

APPENDIX J

Vehicle Miles Traveled Analysis



TECHNICAL MEMORANDUM

To: Ms. Julie Beeman
VCS Environmental

Date: March 21, 2024

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LLG Ref: 2.21.4488.1

Subject: ***Vehicle Miles Traveled (VMT) Analysis for the Proposed JD Ranch Residential Project, Norco***

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As requested, Linscott, Law & Greenspan, Engineers (LLG) is pleased to submit this Vehicle Miles Traveled (VMT) Analysis Technical Memorandum for the proposed JD Ranch Residential project (herein after referred to as “Project”) in the City of Norco, Riverside County, California. This Technical Memorandum presents the VMT screening criteria, analysis methodology, significance thresholds and VMT analysis. It should be noted that the approach and methodology outlined in this Technical Memorandum is consistent with the *City of Norco Resolution No.2020-62 – Vehicle Miles Travelled Impact (dated September 2, 2020)*, which provides additional detail on the language and analysis procedures described in this Technical Memorandum.

The following sections of this Technical Memorandum summarize the Project description, present City of Norco’s VMT screening criteria, analysis methodology, thresholds and VMT analysis.

PROJECT DESCRIPTION

The Project site is located on the southeast quadrant of River Road and Bluff Street. Based on our understanding, the property appears to be developed as a former dairy with a residence and outbuildings on its southern border (River Road access site). The balance of the property holds pole barns, pasture, and vacant land.

The proposed Project will consist of sixty-eight (68) single family dwelling units with one (1) existing single family dwelling unit to remain. Access for the proposed Project will be provided via one (1) full-movement driveway along River Road Nuevo Road aligned with Trail Street and one (1) full-movement driveway along Bluff Street.

Figure 1 presents a vicinity map for the Project site. **Figure 2** presents an existing aerial of the Project site. **Figure 3** presents the conceptual site plan for the proposed Project, prepared by *MDS Consulting*.

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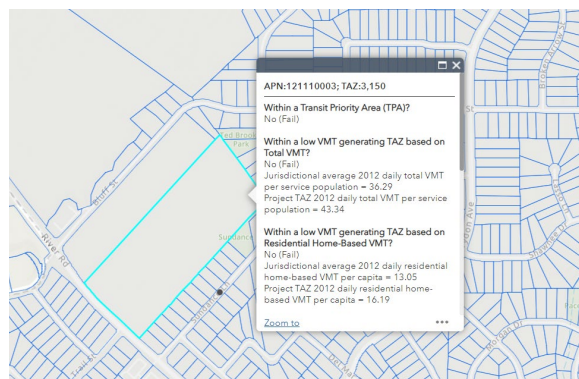
PROJECT SCREENING CRITERIA

Project screening is used to determine if a project will be required to conduct a detailed VMT analysis. The following section discusses the screening methods outlined in the *City of Norco Resolution No.2020-62 – Vehicle Miles Travelled Impact (dated September 2, 2020)* for land use projects and outlines whether the Project will screen-out, either in its entirety, or partially based on individual land uses. The *City of Norco Resolution No.2020-62 – Vehicle Miles Travelled Impact (dated September 2, 2020)* states:

“The City of Norco hereby adopts the VMT Project Screening Criteria consistent with OPR guidelines and screen out projects which fall into the following categories:

- *Retail projects up to 50,000 SF in floor area.*
- *Projects generating less than 110 daily trips.*
- *Projects within a Transit Priority Area (TPA). A TPA is defined as locations within ½ mile of a major transit stop or within ½ mile of a high-quality transit corridor with 15-minute or less headways during peak commute hours.*
- *Affordable housing developments or affordable housing units within mixed-use developments.*
- *Transportation projects that promote non-auto travel, improve safety, or improve traffic operations at current bottlenecks, such as transit, bicycle and pedestrian facilities, intersection traffic control (e.g., traffic signals or roundabouts), or widening at intersections to provide new turn lanes.*

*Based on the above, the proposed Project **will not** screen-out since it is not listed in the above land use categories and as presented in the screenshot below from the Western Riverside Council of Governments (WRCOG) VMT Screening Tool Website¹.*



Screenshot – Project TAZ Screening Based on WRCOG VMT Screening Tool

¹ <https://apps.fehrandpeers.com/WRCOGVMT/>



VEHICLE MILES TRAVELED (VMT) SIGNIFICANCE THRESHOLDS

As previously discussed, a project that does not meet the screening criteria will require preparation of a detailed transportation analysis. The VMT significance criteria as stated in the *City of Norco Resolution No.2020-62 – Vehicle Miles Travelled Impact (dated September 2, 2020)* is detailed below:

