: Install a “STOP” sign and stop bar at Project’s southerly driveway on Paseo de Colinas.

As a result of concerns raised by the City and Community related to speeding along Paseo De Colinas near the project site, the Project is proposing to fund bicycle safety enhancement and traffic calming measures. **Figures 24A** through **24D**, and **25** present the proposed bicycle enhancements and traffic calming measures, respectively.

* * * * *

We appreciate the opportunity to be of service on this Project. Should you need further assistance, or have any questions regarding this analysis, please call us at (949) 825-6175.

Very truly yours,
Linscott, Law & Greenspan, Engineers



Richard E. Barretto, P.E.
Principal



cc: Shane S. Green, P.E. LLG

Attachments

- Figure 1: Vicinity Map
- Figure 2: Existing Aerial Photograph
- Figure 3: Proposed Site Plan
- Figure 4A: Tuesday AM Drop-off Period Queuing along Shark Bay and Golden Lantern
- Figure 4B: Wednesday AM Drop-off Period Queuing along Shark Bay and Golden Lantern
- Figure 4C: Thursday AM Drop-off Period Queuing along Shark Bay and Golden Lantern

Figure 5A: Tuesday PM Pick-Up Period Queuing along Shark Bay and Golden Lantern

Figure 5B: Wednesday PM Pick-Up Period Queuing along Shark Bay and Golden Lantern

Figure 5C: Thursday PM Pick-Up Period Queuing along Shark Bay and Golden Lantern

Figure 6: Sight Distance Analysis – Driveway No. 1

Figure 7: Sight Distance Analysis – Driveway No. 2

Figure 8: Passenger Vehicle Turning Analysis

Figure 9: Trash Truck Turning Analysis

Figure 10: Fire Truck Turning Analysis

Figure 11: Existing AM Peak Hour Traffic Volumes

Figure 12: Existing PM Peak Hour Traffic Volumes

Figure 13: Volume Redistribution for Stairway Closure AM Peak Hour

Figure 14: Volume Redistribution for Stairway Closure PM Peak Hour

Figure 15: Project Distribution Pattern

Figure 16: AM Peak Hour Project Traffic Volumes

Figure 17: PM Peak Hour Project Traffic Volumes

Figure 18: Existing Plus Project AM Peak Hour Traffic Volumes

Figure 19: Existing Plus Project PM Peak Hour Traffic Volumes

Figure 20: Existing AM Drop-Off Period Traffic Volumes

Figure 21: Existing PM Pick-Up Period Hour Traffic Volumes

Figure 22: Existing Plus Project AM Drop-Off Period Traffic Volumes

Figure 23: Existing Plus Project PM Pick-Up Period Hour Traffic Volumes

Figure 24A: Green-Bike Improvements for Paseo De Colinas at Loma Linda

Figure 24B: Green-Bike Improvements for Paseo De Colinas at Project Driveways

Figure 24C: Green-Bike Improvements for Paseo De Colinas at Del Cerro

Figure 24D: Green-Bike Improvements for Paseo De Colinas at Golden Lantern

Figure 25: Potential Location of Vehicle Speed Feedback Sign

Table 1: Project Development Summary

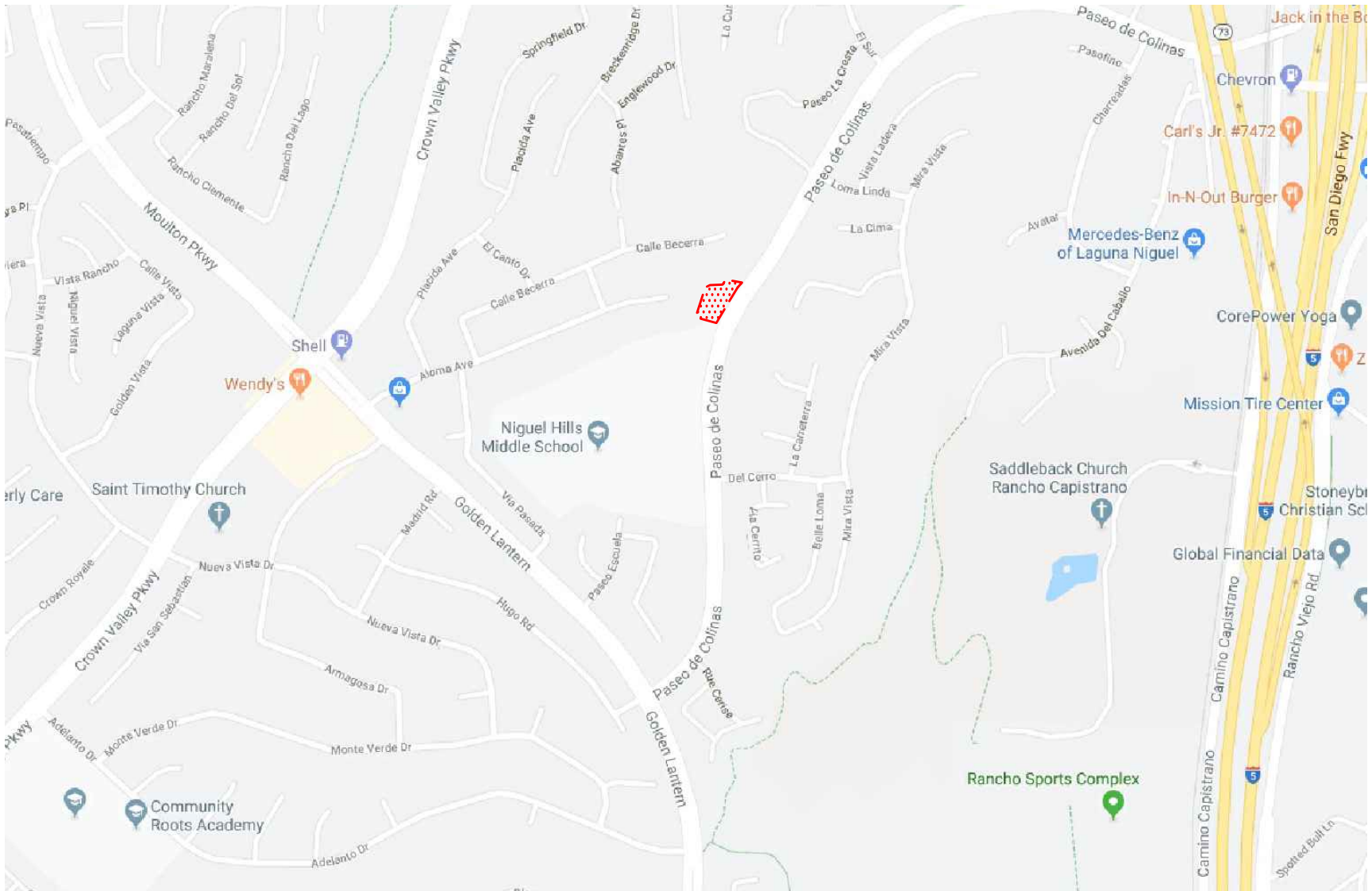
Table 2: Project Traffic Generation Rates and Forecast

Table 3: Existing with Project Peak Hour Intersection Capacity Analysis – During Weekday AM and PM Peak Commute Hours

Table 4: Existing with Project Peak Hour Intersection Capacity Analysis – During School Drop-off and Pick-Up Periods

Table 5: Existing with Project Peak Hour Intersection Queuing Analysis – During Weekday AM and PM Peak Commute Hours

Table 6: Existing with Project Peak Hour Intersection Queuing Analysis – During School Drop-off and Pick-Up Periods



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SOURCE: GOOGLE

KEY

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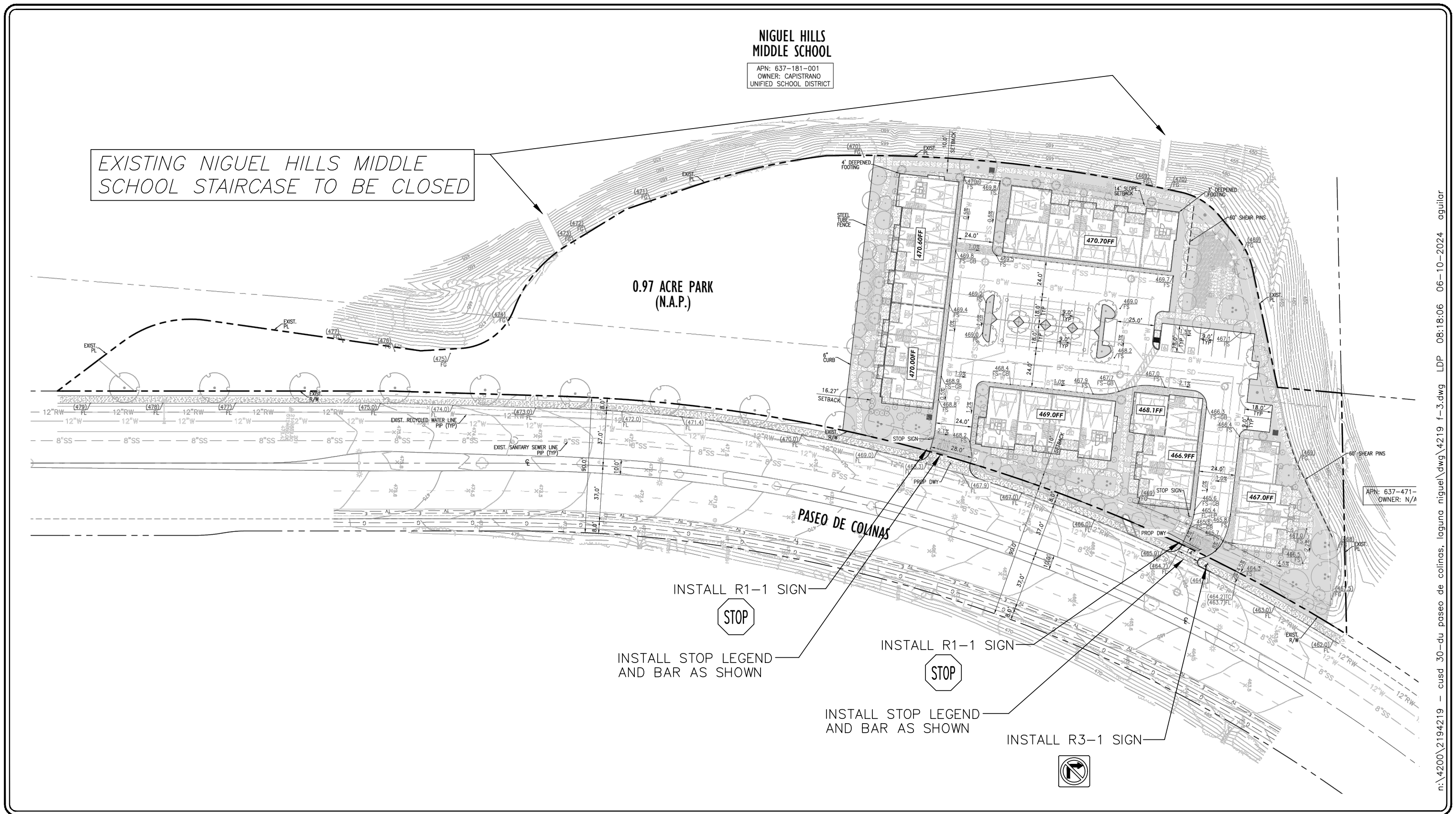
FIGURE 1

VICINITY MAP

CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



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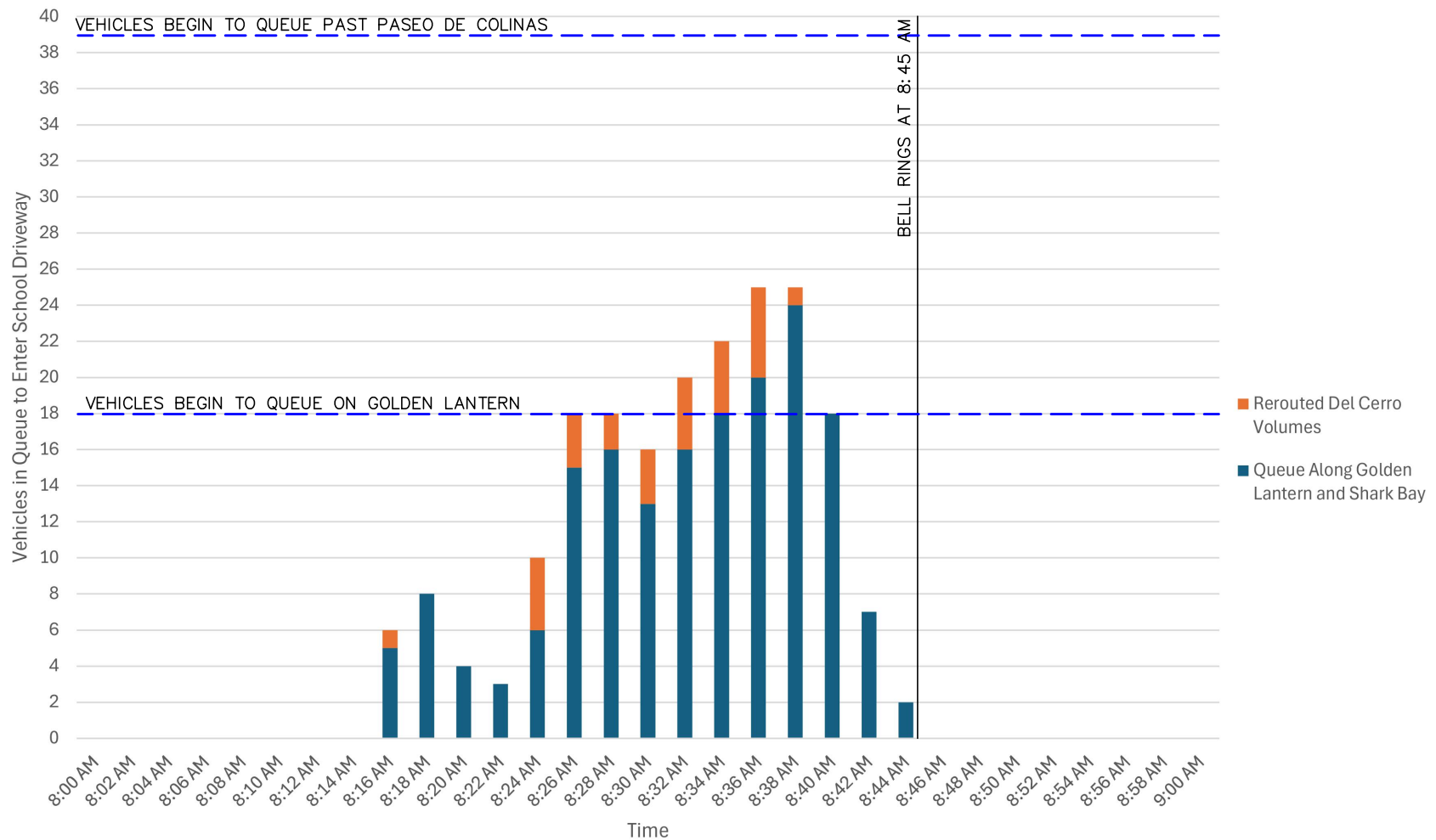


