



# memorandum

**DATE:** June 28, 2023  
**TO:** Nicholas Lowe, PE  
**FROM:** Sandipan Bhattacharjee, PE, TE, AICP, ENV-SP  
**SUBJECT:** Vernola Ranch Specific Plan – VMT Analysis

Translutions, Inc. (Translutions) is pleased to provide this memorandum discussing the Vehicle Miles Traveled (VMT) evaluation for the proposed Vernola Ranch Planned Residential Community (Project) in the City of Jurupa Valley (City). This report is intended to satisfy the requirements for a VMT analysis established by the City as well as the requirements for the disclosure of potential impacts and mitigation measures per the California Environmental Quality Act (CEQA).

## PROJECT DESCRIPTION

Located east of the I-15 freeway, west of Pats Ranch Road, and south of Bellegrave Avenue, the proposed Project includes 972 single-family attached and detached homes and 604 multi-family units. Project access is proposed via Bellegrave Avenue and Pats Ranch Road. The site plan is included in Attachment A. The project will also construct improvements such as bike lanes and sidewalks. Attachment B shows the proposed sidewalks, trails, and bike lanes. Two scenarios were evaluated for the Project: one with 1,576 dwelling units and another with 1,576 dwelling units and an additional elementary school overlay. The results show that the VMT is higher for the scenario with no school; therefore, this analysis focuses on that scenario for a worst-case analysis.

## BACKGROUND AND GUIDANCE

Senate Bill 743 (SB-743), which was codified in Public Resources Code section 21099 and signed by the Governor in 2013, directs the Governor's Office of Planning and Research (OPR) to identify alternative metrics for evaluating transportation impacts under CEQA. Pursuant to Section 21099, the evaluation criteria must "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." Recent changes to the CEQA Guidelines in response to Section 21099 include a new section (15064.3) that specifies VMT as the most appropriate measure of determining transportation impacts. A separate OPR Technical Advisory provides additional technical details on calculating VMT and assessing transportation impacts for various project types.

The City adopted the *City of Jurupa Valley Traffic Impact Analysis Guidelines* (Guidelines) in November 2020 to address changes to CEQA pursuant to SB-743, including VMT analysis methodology, screening tools, and thresholds. The City has adopted thresholds and metrics for the Notice of Preparation (NOP) year and Cumulative year as follows:

**Project VMT Impacts.** A project would result in a significant project generated VMT impact if in the Baseline Plus Project scenario:

- a. For residential projects, its net VMT per capita exceeds the City's average VMT per capita.
- b. For office and industrial projects, its net VMT per employee exceeds the City's average VMT per employee.
- c. For all other uses, a net increase in total VMT within the city would be considered a significant impact.

The City's existing average VMT per capita or per employee shall be the metric that is in effect at the time the NOP is published or, if no NOP is required, at the time the environmental analysis commences.

**Cumulative VMT Impacts.** If a project is consistent with the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), then the cumulative impacts shall be considered less than significant subject to consideration of other substantial evidence. If it is not consistent with the RTP/SCS, a project would result in a significant VMT impact if in the RTP/SCS horizon year:

- a) For residential projects, its cumulative project-generated VMT per capita exceeds the City's average VMT per capita.

- b) For office and industrial projects, its cumulative project-generated VMT per employee exceeds the City's average VMT per employee.
- c) For all other land development project types, the project results in a net increase in total VMT in the Cumulative Plus Project scenario versus the Without Project scenario.

Based on data extracted from the Riverside County Transportation Model (RIVCOM), the City's VMT thresholds are as follows:

- **Base Year Model (2018):**
  - HB-VMT/Capita: 21.8
  - HBW-VMT/Employee: 48.1
  - Total VMT: 4,270,009
  - Total VMT/Service Population: 31.9
- **Future Year Model (2045):**
  - HB-VMT/Capita: 22.5
  - HBW-VMT/Employee: 47.4
  - Total VMT: 5,465,605
  - Total VMT/Service Population: 36.7

**Analysis Methodology.** The Per Capita VMT was calculated from RIVCOM, with the base year model modified to include the Project socio-economic data<sup>1</sup>. The Project is located in traffic analysis zone (TAZ, Sequence Number) 868. Based on input from the Western Riverside Council of Governments (WRCOG), the Project was coded into three empty zones borrowed from the area: 640, 861 and 900. RIVCOM includes rates for household sizes based on area and does not allow changing the household characteristics. The base and future year (cumulative) "plus project" conditions VMT were derived from full model runs performed to isolate the Project VMT. The Project generated VMT were extracted from RIVCOM using the production-attraction (P/A) trip matrix to isolate VMT for residential land use types (i.e. Home-based VMT/Capita). Attachment C shows the model outputs.