City of Norco VMT Baselines and Thresholds of Significance

Project Type	Thresholds
Land Use Plan	1) Project Impact: A significant impact would occur if the VMT rate for the plan would exceed the applicable baseline VMT rate per service population. 2) Cumulative Project Effect: A significant impact would occur if the Project increases total regional VMT compared to cumulative no project conditions.
Land Use Project (Residential)	1) Project Impact: A significant impact would occur if the VMT rate for the Project would exceed the daily total VMT per service population; OR 2) Project Impact: A significant impact would occur if the VMT rate for the project would exceed daily residential home-based VMT per capita. 3) Cumulative Project Effect: A significant impact would occur if the project would exceed the total regional VMT compared to cumulative no project conditions, under either condition above.
Office, Commercial, or Retail Land Use Project	1) Project Impact: A significant impact would occur if the VMT rate for the project would exceed the applicable baseline VMT rate per service population; OR 2) Project Impact: A significant impact would occur if the VMT rate for the Project would exceed daily home-based work VMT per worker. 3) Cumulative Project Effect: A significant impact would occur if the Project increases the VMT rate in the study area above the baseline conditions for that area.
Transportation Project	A significant impact would occur if the Project causes a net increase in total regional VMT compared to baseline conditions, opening year no project conditions, or cumulative no project conditions.
All Land Use and Transportation Projects	A significant impact would occur if the Project is inconsistent with the RIVTAM/RIVCOM.

Please note that the Baseline VMT rate is defined as the City’s jurisdictional average VMT per appropriate development category.



VEHICLE MILES TRAVELED (VMT) ANALYSIS METHODOLOGY

According to *City of Norco Resolution No.2020-62 – Vehicle Miles Travelled Impact (dated September 2, 2020)*, projects that do not screen out based on the aforementioned criteria shall complete a full VMT analysis and forecasting using the Riverside County Traffic Analysis Model (RIVTAM/RIVCOM) to determine if it will have a significant VMT impact.

Based on the above, a full VMT analysis utilizing RIVTAM has been used to determine the VMT for Project and for the City of Norco average and will provide the following:

- Daily Home-based VMT per Capita
- Total Regional VMT

VEHICLE MILES TRAVELED (VMT) ANALYSIS

Summarized below are the average VMT per Capita values utilizing RIVTAM for the City of Norco and for the proposed Project. It should be noted that the Project is located in Traffic Analysis Zone (TAZ) 3150 and the Project development totals were converted into Socio-Economic Data (SED) and inputted into the RIVTAM. **Figure 4** presents the TAZ map from RIVTAM.

Project Impact

As shown below, the proposed Project VMT per Capita is **22.50%** higher the City average VMT per Capita. Based on the criteria outlined in this report, the proposed Project will exceed the City of Norco base year VMT per Capita of 13.05 and thus will have a significant Project VMT impact.

Project Threshold			
Base Year	TAZ 3150	City Average (Threshold)	Compare to City Threshold
VMT per Capita	15.99	13.05	22.50% Higher

Cumulative Project Effect

As shown below, the proposed Project total daily VMT within the City is **0.10%** higher than the “no Project” scenario total daily VMT under cumulative conditions. Based on the criteria outlined in this report, the proposed Project total daily VMT will exceed under the “with Project” condition when compared to the “without Project” condition and thus the Project will have a significant cumulative VMT impact.



Cumulative Threshold			
Cumulative Year	With Project Scenario	Without Project Scenario (Threshold)	Compare to Threshold
Total VMT	1,164,288.81	1,163,127.15	0.10% Higher

It should be noted that as previously mentioned and according to the *City of Norco Resolution No.2020-62 – Vehicle Miles Travelled Impact (dated September 2, 2020)*, while the Project is consistent with the *Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)*, the Project exceed the total regional VMT compared to cumulative no project conditions, thus the cumulative impacts are considered to be significant.

VEHICLE MILES TRAVELED (VMT) MITIGATION MEASURES

If a significant VMT impact is identified, measures to reduce the Project’s VMT impact should be identified to reduce the VMT levels to a level at or below the City’s thresholds. To mitigate VMT impacts, the project applicant must reduce VMT, which can be done by either reducing the number of automobile trips generated by the project or by reducing the distance that people drive. The following strategies are available to achieve this:

1. Modify the project’s build environment characteristics to reduce VMT generated by the project.
2. Implement Transportation Demand Management (TDM) measures to reduce VMT generated by the project.