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FIGURE 3

PROPOSED SITE PLAN
 CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



*NOTE: REPORTED QUEUES ARE FROM THE START OF THE SCHOOL DRIVEWAY ALONG SHARK BAY

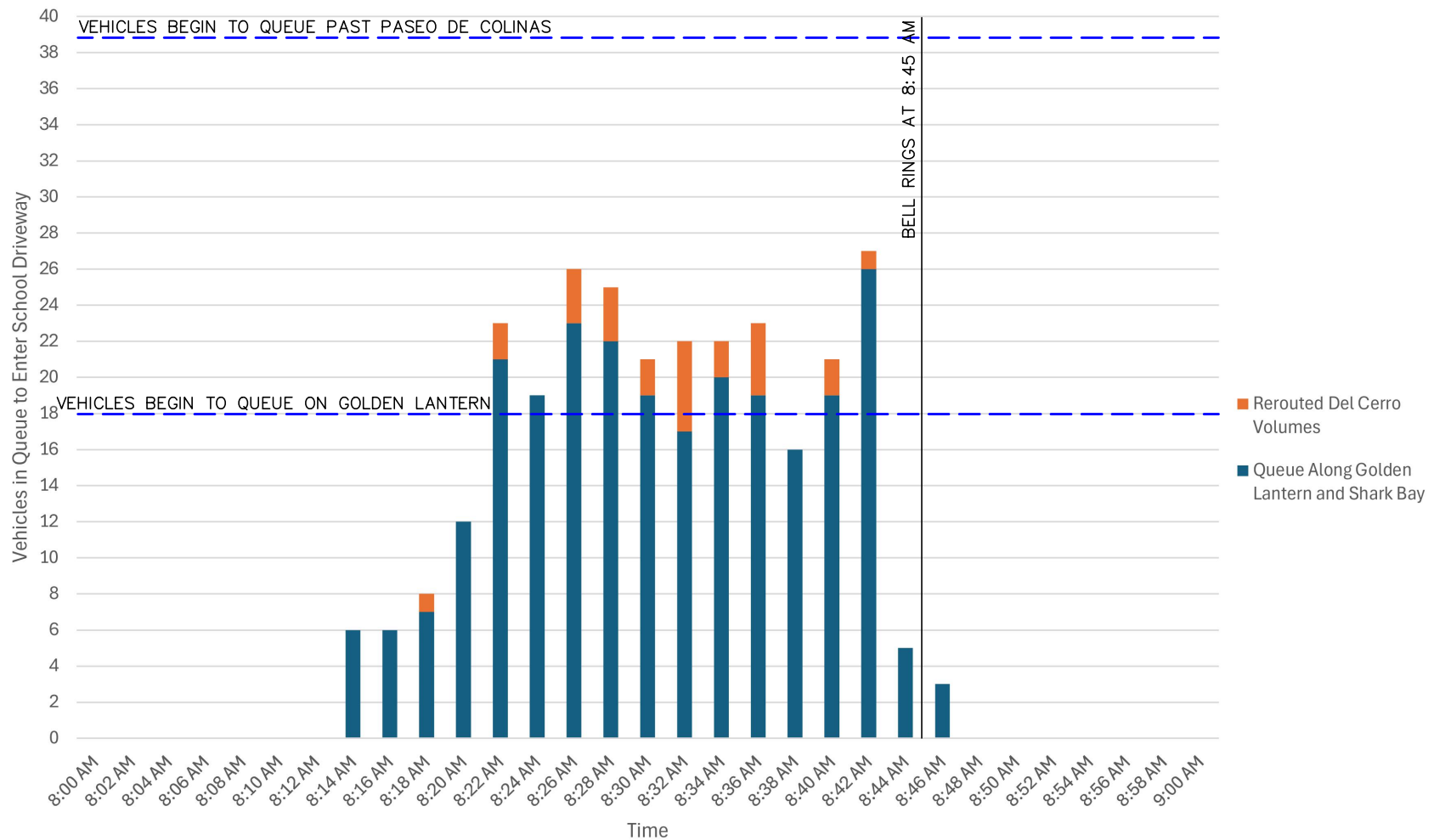
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FIGURE 4A

**TUESDAY AM DROP-OFF PERIOD QUEUING
ALONG SHARK BAY AND GOLDEN LANTERN**

CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



*NOTE: REPORTED QUEUES ARE FROM THE START OF THE SCHOOL DRIVEWAY ALONG SHARK BAY

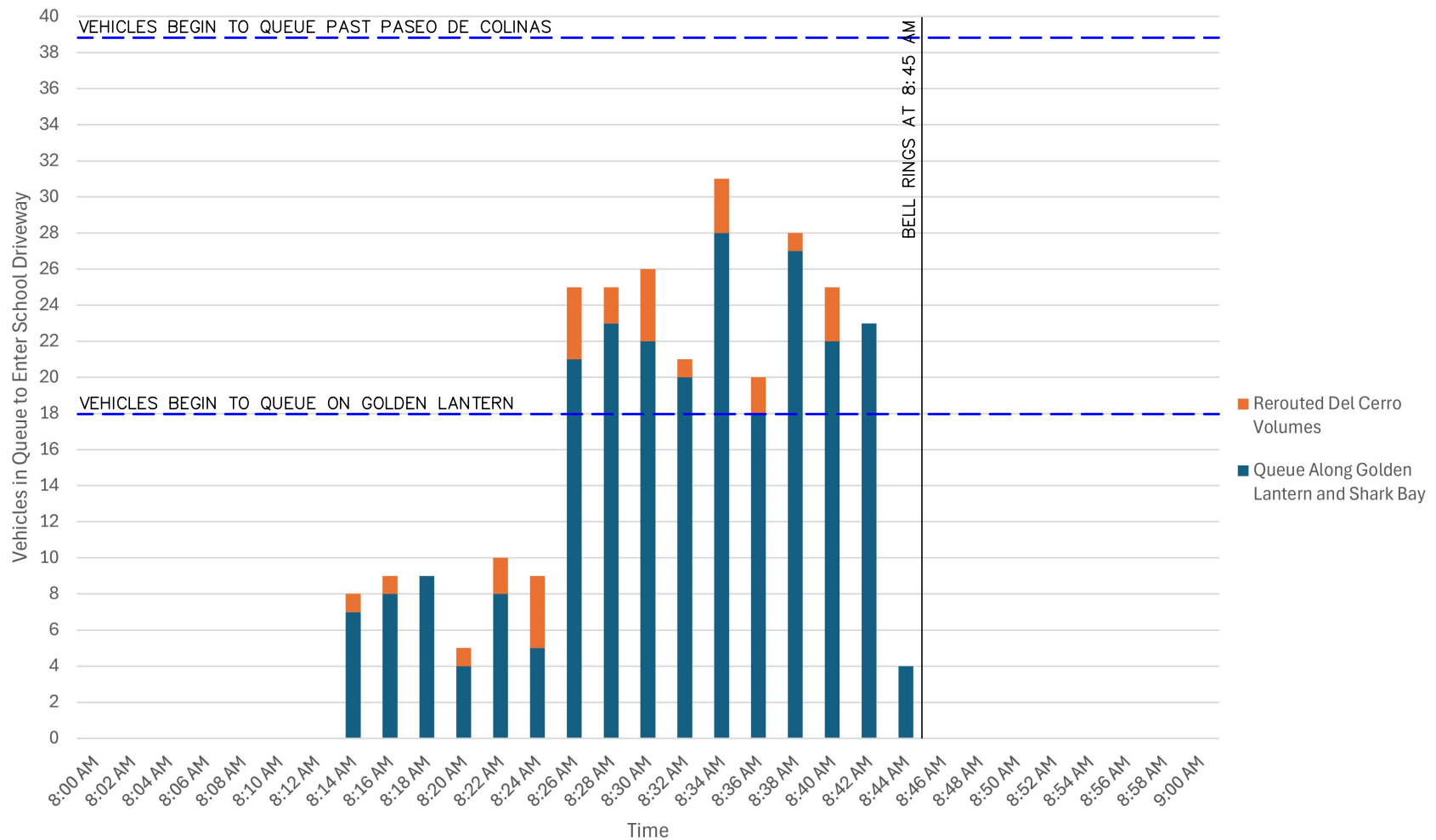
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FIGURE 4B

WEDNESDAY AM DROP-OFF PERIOD QUEUING
ALONG SHARK BAY AND GOLDEN LANTERN

CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



*NOTE: REPORTED QUEUES ARE FROM THE START OF THE SCHOOL DRIVEWAY ALONG SHARK BAY

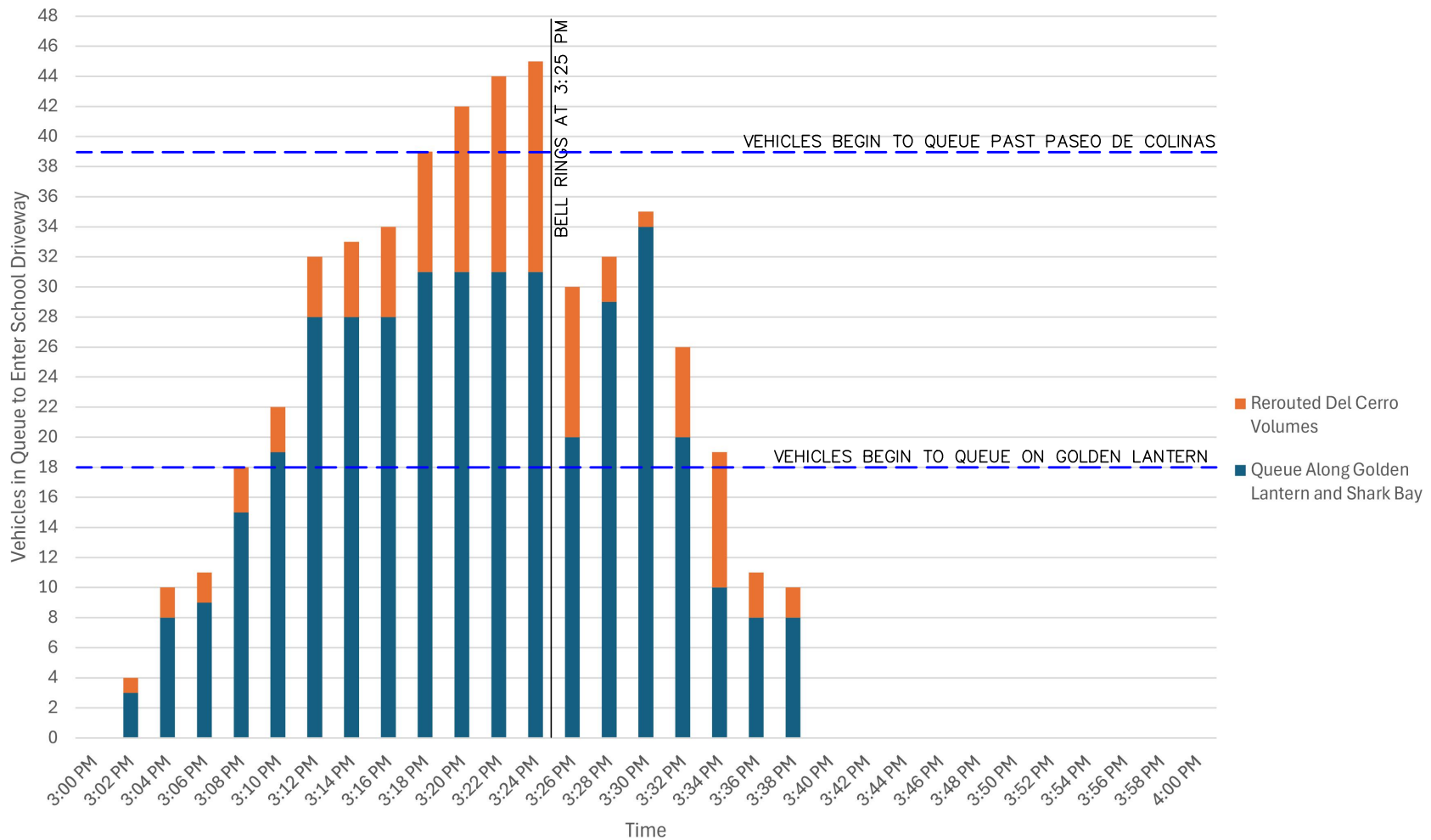
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FIGURE 4C

THURSDAY AM DROP-OFF PERIOD QUEUING
ALONG SHARK BAY AND GOLDEN LANTERN

CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



*NOTE: REPORTED QUEUES ARE FROM THE START OF THE SCHOOL DRIVEWAY ALONG SHARK BAY

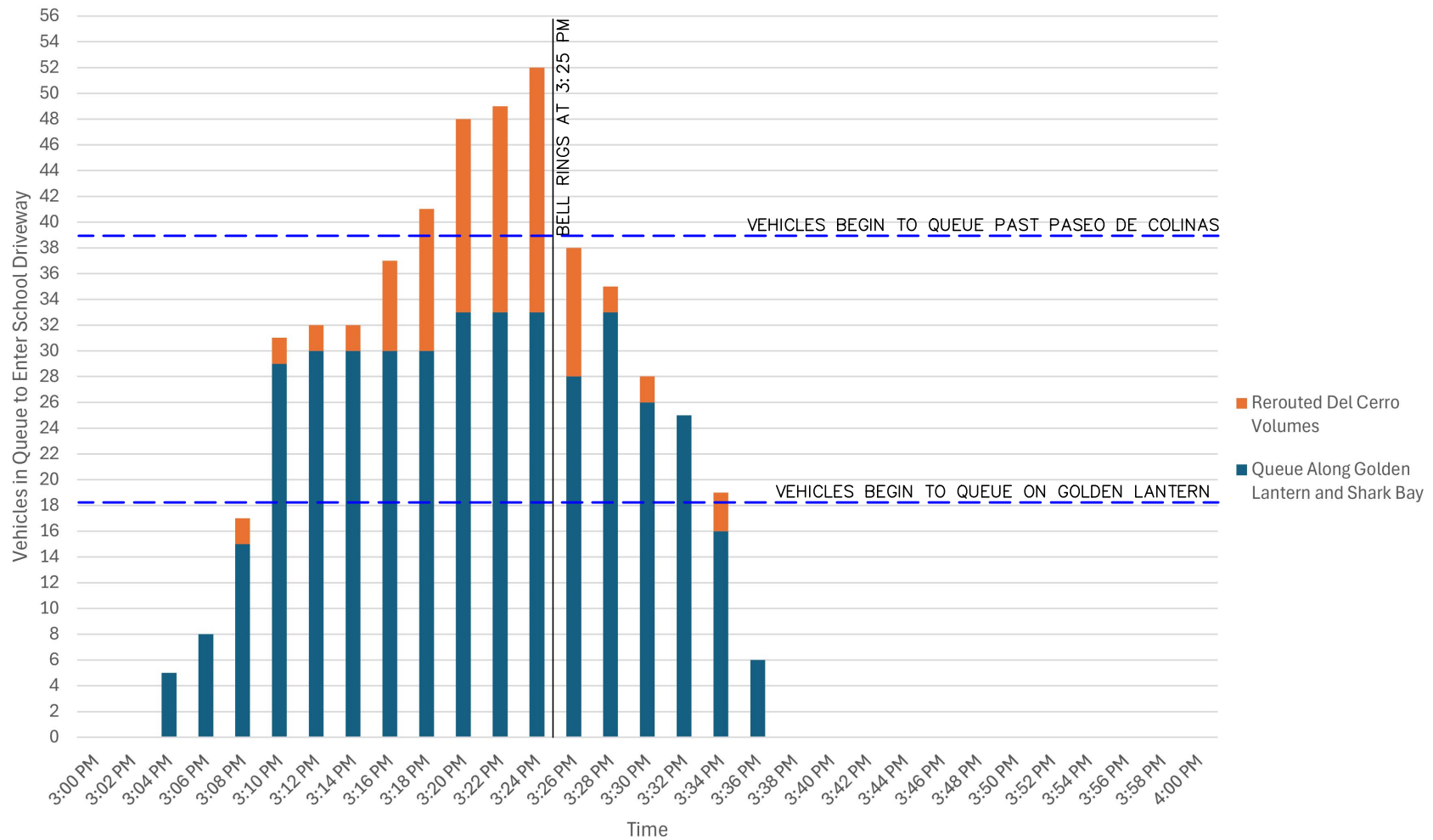
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FIGURE 5A