## PROJECT ANALYSIS

**Project Generated VMT.** This section discusses the findings for the Project worst case analysis (1,576 residential units without school) using RIVCOM. Table A shows the calculation details for the Project extracted from the model.

**Table A - Project VMT Summary**

	2018 Project	City	2045 Project	City	2021 Project	City
Households	1,576		1,576		1,576	
Population	4,951	106,172	4,951	116,889	4,951	107,363
Home-Based VMT (Residential)	138,532	2,319,218	136,237	2,624,223	138,277	2,353,107
HB VMT per Capita	28.0	21.8	27.5	22.5	27.9	21.9
HB VMT per Capita Comparison	28.4% Higher		22.2% Higher		27.4% Higher	

**Baseline Year (2018) Conditions.** As seen on Table A, the Base Year HB VMT/Capita for the project is 28% higher than the City average. Therefore, the project has higher VMT than the City threshold.

**Future Year (2045) Conditions.** As seen on Table A, the Future Year HB VMT/Capita for the project is expected to be 22.2% higher than the City average.

**NOP Year (2021) Conditions.** The City of Jurupa Valley Guidelines requires that Notice of Preparation (NOP) year VMT be calculated by interpolating between the base year and future year VMT. As seen on Table A, the NOP Year HB VMT/Capita for the project is expected to be 27.4% higher than the City average. Therefore, the project would have an impact based on the City's thresholds and would require a reduction of 22.93% to result in per capita VMT lower than the City threshold.

<sup>1</sup> Socio-economic data are model inputs that include population, number of households, and types of employment that are used in the trip generation component.

## Project Design Features and Off-Model Calculations

The project will construct several improvements such as bike lanes and sidewalk connections. Attachment B shows the proposed sidewalks, trails, and bike lanes proposed by the project. The model cannot account for active transportation improvements and therefore, VMT reductions due to these have been calculated using the *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*, California Air Pollution Control Officers Association (CAPCOA), December 2021 (henceforth referred to as CAPCOA Handbook). The following design features were evaluated:

1. **Bike Lanes.** The Project proposes the construction of 2.27 miles of bike and equestrian trails. Therefore, VMT reductions from measure **T-19-A (Construct or Improve Bike Facility)** were applied to the project VMT. This measure will construct bicycle lane facilities that connect to a larger bikeway network. Providing bicycle infrastructure improves biking conditions on the parallel roadway, therefore encouraging a mode shift from vehicles to bicycles, displacing VMT, and reducing GHG emissions. When constructing or improving a bicycle facility, it is recommended to consider state or and/local standards. This measure reduces VMT on the roadway segment parallel to the bicycle facility (i.e., the corridor). An adjustment factor is included in the formula to scale the VMT reduction from the corridor level to the plan/community level. The bicycle lane facility must be either Class I, II, or IV. This would reduce VMT from the Project by 0.04%.
2. **Sidewalks.** The Project proposes the construction of 3.41 miles of sidewalks and community paths within the Project vicinity, connecting to the adjacent network. Therefore, VMT reductions from measure **T-18 (Provide Pedestrian Network Improvement)** were applied to the project VMT. Improving pedestrian networks increases accessibility of outdoor spaces, which can provide health benefits, improve community resilience, and improve connectivity to resources that may be needed in an extreme weather event. This measure will increase the sidewalk coverage to improve pedestrian access, encouraging people to walk instead of drive. This would reduce VMT from the Project by 6.4%.

The calculations are summarized in Table B and worksheets are included in Attachment D.