Strategies that reduce single-occupant automobile trips or reduce travel distance are called TDM strategies. There are several resources for determining the reduction in VMT due to TDM measures such as the CAPCOA Quantifying Greenhouse Gas Mitigation Measures.

As referenced in the *OPR Technical Advisory*, the California Air Pollution Control Officers Association’s *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity, Designed for Local Government, Communities, and Project Developers Report*, Chapters 3 - Transportation, December 2021, (CAPCOA Report) quantifies the reduction in vehicle miles traveled (VMT) associated with a particular mitigation measure. The CAPCOA VMT reduction strategies include built environment changes and transportation demand management (TDM) actions.

The TDM strategies are sub-categorized into the following:

- 1) Land Use
- 2) Trip Reduction Program
- 3) Parking or Road Pricing/Management
- 4) Neighborhood Design
- 5) Transit
- 6) Clean Vehicles and Fuels

It may be noted that there are rules and combined maximums for calculating the VMT reduction when applying multiple mitigation measures. To safeguard the accuracy and reliability of the methods while maintaining their case of use, the following rules should be followed when considering reductions achieved by transportation measures.

Combining Measures Across Scales

According to the CAPCOA, there are sixteen (16) quantified measures at the Project/Site scale that can be applicable and seventeen (17) quantified measures at the Plan/Community scale that can be applicable. *The GHG reductions of transportation measures from different scales of application should never be combined.*

Combining Measures Within a Subsector

Effectiveness levels for multiple measures within a subsector may be multiplied to determine a combined effectiveness level. The CAPCOA recommends that measures reductions within a subsector be multiplied. This will take the following form:

$$Reduction_{subsector} = 1 - [(1 - A) * (1 - B) * (1 - C)]$$

Where A, B, and C are the individual measures reduction percentages for the measures to be combined in each subsector. In addition, each subsector has a maximum allowable reduction.

Combining Measures Across Subsectors

The CAPCOA report adopts 70 percent as a maximum for the combined VMT impact from the following four subsectors: Land Use, Neighborhood Design, Parking or Road Pricing/Management, and Transit:

$$Reduction_{multi-subsector} = 1 - [(1 - Land) * (1 - Design) * (1 - Parking) * (1 - Transit)] \leq 70\%$$



Please note that this multi-subsector maximum purposefully excludes the Trip Reduction Program subsector.

Recommended Mitigation Measures

The recommended mitigation measures for the Project type of residential with the project locational Context of suburban, consist as the following:

- T-1 (Increase Residential Density): up to 30% maximum VMT reduction.
- T-18 (Provide Pedestrian Network Improvement): up to 6.4% maximum VMT reduction.
- T-42 (Implement Telecommute and/or Alternative Work Schedule Program)

1) T-1: Increase Residential Density

This measure accounts for the VMT reduction achieved by a project that is designed with a higher density of dwelling units (DU) compared to the average residential density in the U.S. Increased densities affect the distance people travel and provide greater options for the mode of travel they choose. Increasing residential density results in shorter and fewer trips by single-occupancy vehicles and thus a reduction in GHG emissions. This measure is best quantified when applied to larger developments and developments where the density is somewhat similar to the surrounding area due to the underlying research being found in data from the neighborhood level.

The proposed Project TAZ area is 1,120 acres. The “with” Project scenario will have 320 DU, while the “Without” Project scenario has 252 DU. The CAPCOA T-1 formula was applied accordingly, as shown below:

$$VMT\ Reduction = \frac{\frac{320\ DU}{1,120\ Acre} - \frac{252\ DU}{1,120\ Acre}}{\frac{252\ DU}{1,120\ Acre}} * -0.22 = 5.9\%$$

Based on the above, after considering that the Project would support and contribute to a greater residential density in the TAZ where the Project is located, the Project’s VMT could reasonably be reduced by **5.9%** (less than the CAPCOA’s maximum reduction 30%).

T-18. Provide Pedestrian Network Improvement

According to CAPCAO, this measure will increase the trail coverage to improve pedestrian access. Providing trails and an enhanced pedestrian network encourages people to walk instead of drive. This mode shift results in a reduction in VMT and GHG emissions.



The CAPCOA T-18 formula was applied accordingly, as shown below:

$$VMT\ Reduction = \left(\left[\frac{1.28}{0.40} \right] - 1 \right) * -0.05 = 11\%$$

The 1.28 value in the numerator represents the trail length in study area with measure and the 0.40 value in the denominator represents the existing trail length in study area. Based on the above, the Project's VMT could reasonably be reduced by **6.4%** (equal to CAPCOA's maximum VMT reduction of 6.4%).