**TUESDAY PM PICK-UP PERIOD QUEUING
ALONG SHARK BAY AND GOLDEN LANTERN**

CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



*NOTE: REPORTED QUEUES ARE FROM THE START OF THE SCHOOL DRIVEWAY ALONG SHARK BAY

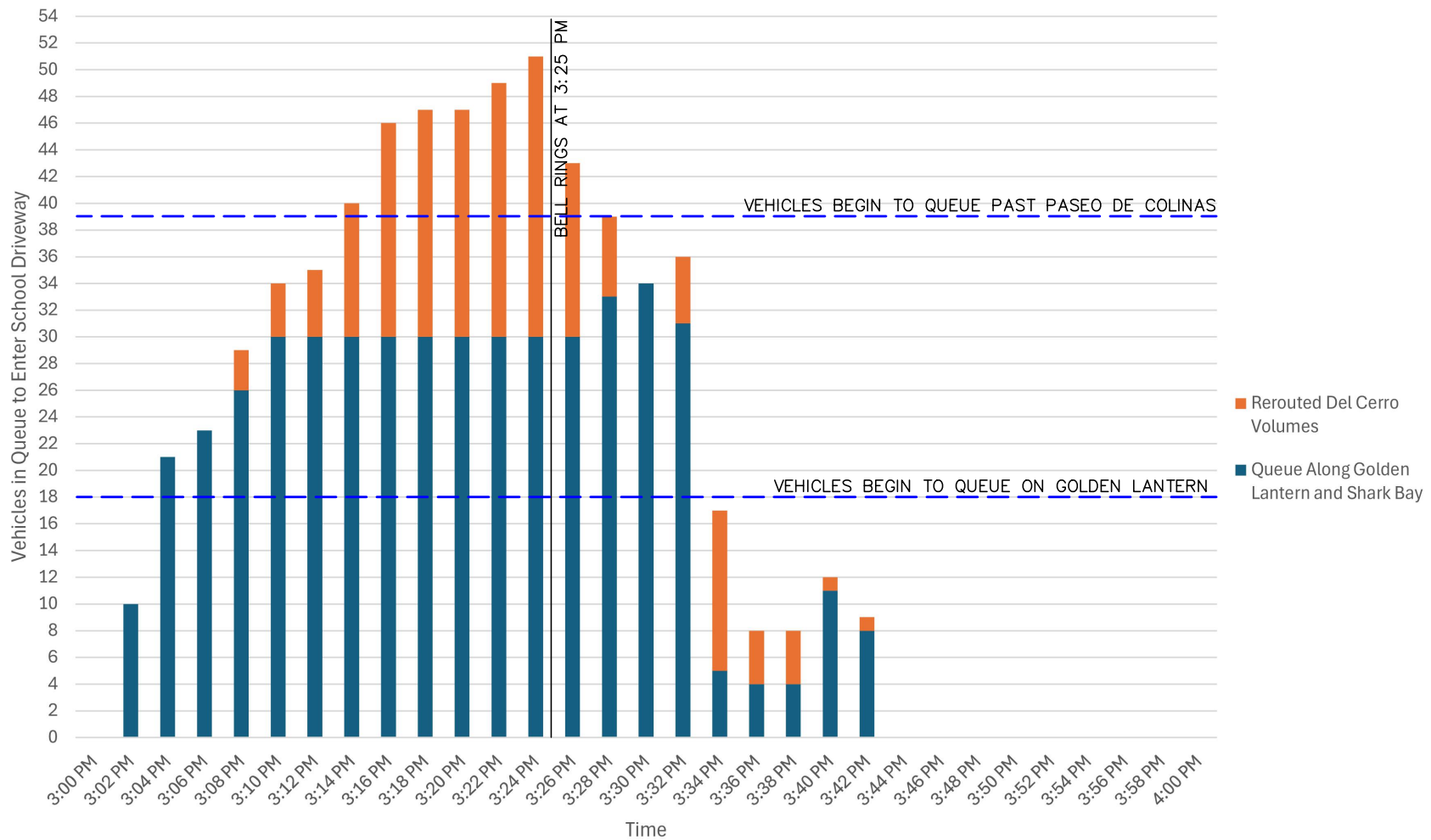
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FIGURE 5B

WEDNESDAY PM PICK-UP PERIOD QUEUING
ALONG SHARK BAY AND GOLDEN LANTERN

CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



*NOTE: REPORTED QUEUES ARE FROM THE START OF THE SCHOOL DRIVEWAY ALONG SHARK BAY

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FIGURE 5C

**THURSDAY PM PICK-UP PERIOD QUEUING
ALONG SHARK BAY AND GOLDEN LANTERN**

CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



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SCALE: 1=60'

SIGHT DISTANCE

DESIGN SPEED LIMIT:	55 MPH
REQUIRED STOPPING SIGHT DISTANCE:	500 FEET
REQUIRED CORNER SIGHT DISTANCE:	526 FEET

LEGEND


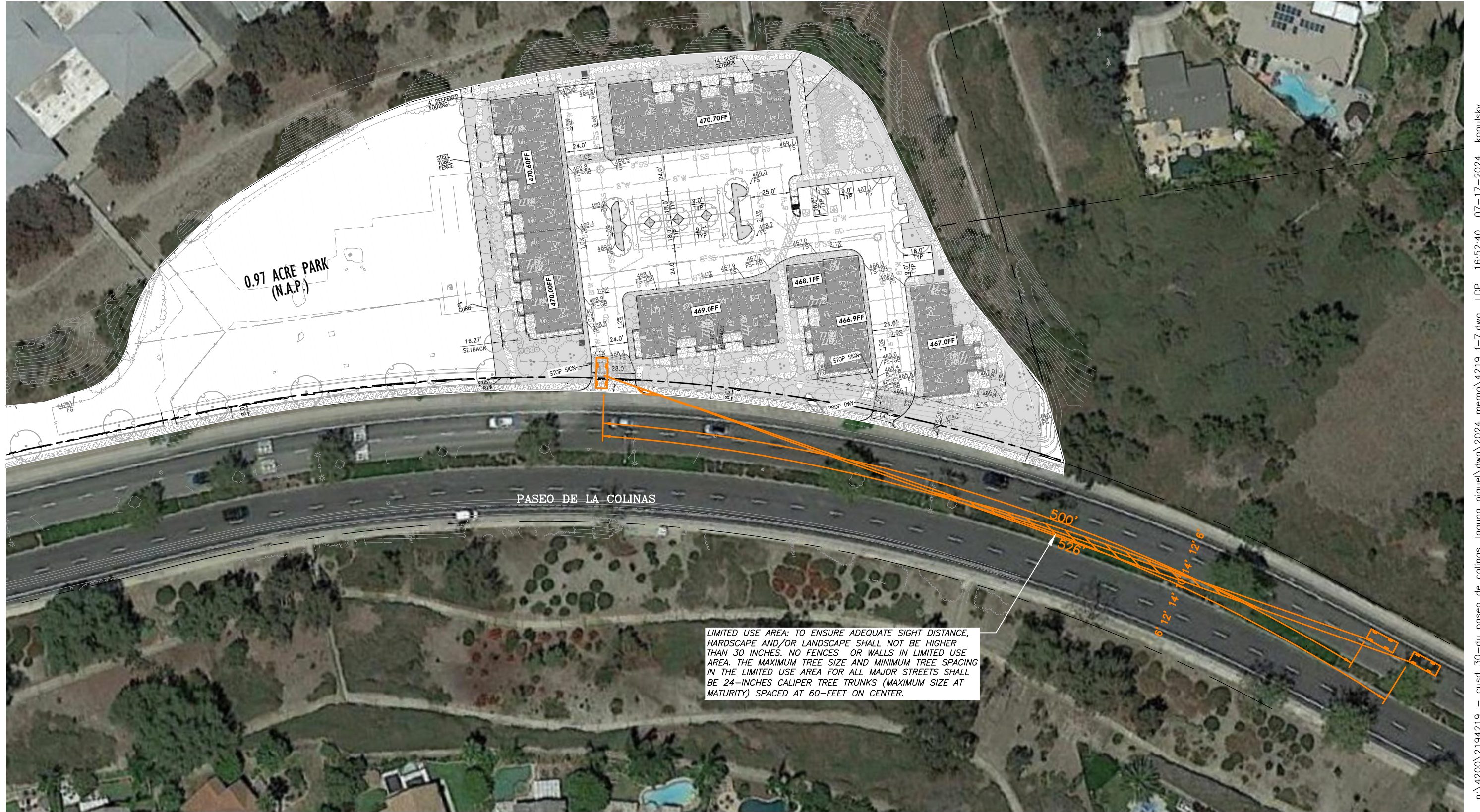
 PUBLIC RIGHT-OF-WAY LIMITED USE AREA: TO ENSURE ADEQUATE SIGHT DISTANCE, HARDSCAPE AND/OR LANDSCAPE SHALL NOT BE HIGHER THAN 6 INCHES ABOVE THE CURB/SIDEWALK. NO FENCES OR WALLS IN LIMITED USE AREA.

FIGURE 6

SIGHT DISTANCE ANALYSIS – DRIVEWAY NO. 1
CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



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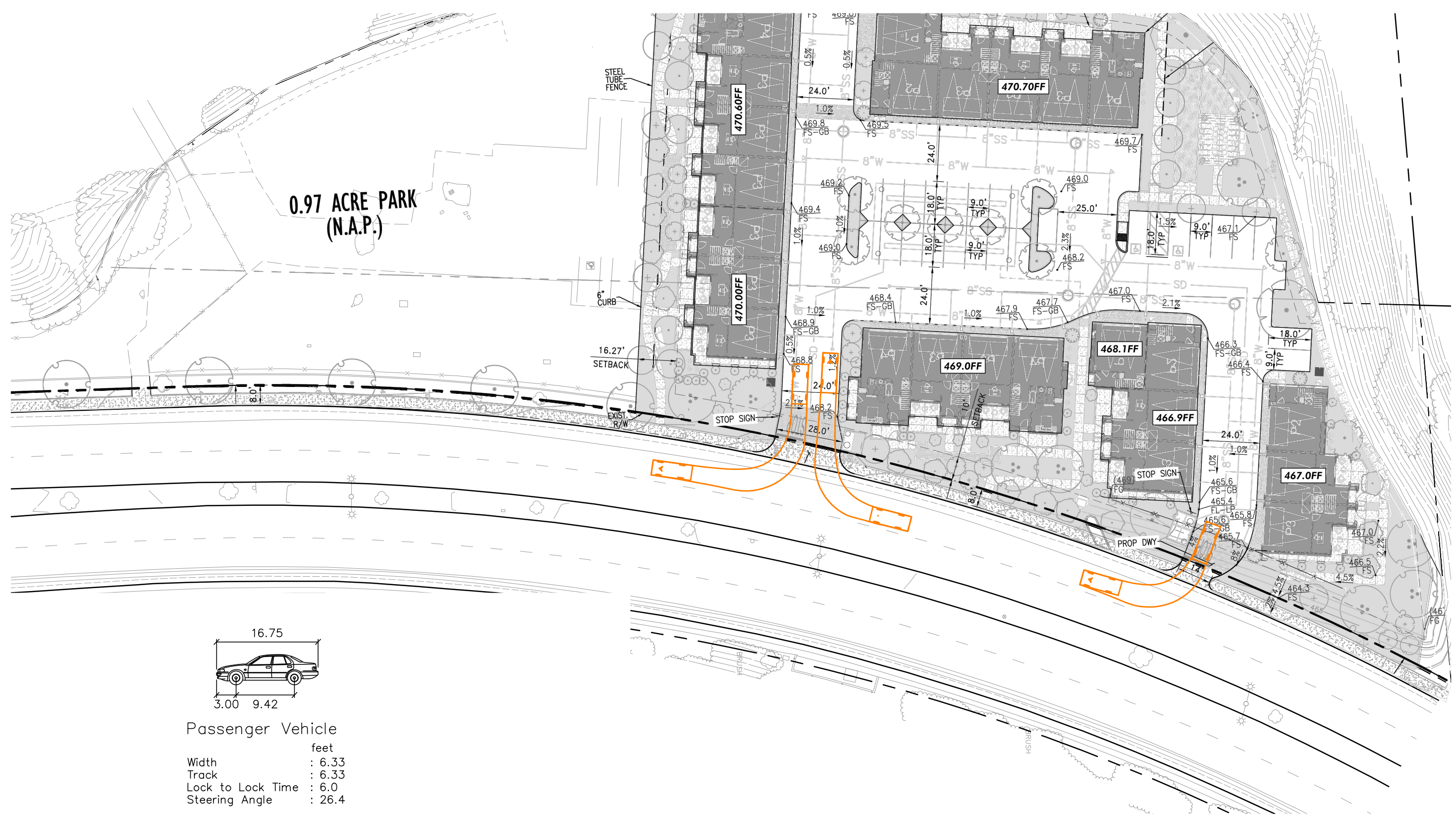


SIGHT DISTANCE

DESIGN SPEED LIMIT:	55 MPH
REQUIRED STOPPING SIGHT DISTANCE:	500 FEET
REQUIRED CORNER SIGHT DISTANCE:	526 FEET

FIGURE 7

SIGHT DISTANCE ANALYSIS – DRIVEWAY NO. 2
CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL

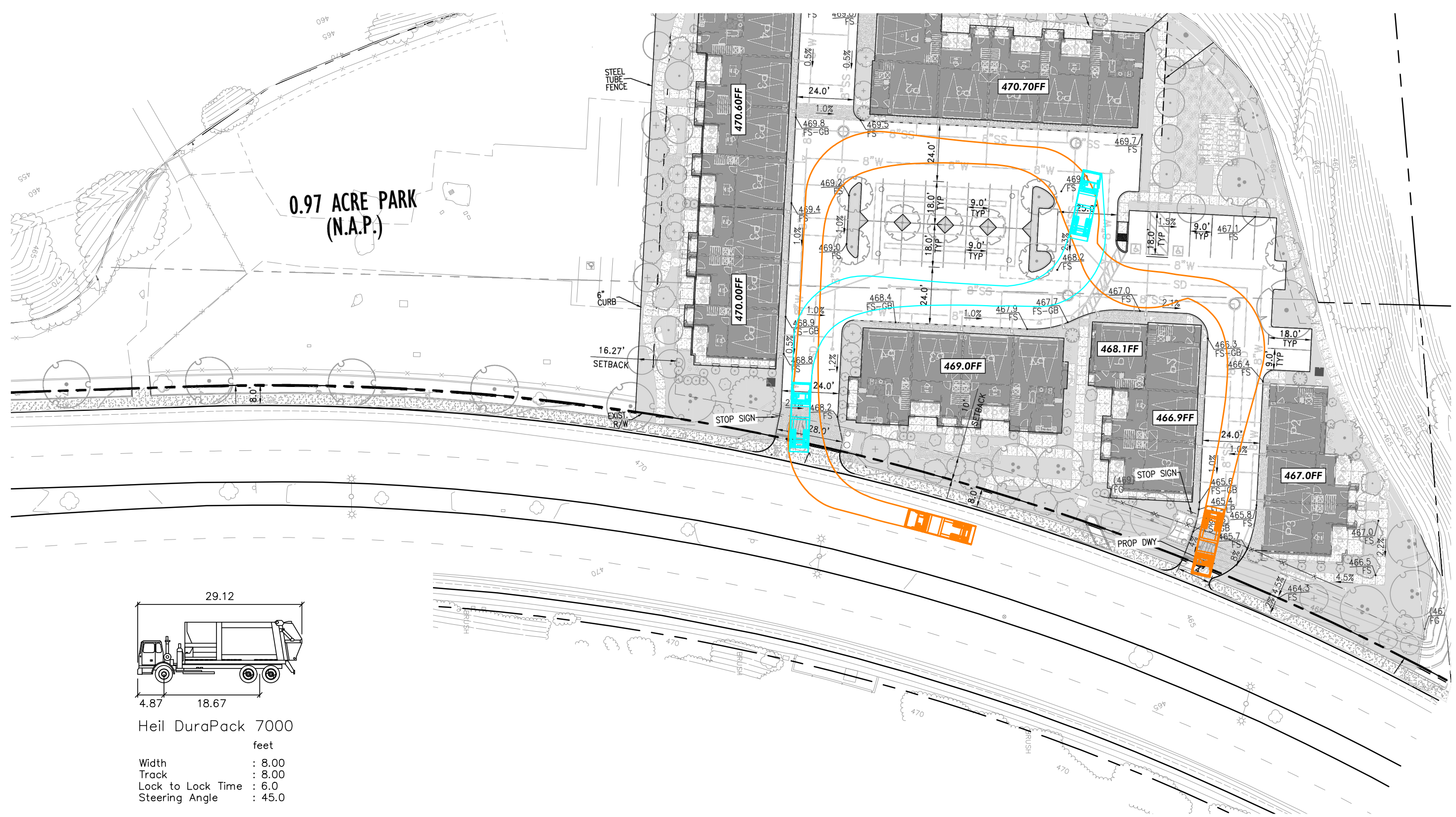


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FIGURE 8

PASSENGER VEHICLE TURNING ANALYSIS
 CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL

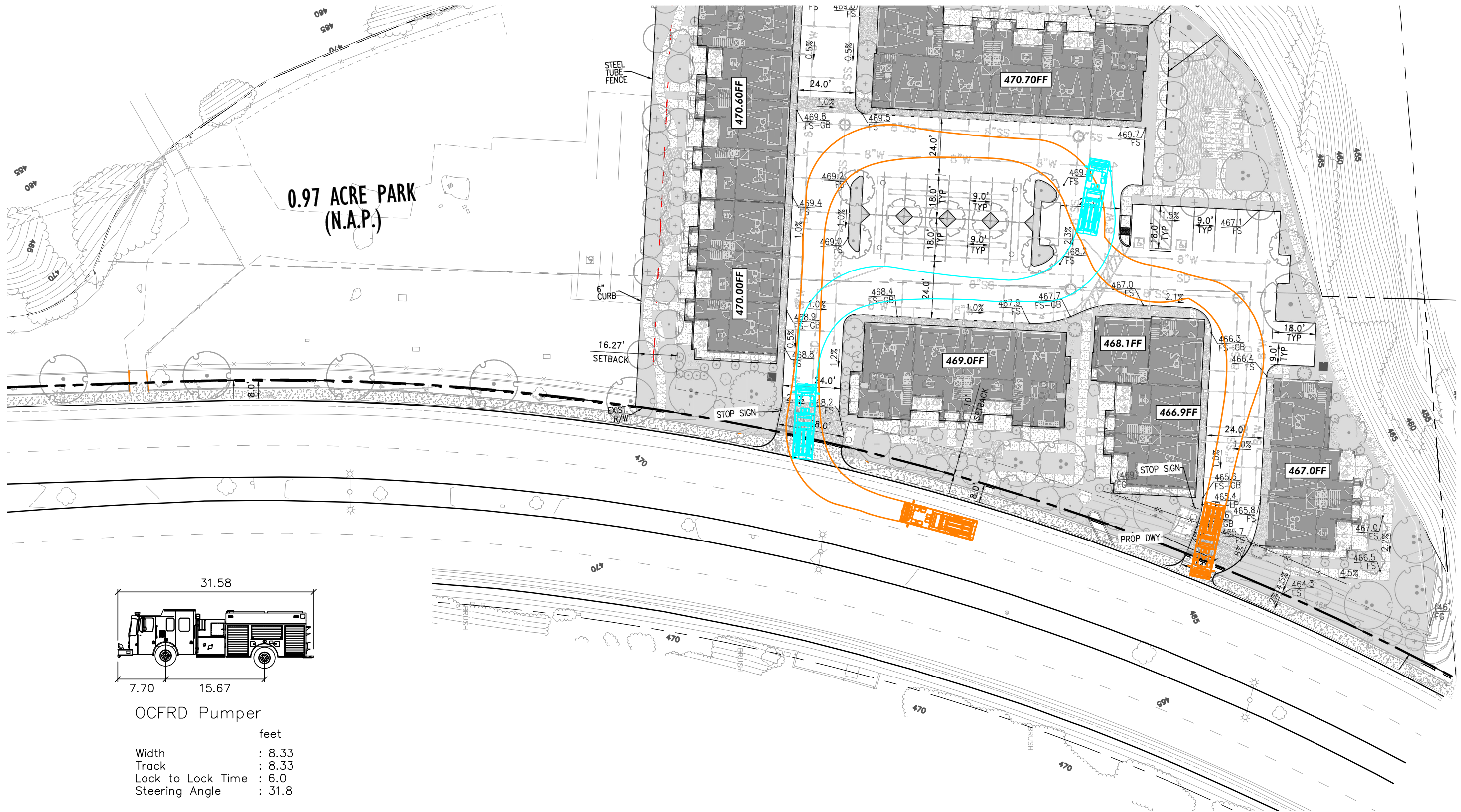


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FIGURE 9

TRASH TRUCK TURNING ANALYSIS
CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL

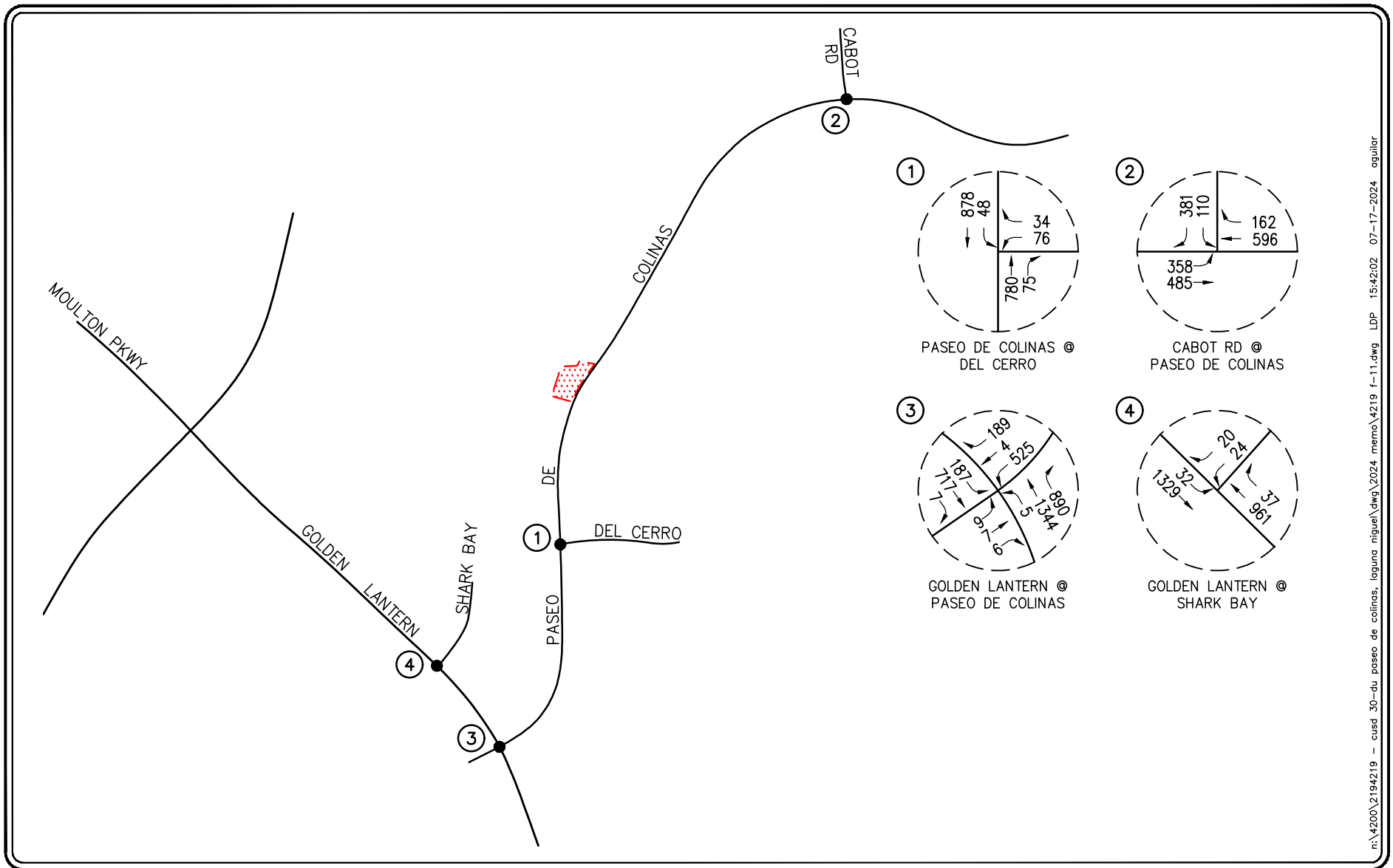


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FIGURE 10

FIRE TRUCK TURNING ANALYSIS
 CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



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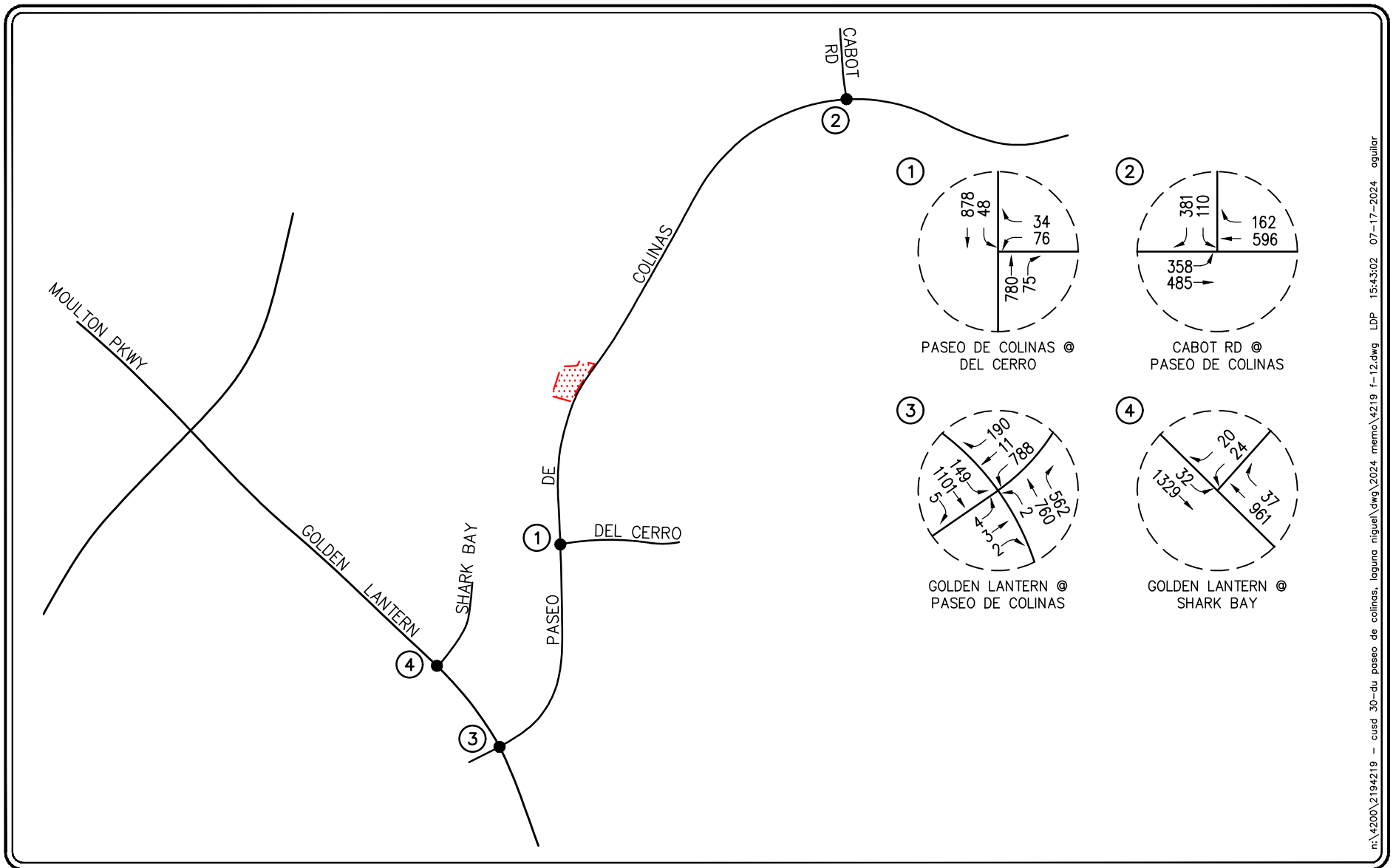
NO SCALE