T-42. Implement Telecommute and/or Alternative Work Schedule Program

According to CAPCAO, this measure requires projects to permit employee telecommuting and/or alternative work schedules and monitor employee involvement to ensure forecasted participation matches observed participation.

The VMT results are based on data derived from RIVTAM. It is noted that while RIVTAM takes into account a wide variety of socio-economic data, including factors such as household size, income, as well as aspects of travel mode choices, etc., it may not account for all factors that affect travel behavior in the Riverside County region. Specifically, the effect of telework or remote work on VMT generation and therefore the VMT forecasts.

Telework refers to the practice of working from home or other remote locations by using telecommunications services such as the internet and phone services to connect to a central office or place of business. As presented in the *Employment & Travel Survey Summary Report on Pandemic Impacts (December 14, 2021)*, prepared by True North Research, the Orange County Transportation Authority (OCTA) determined based on an employment travel survey that in February 2020, an average of 0.76 days per five-day work week, or 15.1% of working days were worked remotely via teleworking. OCTA further found that teleworking increased to an average of 2.56 days per work week, or 52.8% of working days, in response to the COVID-19 pandemic, although surveyed employees expected to telework 1.55 days per work week on average, or 31.2% of working days, in post-pandemic conditions. It is therefore expected that the percentage of employees teleworking will remain elevated in the post-pandemic period. It should be noted that data was not available for Riverside County.

Based on information provided by the Project Applicant, it is understood that the proposed Project is designed to accommodate the teleworking needs of future residents through features, technology, finishes and filters that help contribute to improved working conditions, increased convenience, healthier indoor air quality, and energy efficiency. The proposed residential units are planned and sized appropriately



to provide dedicated home office spaces (e.g., through the inclusion of home office rooms, home office lofts, and home office nooks), and the proposed development is planned to provide high-speed internet connections to each residential unit as well as high speed internet and Wi-Fi network infrastructure within each unit. The residential units will also feature additional data connections, power outlets and USB charging outlets which will facilitate the use of teleworking equipment, along with smart home technology such as smart thermostats, locks and video doorbells. In addition, the Project Applicant will provide modern internet routers in each unit in order to facilitate and enhance future residents' ability to telework. The residential units will also promote healthy indoor environments for teleworking residents by providing all electric appliances, advanced technology HVAC air filters, and low VOC interior finishes. The units will also include energy efficient features such as low E glass, smart thermostats, Energy-Star appliances, LED lighting, and tankless water heaters, which will reduce future residents' energy demands. Therefore, the proposed residential development will increase the number of residential units in the region which are well-suited to accommodate the space, technology, indoor environmental conditions and energy demands of telework. It should also be noted that other areas within the residential building will have dedicated workspaces for residents to utilize.

Employed residents of the proposed Project are expected on average to reflect the same regional teleworking trends as post-pandemic conditions. As stated previously, according to the OCTA survey, employees expected to work remotely via telework 1.55 days per work week on average, or 31.2% of working days, in post-pandemic conditions, which corresponds to a 31.2% reduction in home-based work trips. However, it is noted that this reduction in commute trips does not result in a 31.2% reduction in household VMT. Rather, home-to-work commute trips account for approximately 41% of all residential vehicle miles in the region. Therefore the forecasts for residential VMT may be adjusted downward to 12.79% (i.e. 41% of all residential VMT x 31.2% reduction in home-to-work commute trips = 12.79% reduction in total residential VMT) in order to reflect the effect of teleworking in the region.). However, given that the RIVTAM model may include factors that affect travel behavior in the Riverside County region, we conservatively recommend 50% of the VMT reduction at **6.40%**.

Total Combined VMT Reduction Calculation

Based on the combined implementation of the recommended VMT impact mitigation measures described above, the total VMT reduction will be:

$$\begin{aligned} \text{Total VMT Reduction} &= 1 - (1 - T1) * (1 - T18) * (1 - T42) \\ &= 1 - (1 - 5.9\%) * (1 - 6.40\%) * (1 - 6.40\%) = \mathbf{17.56\%} \end{aligned}$$



Consequently, while mitigation measures have been identified, the above mitigations, which equates to a 17.56% reduction, will not completely offset the Project's VMT impact of 22.5%.

CONCLUSION

Consistent with the *City of Norco Resolution No.2020-62 – Vehicle Miles Travelled Impact (dated September 2, 2020)* and based on the VMT methodology, criteria, guidelines, thresholds, and results outlined in this Technical Memorandum, the proposed Project will have a significant Project VMT impact for the baseline condition even with implementation of the recommended VMT mitigation measures outlined in this memorandum. It should be noted that the Cumulative Project Effect on VMT is mitigated to a less than significant level with implementation of the recommended VMT mitigation measures outlined in this memorandum

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We appreciate the opportunity to provide this Technical Memorandum. Should you have any questions regarding the memorandum, please contact us at (949) 825-6175.

Attachments

cc: file





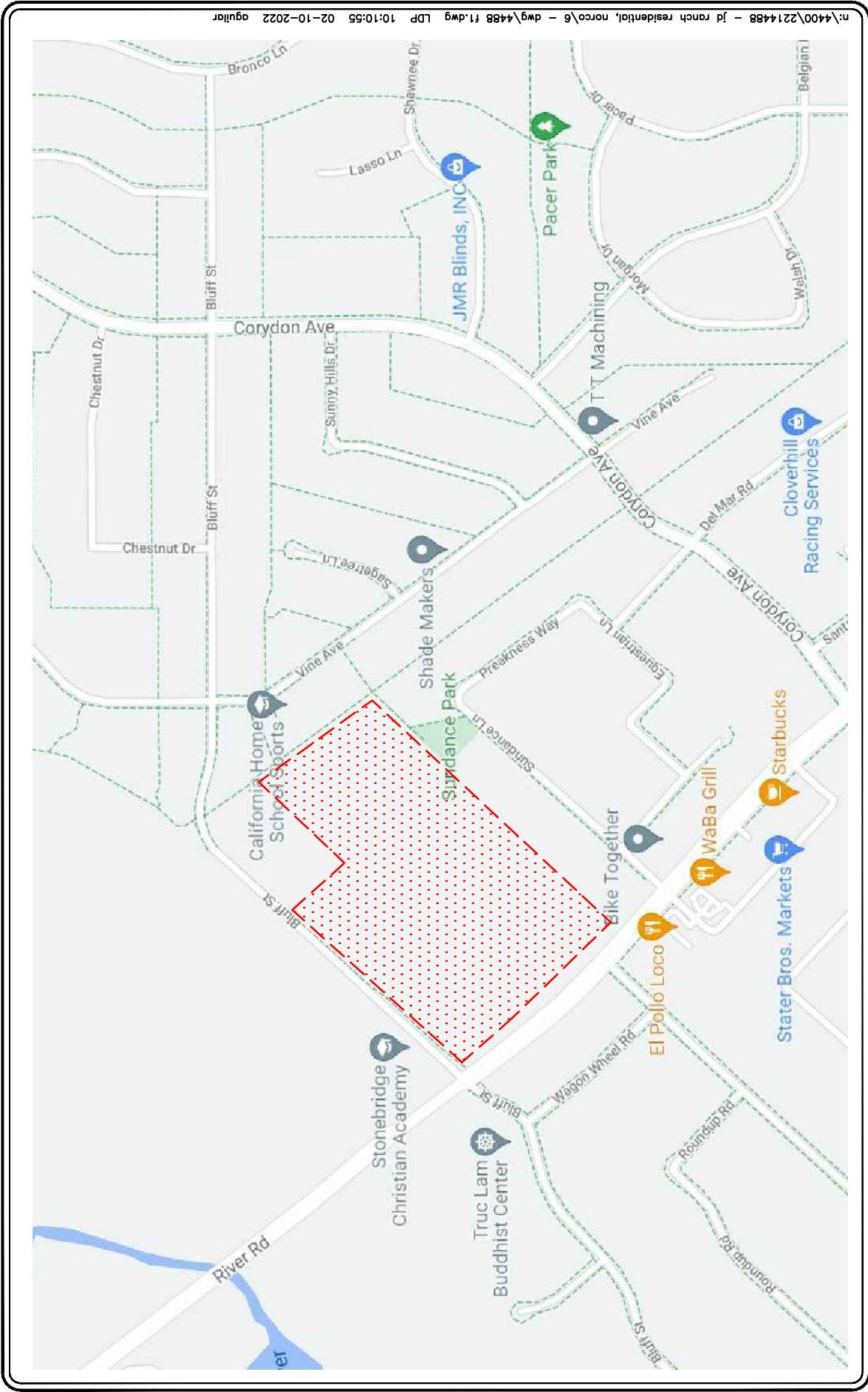
TABLE 1
PROJECT TRAFFIC GENERATION RATES AND FORECAST²

ITE Land Use Code / Project Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
<u>Generation Rates:</u>							
▪ 210: Single Family Detached Housing (TE/DU)	9.43	25%	75%	0.70	63%	37%	0.94
<u>Proposed Project Trip Generation Forecast:</u>							
• Single Family Detached Home (68 DU)	641	12	36	48	40	24	64
Project Trip Generation Forecast	641	12	36	48	40	24	64