KEY

- ① = STUDY INTERSECTION
- [Red Hatched Box] = PROJECT SITE

FIGURE 11

EXISTING AM PEAK HOUR TRAFFIC VOLUMES
CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



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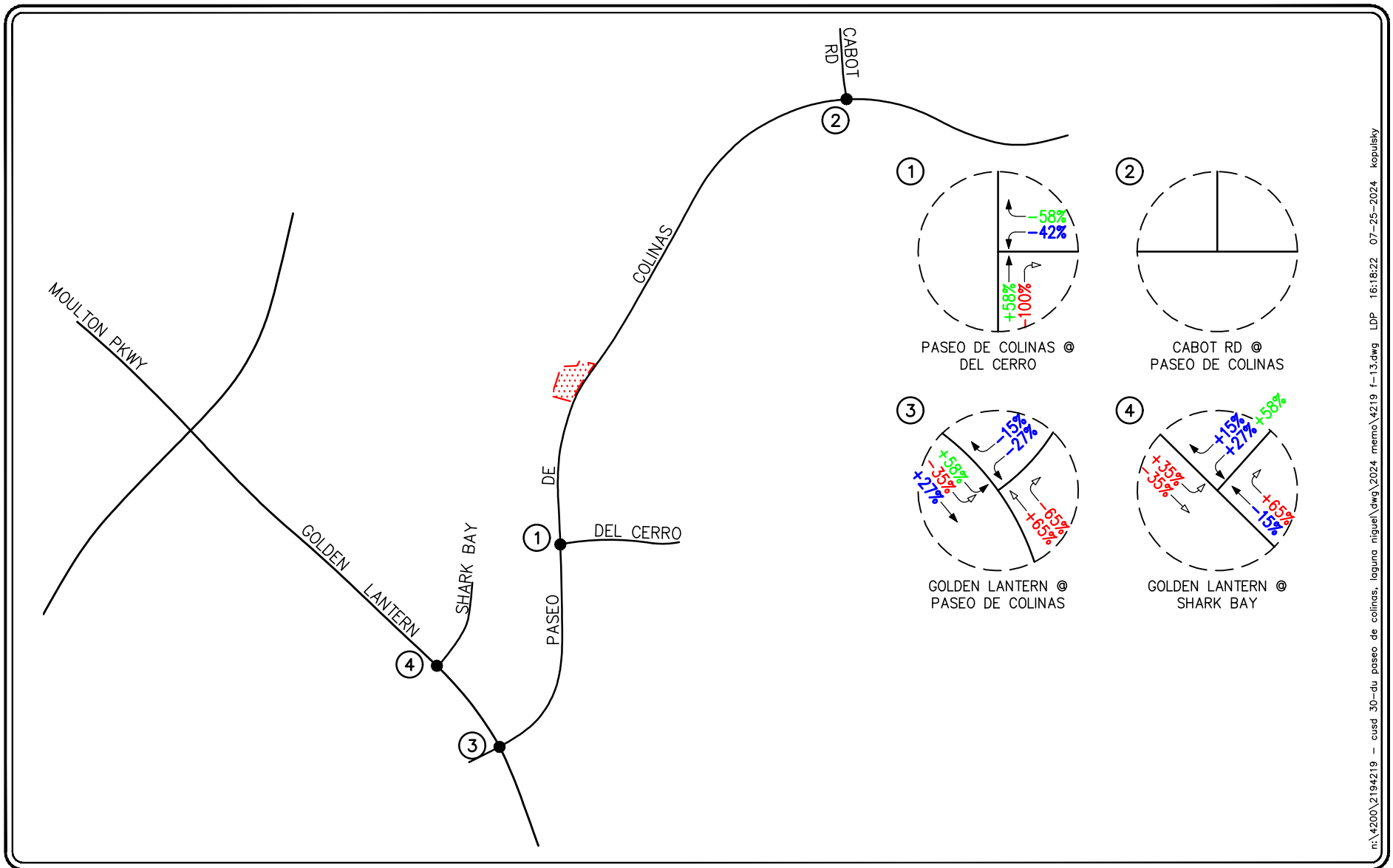
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KEY

- ① = STUDY INTERSECTION
- [Red Hatched Box] = PROJECT SITE

FIGURE 12

EXISTING PM PEAK HOUR TRAFFIC VOLUMES
CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



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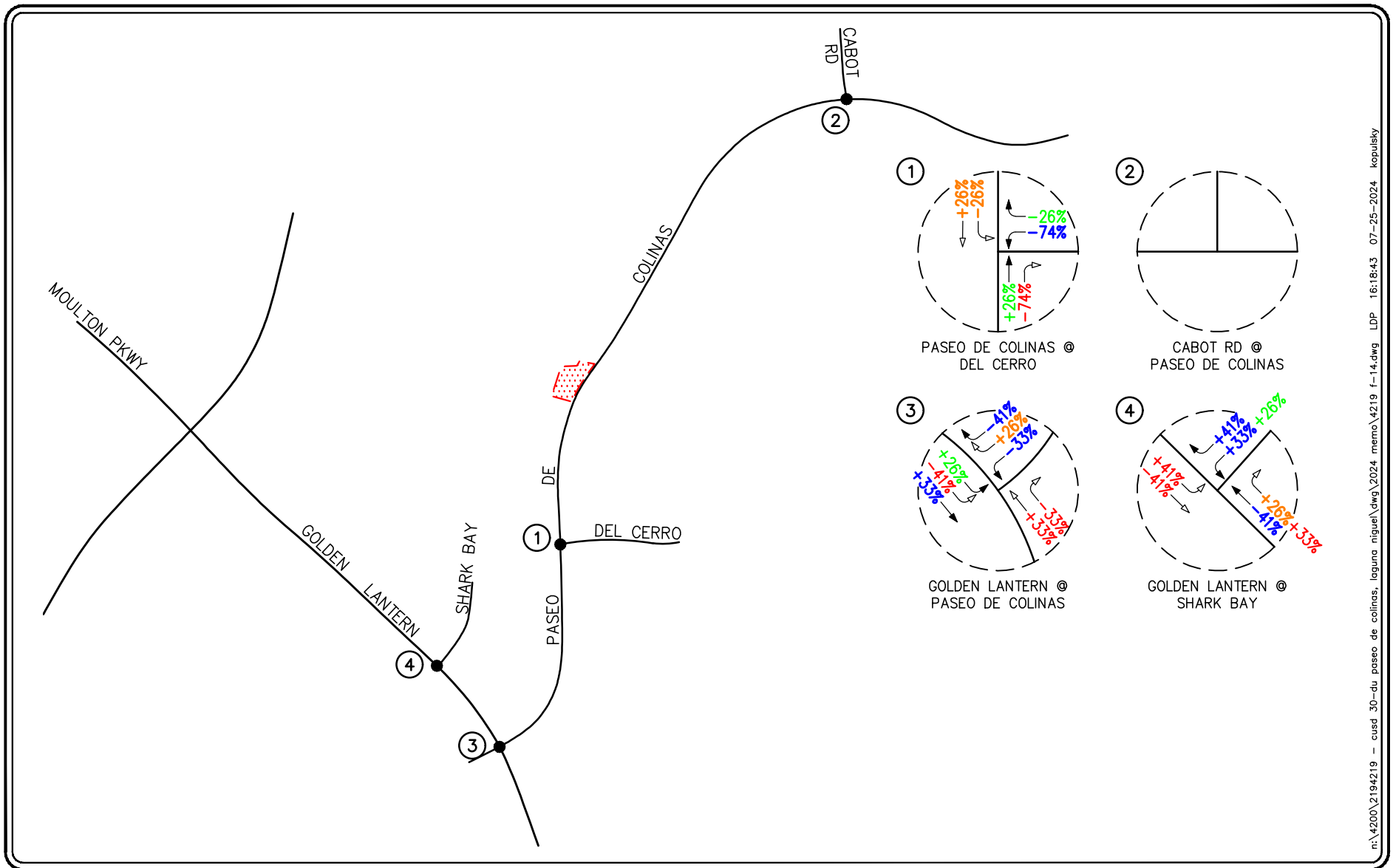
KEY

- ① = STUDY INTERSECTION
- ← = INBOUND PERCENTAGE
- = OUTBOUND PERCENTAGE
- ▨ = PROJECT SITE

FIGURE 13

VOLUME REDISTRIBUTION FOR STAIRWAY CLOSURE AM PEAK HOUR

CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



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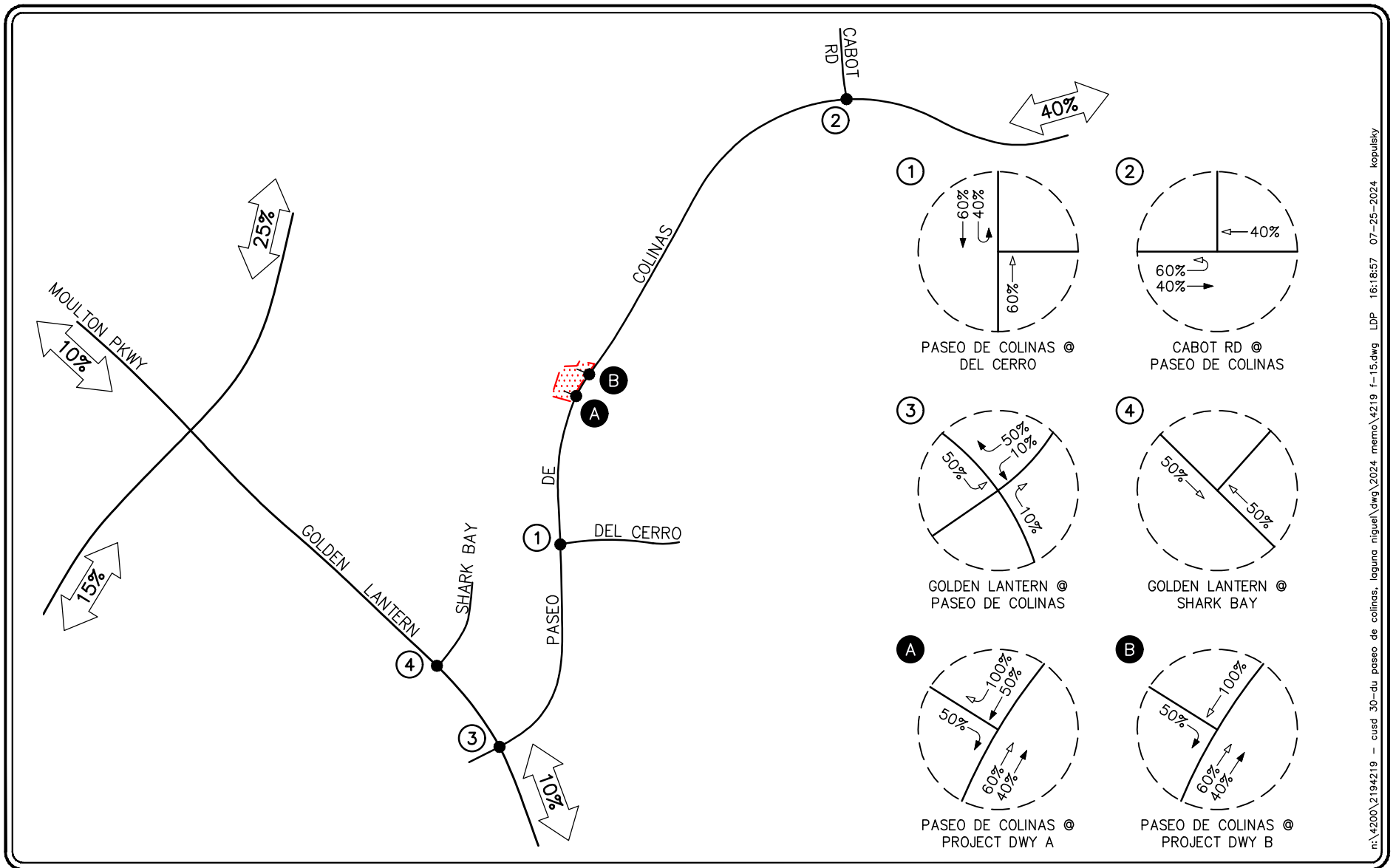
KEY

- ① = STUDY INTERSECTION
- ← = INBOUND PERCENTAGE
- = OUTBOUND PERCENTAGE
- = PROJECT SITE

FIGURE 14

VOLUME REDISTRIBUTION FOR STAIRWAY CLOSURE PM PEAK HOUR

CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



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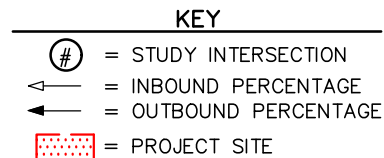
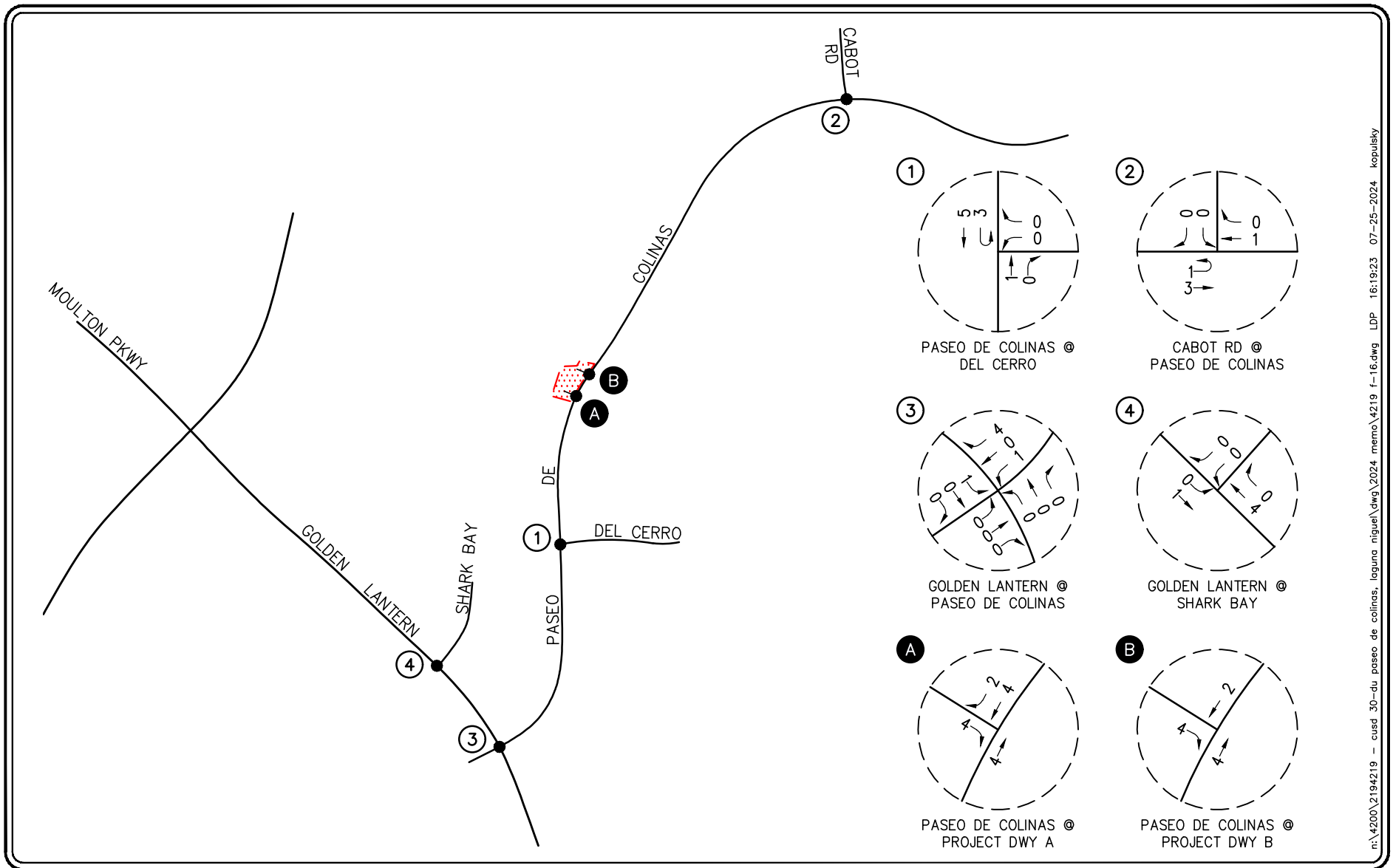


FIGURE 15

PROJECT DISTRIBUTION PATTERN
CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



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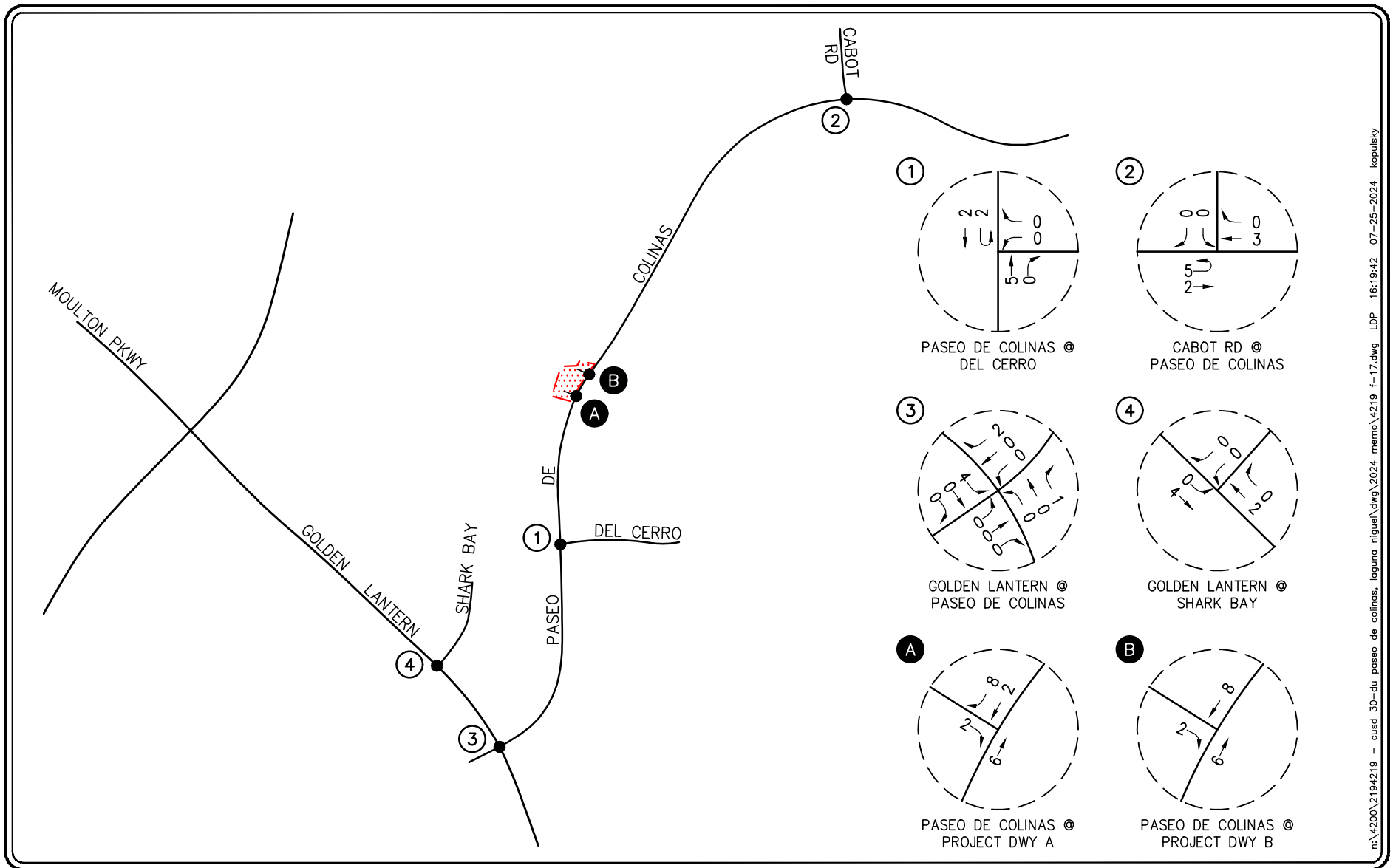
NO SCALE

KEY

- ① = STUDY INTERSECTION
- ▨ = PROJECT SITE

FIGURE 16

AM PEAK HOUR PROJECT TRAFFIC VOLUMES
 CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



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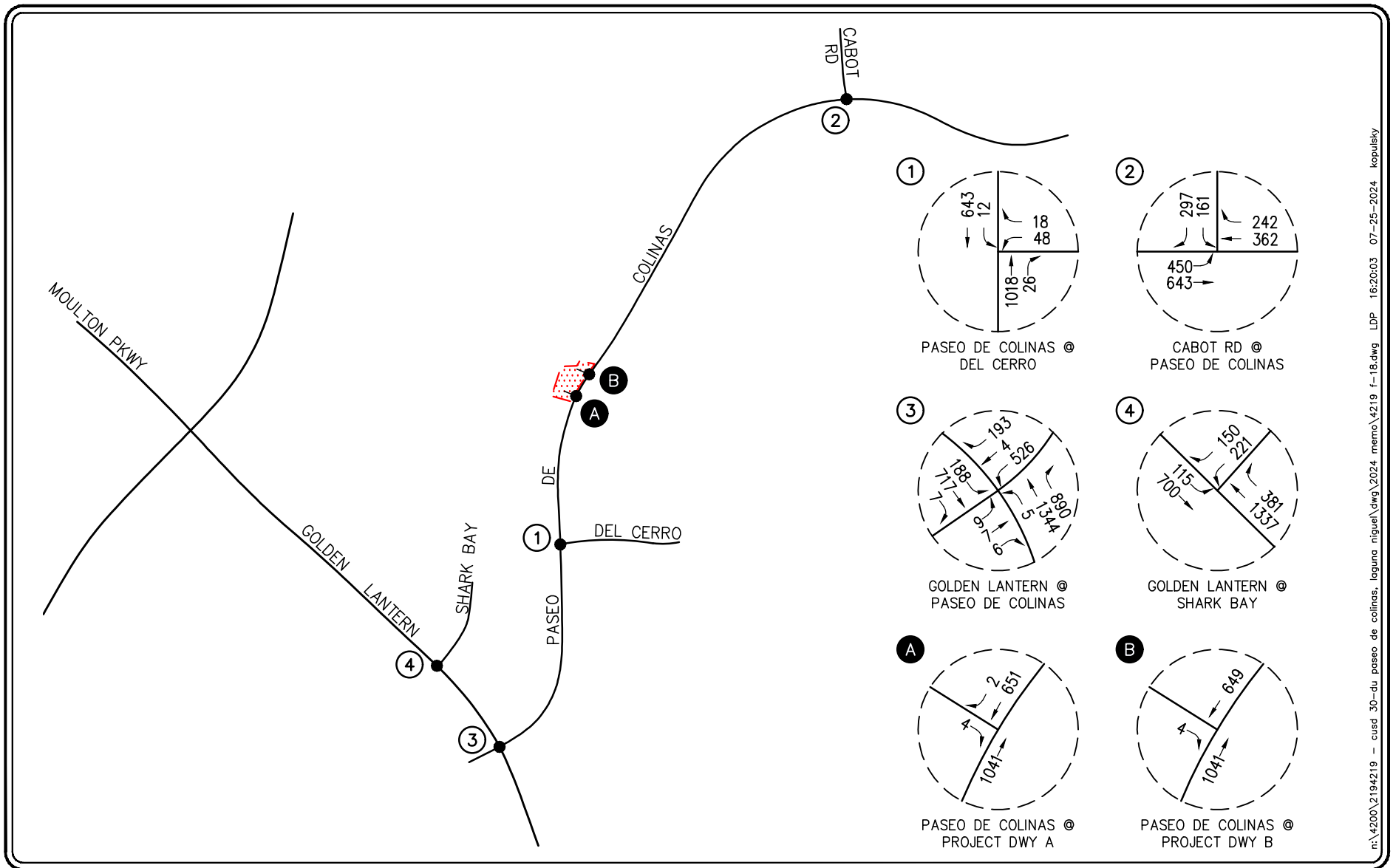
NO SCALE

KEY

- # = STUDY INTERSECTION
- = PROJECT SITE

FIGURE 17

PM PEAK HOUR PROJECT TRAFFIC VOLUMES
CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



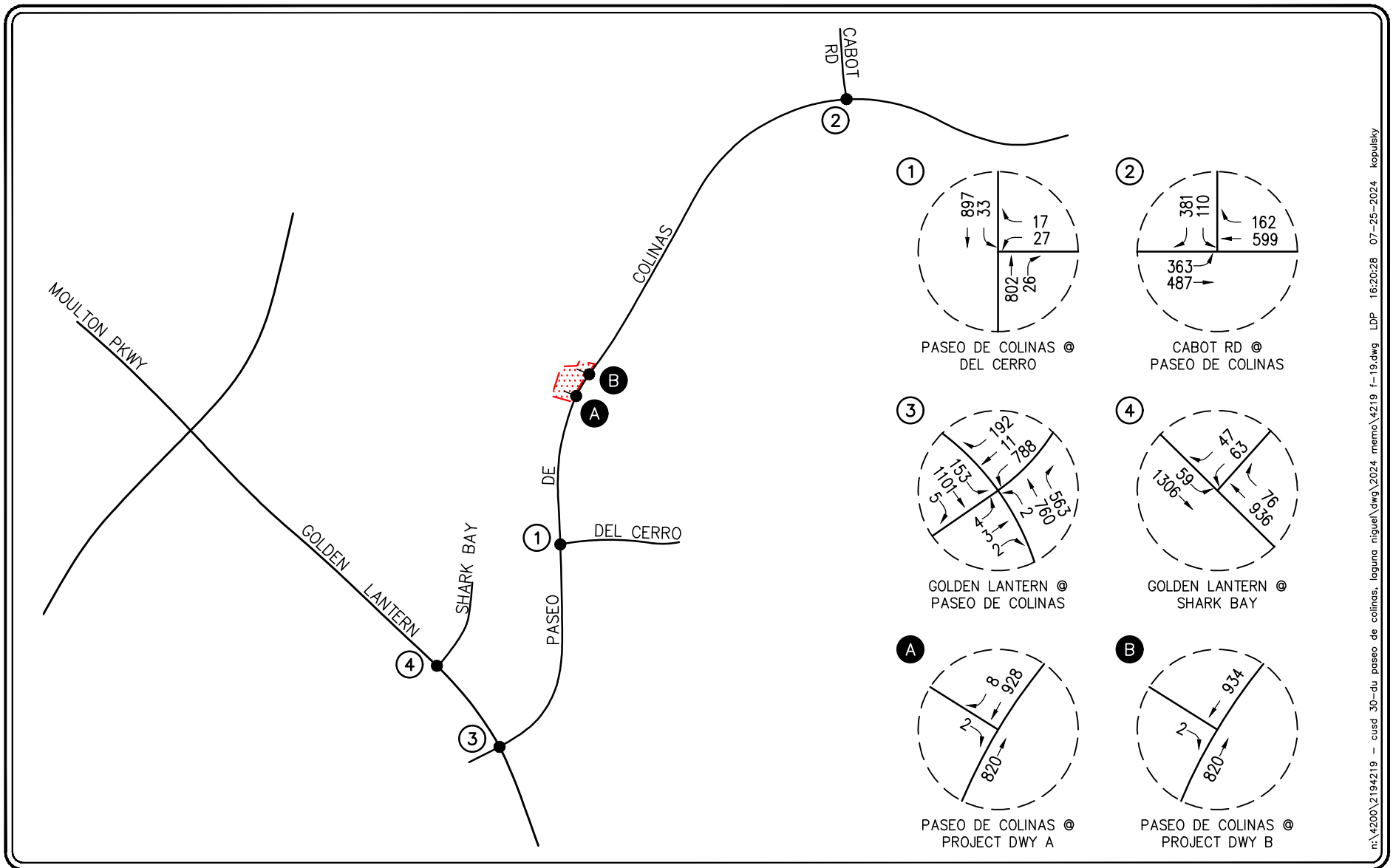
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KEY
 (#) = STUDY INTERSECTION
 [Hatched Box] = PROJECT SITE