Note:

- TE/DU = Trip end per dwelling unit

² Source: *Trip Generation, 11th Edition*, Institute of Transportation Engineers, (ITE) [Washington, D.C. (2021)].



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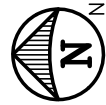
FIGURE 1

VICINITY MAP

JD RANCH RESIDENTIAL, NORCO

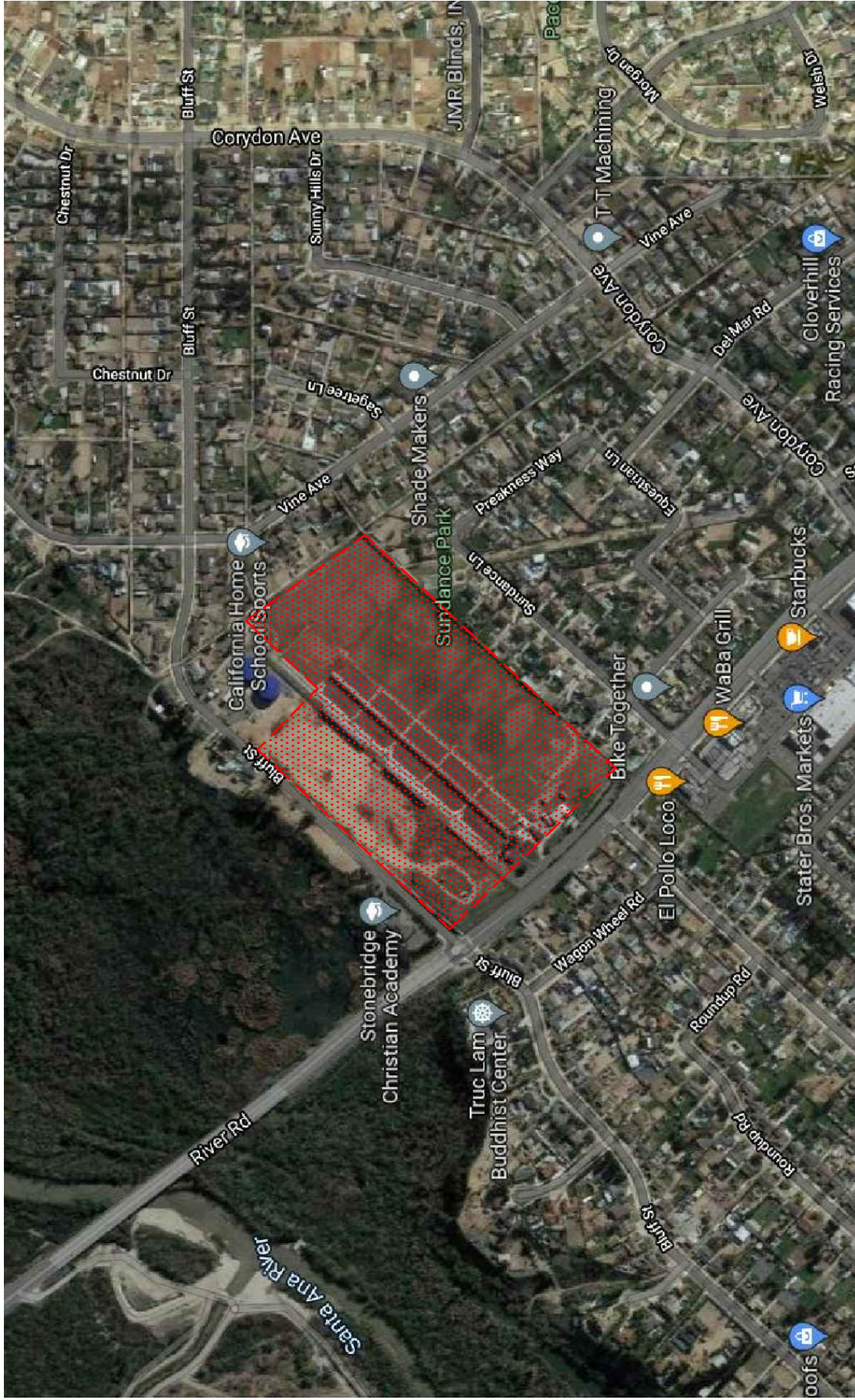
SOURCE: GOOGLE

KEY
 = PROJECT SITE



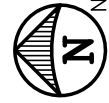
NO SCALE

LINSCOTT
LAW &
GREENSPAN
engineers



SOURCE: GOOGLE

KEY
 = PROJECT SITE



NO SCALE

LINSCOTT
 LAW &
 GREENSPAN
 engineers

FIGURE 2

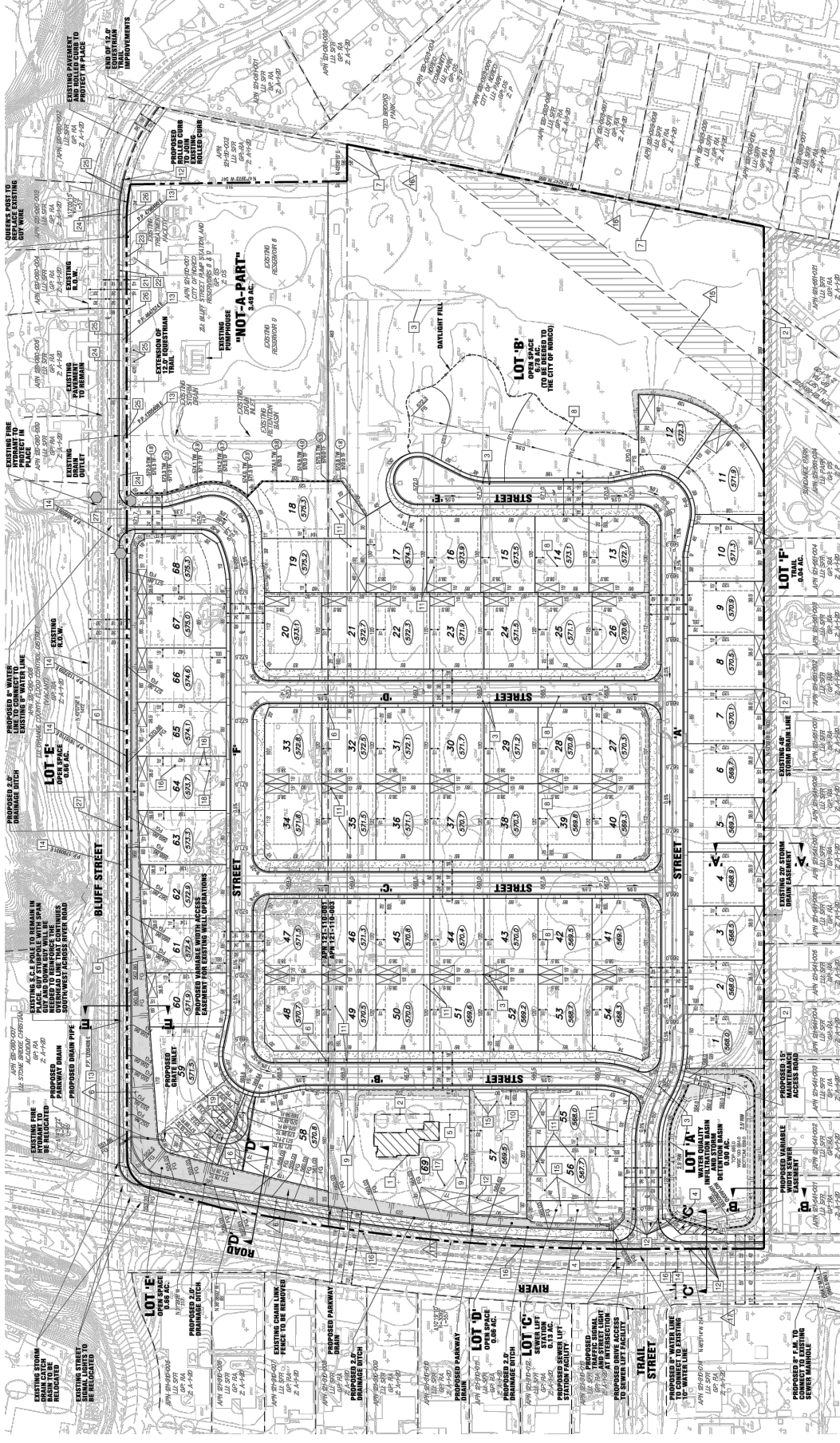