FIGURE 18

**EXISTING PLUS PROJECT
 AM PEAK HOUR TRAFFIC VOLUMES**
 CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



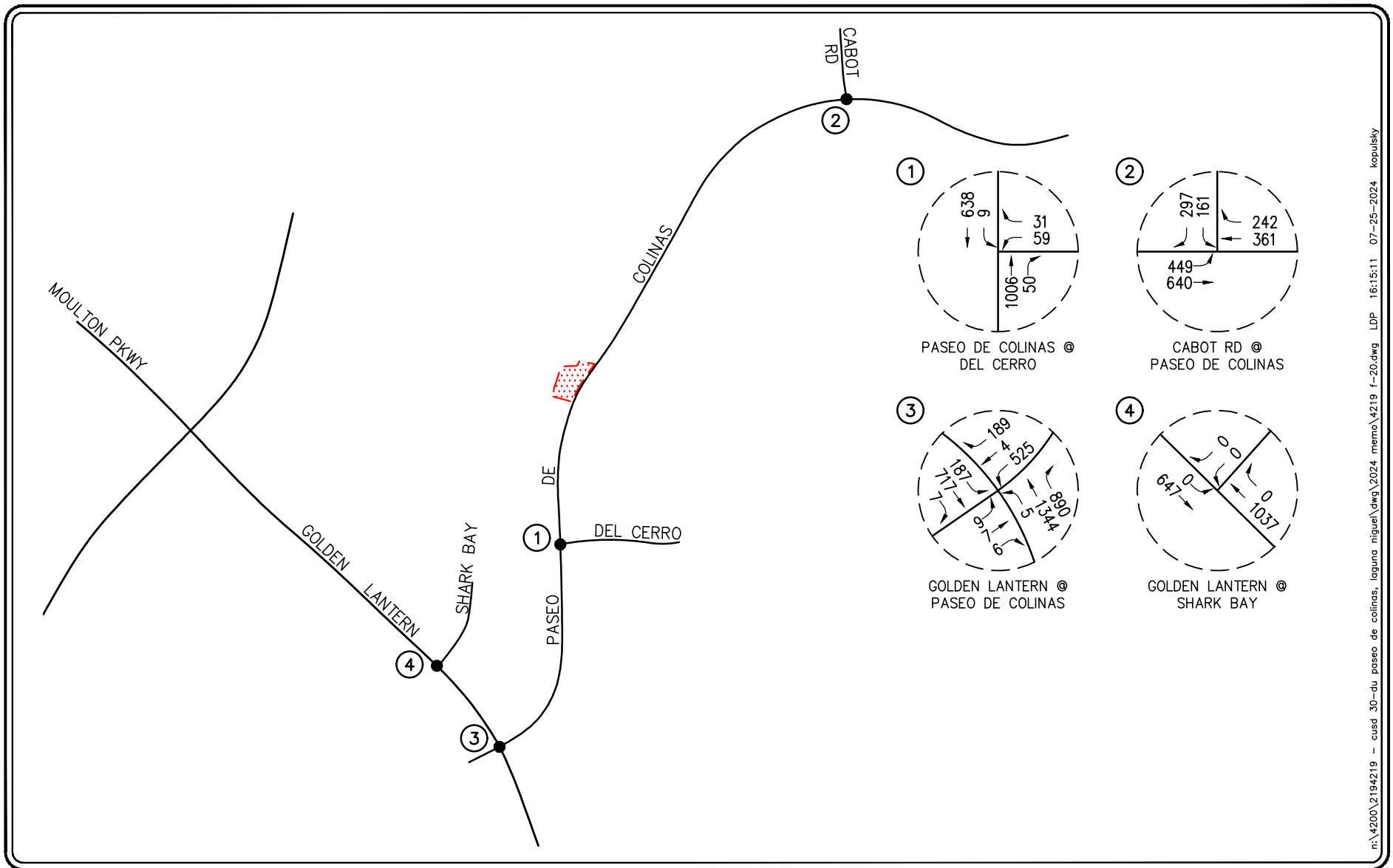
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KEY
 # = STUDY INTERSECTION
 [Red Hatched Box] = PROJECT SITE

FIGURE 19

**EXISTING PLUS PROJECT
 PM PEAK HOUR TRAFFIC VOLUMES**
 CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



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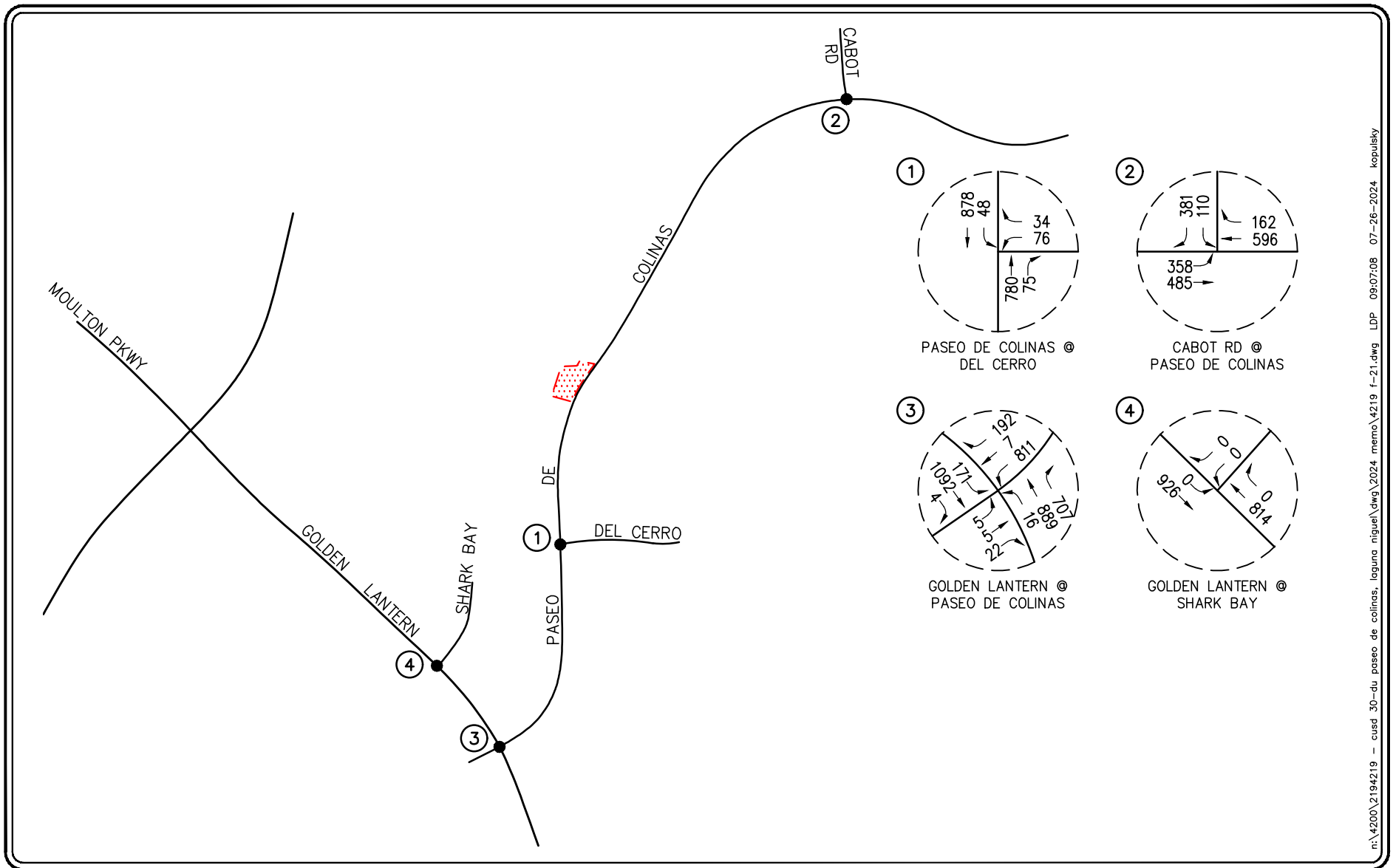
① = STUDY INTERSECTION

▨ = PROJECT SITE

FIGURE 20

**EXISTING AM DROP-OFF
PERIOD TRAFFIC VOLUMES**

CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



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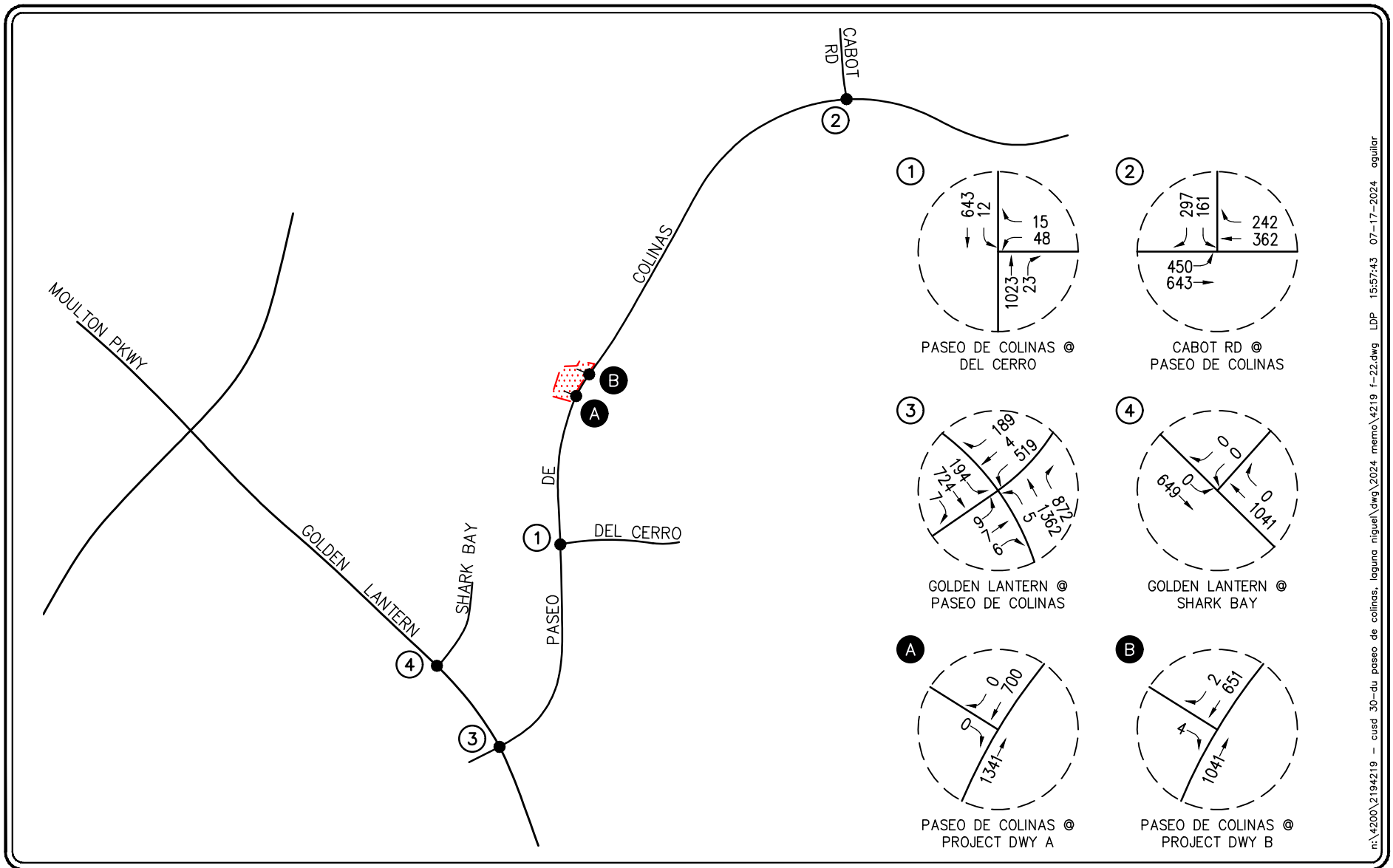
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- # = STUDY INTERSECTION
- = PROJECT SITE

FIGURE 21

EXISTING PM PICK-UP
PERIOD TRAFFIC VOLUMES

CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



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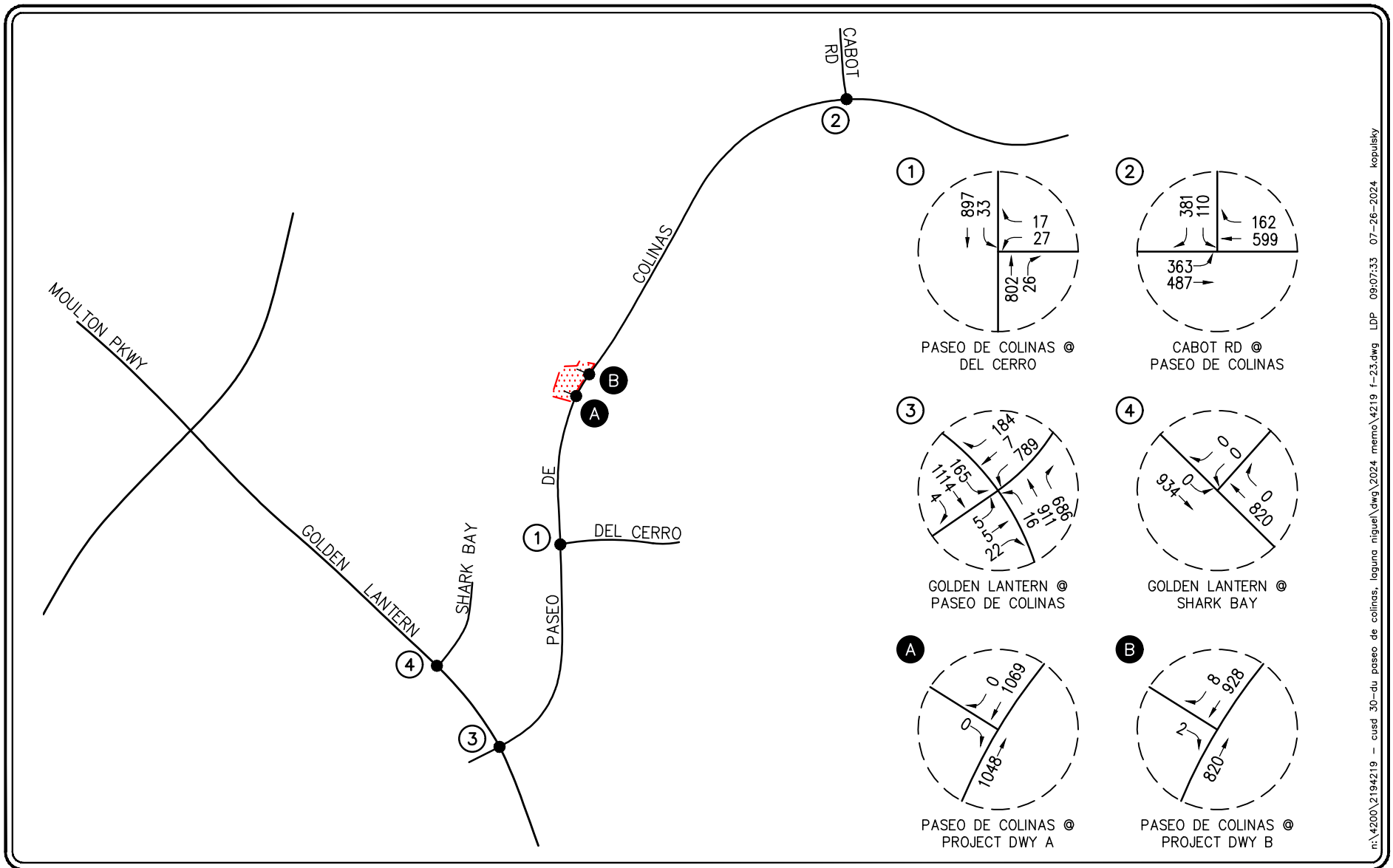