EXISTING SITE AERIAL
 JD RANCH RESIDENTIAL, NORCO

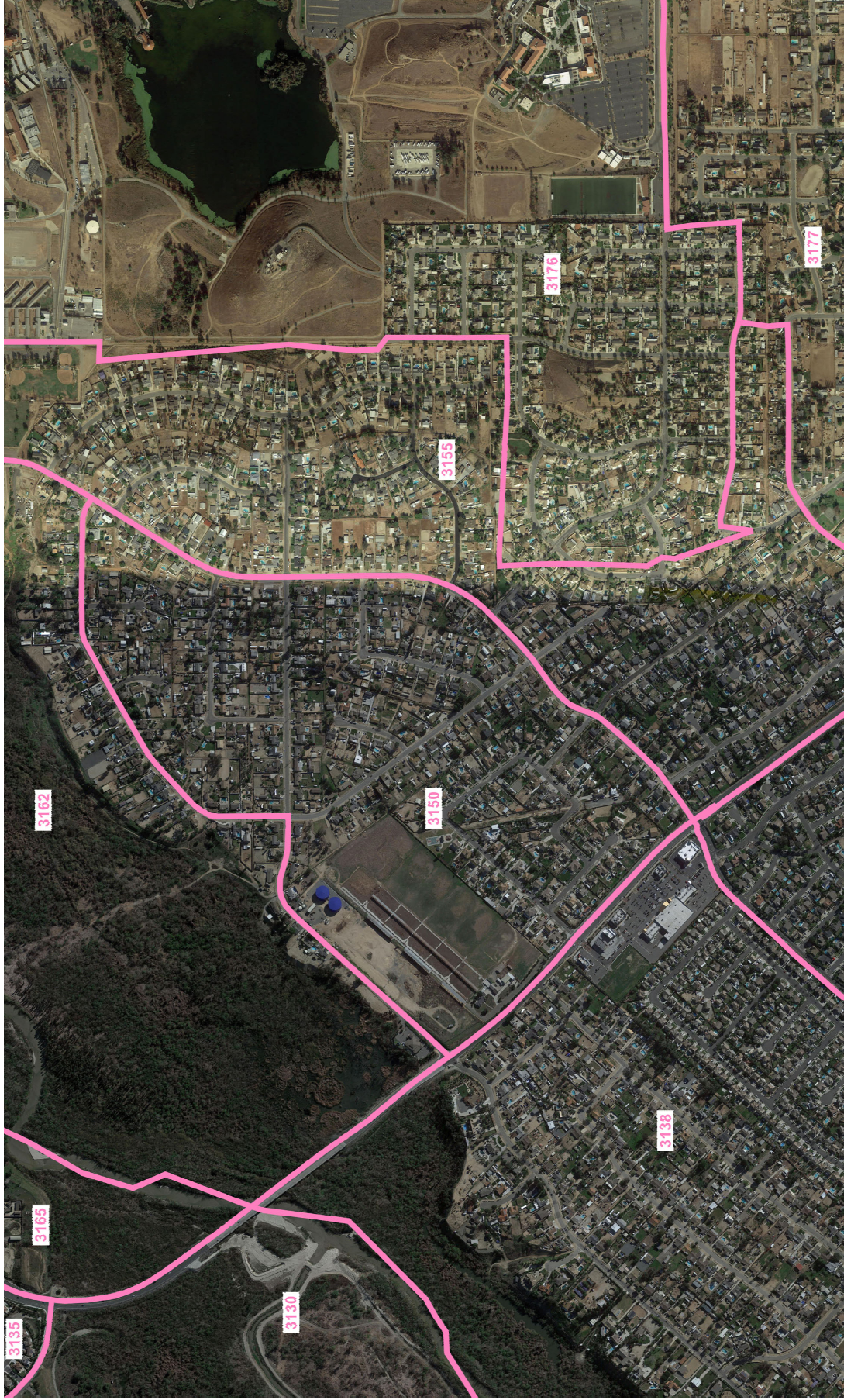
FIGURE 3 PROPOSED SITE PLAN JD RANCH RESIDENTIAL, NORCO

SOURCE: MDS CONSULTING

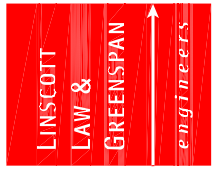


NO SCALE





SOURCE: RIVTAM



NO SCALE

FIGURE 4

TAZ MAP

JD RANCH RESIDENTIAL, NORCO