KEY
 # = STUDY INTERSECTION
 [Red hatched box] = PROJECT SITE

FIGURE 22

**EXISTING PLUS PROJECT AM DROP-OFF
PERIOD TRAFFIC VOLUMES**

CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



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KEY

① = STUDY INTERSECTION

▨ = PROJECT SITE

FIGURE 23

**EXISTING PLUS PROJECT PM PICK-UP
PERIOD TRAFFIC VOLUMES**

CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL



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FIGURE 24A

**GREEN-BIKE IMPROVEMENTS
PASEO DE COLINAS AT LOMA LINDA**
CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL

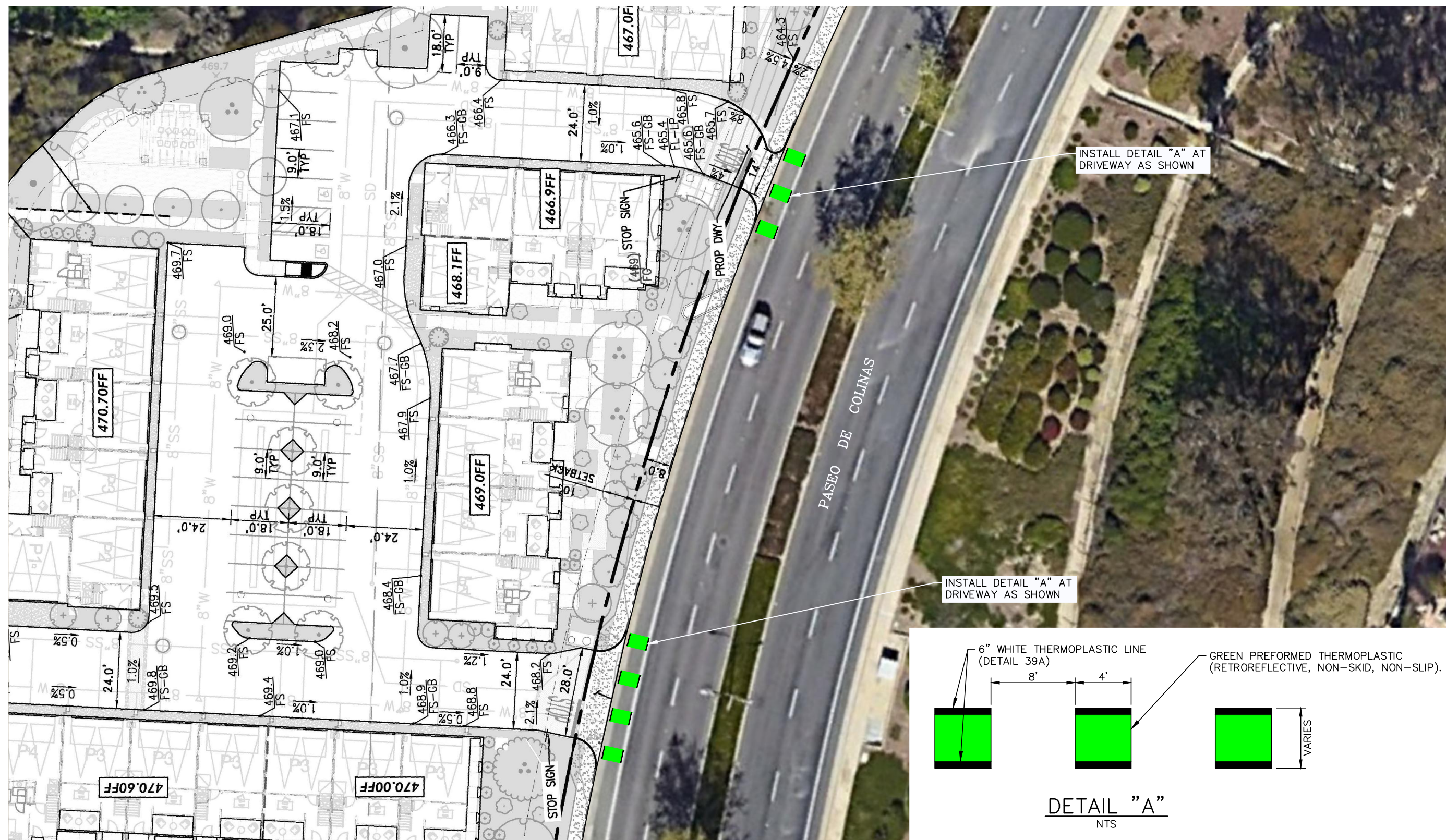


FIGURE 24B

**GREEN-BIKE IMPROVEMENTS
PASEO DE COLINAS AT PROJECT DRIVEWAYS**
CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL

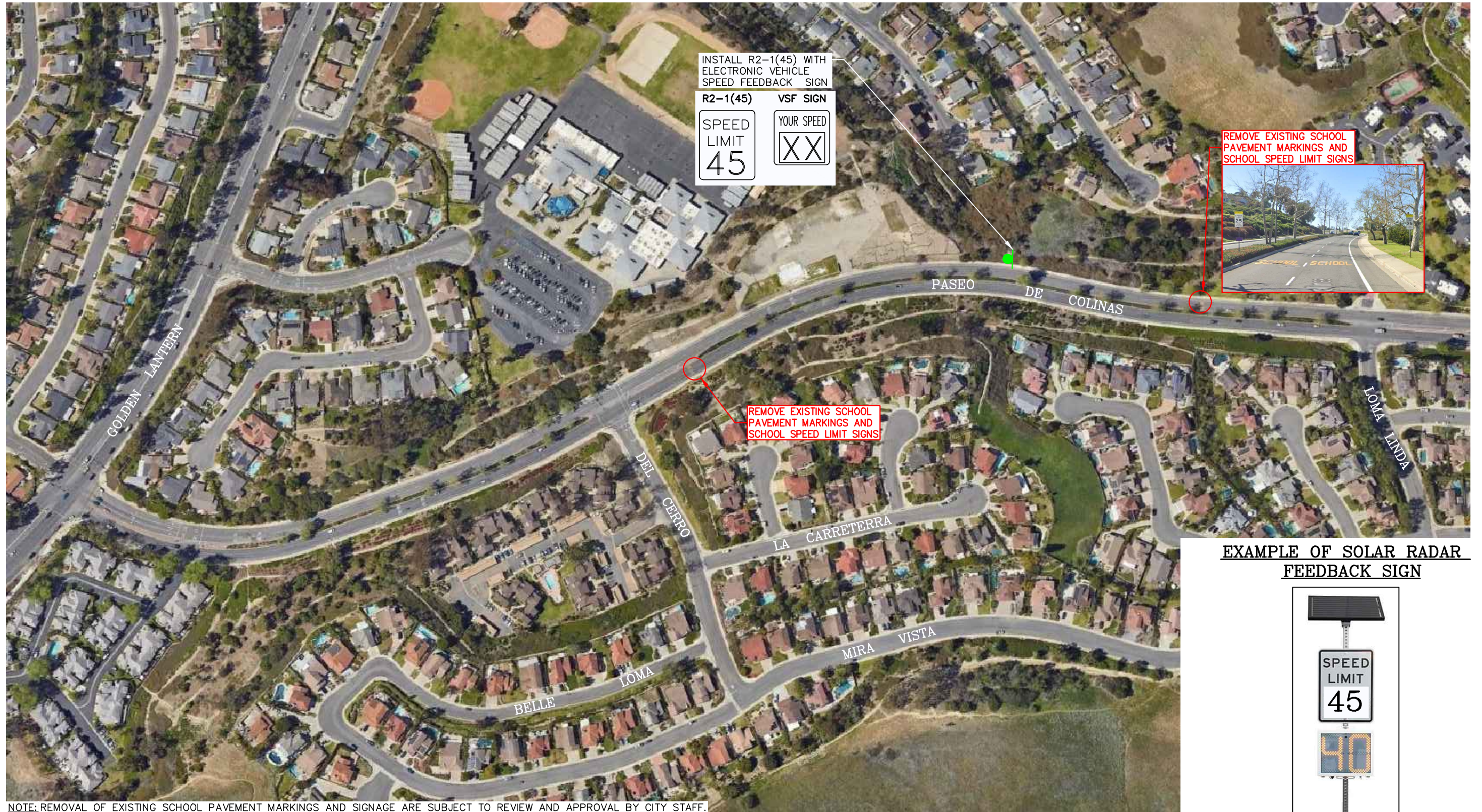


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FIGURE 24C



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FIGURE 25

POTENTIAL LOCATION OF VEHICLE SPEED FEEDBACK SIGN

CUSD 24-DU PASEO DE COLINAS, LAGUNA NIGUEL

TABLE 1
PROJECT DEVELOPMENT SUMMARY⁴

Land Use / Project Description	Project Development Totals
<u>Paseo De Colinas Townhomes</u>	
<input type="checkbox"/> 2 Bedroom / 2 Bath Units (1,236 SF – 1,259 SF)	8 Units
<input type="checkbox"/> 3 Bedroom / 2.5 Bath Units (1,617 SF)	12 Units
<input type="checkbox"/> 4 Bedroom / 3.5 Bath Units (1,930 SF)	<u>4 Units</u>
Total Residential Units:	24 Units
<u>Parking Supply</u>	
<input type="checkbox"/> Parking	
○ Garages (2 car / unit)	48 spaces
<input type="checkbox"/> Guest / Open Parking	
○ Surface Parking	<u>25 spaces</u>
Total Parking Supply:	73 spaces

⁴ Source: KTGy, Architectural Site Plan.

TABLE 2
PROJECT TRAFFIC GENERATION RATES AND FORECAST⁵

Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
<u>Trip Rates:</u>							
▪ 220: Multifamily Housing (Low-Rise ⁶) (TE/DU)	6.74	24%	76%	0.40	63%	37%	0.51
▪ 221: Multifamily Housing (Mid-Rise ⁷) (TE/DU)	4.54	23%	77%	0.37	61%	39%	0.39
<u>Project Trip Generation:</u>							
▪ 220: Paseo De Colinas 24-DU Residential Development (24 DU)	162	2	8	10	8	4	12

Notes:

TE/KSF = Trip End per 1,000 Square Feet

TE/DU = Trip End per Dwelling Unit

⁵ Source: *Trip Generation*, 11th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2021).

⁶ Low-Rise Multifamily Housing consists of buildings that range between 1 and 2 levels.

⁷ Mid-Rise Multifamily Housing consists of buildings that range between 3 and 10 levels.

TABLE 3
EXISTING WITH PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS
DURING WEEKDAY AM AND PM PEAK COMMUTE HOURS

Key Intersection	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions		(3) Significant Impact		(4) Existing Plus Project Plus Improvement	
		ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/ No	ICU/HCM	LOS
1. Paseo De Colinas at Del Cerro	AM	0.401	A	0.391	A	-0.010 ⁸	No	--	--
	PM	0.348	A	0.348	A	0.000	No	--	--
2. Cabot Road at Paseo De Colinas	AM	0.579	A	0.580	A	0.001	No	--	--
	PM	0.591	A	0.594	A	0.003	No	--	--
3. Golden Lantern at Paseo De Colinas	AM	0.847	D	0.838	D	-0.009 ⁸	No	--	--
	PM	0.706	C	0.709	C	0.003	No	--	--
4. Golden Lantern at Shark Bay	AM	0.564	A	0.589	A	0.025	No	--	--
	PM	0.325	A	0.325	A	0.000	No	--	--
5. Paseo De Colinas at Project Driveway 1	AM	--	--	10.4 s/v	B	--	--	--	--
	PM	--	--	12.0 s/v	B	--	--	--	--
6. Paseo De Colinas at Project Driveway 2	AM	--	--	10.4 s/v	B	--	--	--	--
	PM	--	--	12.0 s/v	B	--	--	--	--

Notes:

- **Bold HCM/LOS** values indicate adverse service levels based on the City's LOS standards.
- s/v = seconds per vehicle

⁸ Negative increase due to volume redistribution for closed staircase.

TABLE 4
EXISTING WITH PROJECT INTERSECTION CAPACITY ANALYSIS
DURING SCHOOL DROP-OFF AND PICK-UP PERIOD⁹

Key Intersection	Time Period	(1) Existing Traffic Conditions		(2) Existing Plus Project Traffic Conditions		(3) Significant Impact		(4) Existing Plus Project Plus Improvement	
		ICU/HCM	LOS	ICU/HCM	LOS	Increase	Yes/ No	ICU/HCM	LOS
1. Paseo De Colinas at Del Cerro	AM	0.401	A	0.393	A	-0.008 ¹⁰	No	--	--
	PM	0.374	A	0.330	A	-0.044 ⁸	No	--	--
2. Cabot Road at Paseo De Colinas	AM	0.579	A	0.580	A	0.001	No	--	--
	PM	0.596	A	0.599	A	0.003	No	--	--
3. Golden Lantern at Paseo De Colinas	AM	0.847	D	0.839	D	-0.008 ⁸	No	--	--
	PM	0.823	D	0.801	D	-0.022 ⁸	No	--	--
4. Golden Lantern at Shark Bay	AM	0.564	A	0.586	A	0.022	No	--	--
	PM	0.390	A	0.432	A	0.042	No	--	--
5. Paseo De Colinas at Project Driveway 1	AM	--	--	10.4 s/v	B	--	--	--	--
	PM	--	--	11.7 s/v	B	--	--	--	--
6. Paseo De Colinas at Project Driveway 2	AM	--	--	10.4 s/v	B	--	--	--	--
	PM	--	--	11.7 s/v	B	--	--	--	--

Notes:

- **Bold HCM/LOS** values indicate adverse service levels based on the City's LOS standards.
- s/v = seconds per vehicle

⁹ School peak drop-off and pick-up times are 7:00 AM – 8:00 AM and 3:00 PM – 4:00 PM.

¹⁰ Negative increase due to volume redistribution for closed staircase.

TABLE 5
EXISTING WITH PROJECT PEAK HOUR INTERSECTION QUEUING ANALYSIS¹¹
DURING WEEKDAY AM AND PM PEAK COMMUTE HOURS

Key Intersection	Storage Provided (feet)	(1) Existing Traffic Conditions				(2) Existing Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)
1. Paseo De Colinas at Del Cerro <i>Southbound Left-Turn</i>	160	25	Yes	36	Yes	25	Yes	39	Yes
2. Cabot Road at Paseo De Colinas <i>Eastbound Left-Turn</i>	475	479	Yes ¹²	334	Yes	480	Yes ¹²	340	Yes

¹¹ Queues are based on HCM 95th Percentile methodology.

¹² Although the anticipated queue exceeds the striped storage, the spillover queue can be accommodated within the transition area.

TABLE 6
EXISTING WITH PROJECT PEAK HOUR INTERSECTION QUEUING ANALYSIS¹³
DURING SCHOOL DROP-OFF AND PICK-UP PERIOD¹⁴

Key Intersection	Storage Provided (feet)	(1) Existing Traffic Conditions				(2) Existing Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)
1. Paseo De Colinas at Del Cerro <i>Southbound Left-Turn</i>	160	25	Yes	56	Yes	25	Yes	39	Yes
2. Cabot Road at Paseo De Colinas <i>Eastbound Left-Turn</i>	475	479	Yes ¹⁵	364	Yes	480	Yes ¹⁵	369	Yes

¹³ Queues are based on HCM 95th Percentile methodology.

¹⁴ School peak drop-off and pick-up times are 7:00 AM – 8:00 AM and 3:00 PM – 4:00 PM.

¹⁵ Although the anticipated queue exceeds the striped storage, the spillover queue can be accommodated within the transition area.