**Table B: Project Design Features**

Mitigation Measure	Calculated	Maximum	Reduction
T-18: Provide Pedestrian Network Improvement	-7.30%	-6.40%	-6.40%
T-19-A: Construct or Improve Bike Facility	-0.04%	-0.80%	-0.04%
<b>Total Reduction</b>	<b>-7.34%</b>	<b>-7.20%</b>	<b>-6.44%</b>

Source: Handbook for Analyzing GHG Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity, CAPCOA, 2021

With these improvements, the project generated VMT is expected to be reduced by 6.44%. As a result, the VMT from the Project would be reduced by 8,924 miles under 2018 conditions, 8,776 miles under 2045 conditions, and 8,907 miles under NOP Year conditions. Table C shows the calculations, and worksheets are included in Attachment D.

**Table C - VMT Reduction from Design Features**

	2018 Project	2045 Project	2021 Project
Residential VMT	138,532	136,237	138,277
Net Increase over Threshold			
Project Design Features	(8,923.8)	(8,776.0)	(8,907.3)
Net Increase after PDFs	129,608.1	127,461.4	129,369.6
<b>Net Change in Residential VMT/Capita</b>	<b>26.2</b>	<b>25.7</b>	<b>26.1</b>

While these design features are expected to reduce the project generated VMT, the Project is still expected to have a significant impact based on the City guidelines as the project generated VMT is expected to be approximately 19.3% higher than the City's threshold under NOP year conditions.

## RECOMMENDED MITIGATION MEASURES

Even with the proposed project design features to promote active transportation, the project generated VMT is still expected to be higher than the City's threshold of significance. The following mitigation measures have been discussed with the City and will be confirmed with the project's conditions of approval:

- **Install traffic signal interconnect.** This measure does not have quantifiable reductions in terms of VMT reduction based on the CAPCOA documentation but is likely to reduce GHG emissions when traffic signals within the project vicinity are interconnected for system monitoring and coordination. The following traffic signal interconnect installations within the study area have been discussed with the City:
  - Fiber interconnect along Bellegrave Avenue from the proposed traffic signal at Pats Ranch Road to the existing Wineville Avenue/Bellegrave Avenue intersection,
  - Fiber interconnect along Pats Ranch Road from the existing intersection of Limonite Avenue/Pats Ranch Road to the ultimate location of the future traffic signal on Pats Ranch Road for the future retail development, and
  - Traffic signal interconnect along Wineville Avenue between the intersections of Wineville Avenue/Limonite Avenue and Wineville Avenue/Bellegrave Avenue.
- **Provide bus shelters or equivalent funding.** The City has recently allowed a 1% reduction in VMT per transit shelter based on the notion that improved transit facilities would encourage more people to travel by that mode of transportation. For example, installing four new shelters would therefore give a 4% reduction. The measure is based on the old CAPCOA handbook mitigation measure TST-2.
- **T-14, Provide Electric Vehicle Charging Infrastructure.** Based on the CAPCOA documentation, this measure reduces GHG emissions by promoting the use of electric vehicles (EV) but does not have quantifiable VMT reductions. However, providing charging infrastructure on site can reduce VMT from residents in the community by decreasing the miles driven to a charging station. This has been used in recent projects in Jurupa Valley. The Project is proposing to provide the following EV charging facilities/capabilities:
  - Single Family Home/Condo/Townhouse with attached garage: For each dwelling unit, a dedicated 208/240-volt branch circuit (40 amperes min) shall be installed in the garage.
  - Multi-Family Housing: Provide EV charging capabilities in at least 40% of homes, including 5% installed, 15% ready (breakers and wires installed), and 25% future capability w/ conduit/breaker space.

Even with these recommended mitigation measures, the Project would still have a significant impact on VMT as the project generated VMT is expected to be approximately 15.3% higher than the City's threshold with the 4% credit for improving bus shelters or equivalent funding.

## CONCLUSION

The existing NOP year home-based VMT for the Project (without school) was calculated to be 27.9 miles, which is significantly higher (27.4%) than the NOP year home-based VMT for the City of 21.9 miles. The proposed project design features would reduce project VMT by 6.44% and the recommended mitigation measures would reduce VMT by an additional 4%. Even so, the Project would have a significant impact that cannot be mitigated to the City's threshold.

## Enclosures:

- Attachment A – Site Plan
- Attachment B – Project Non Vehicular Transportation Network
- Attachment C – Model Outputs
- Attachment D – VMT Reduction from Mitigation Measures

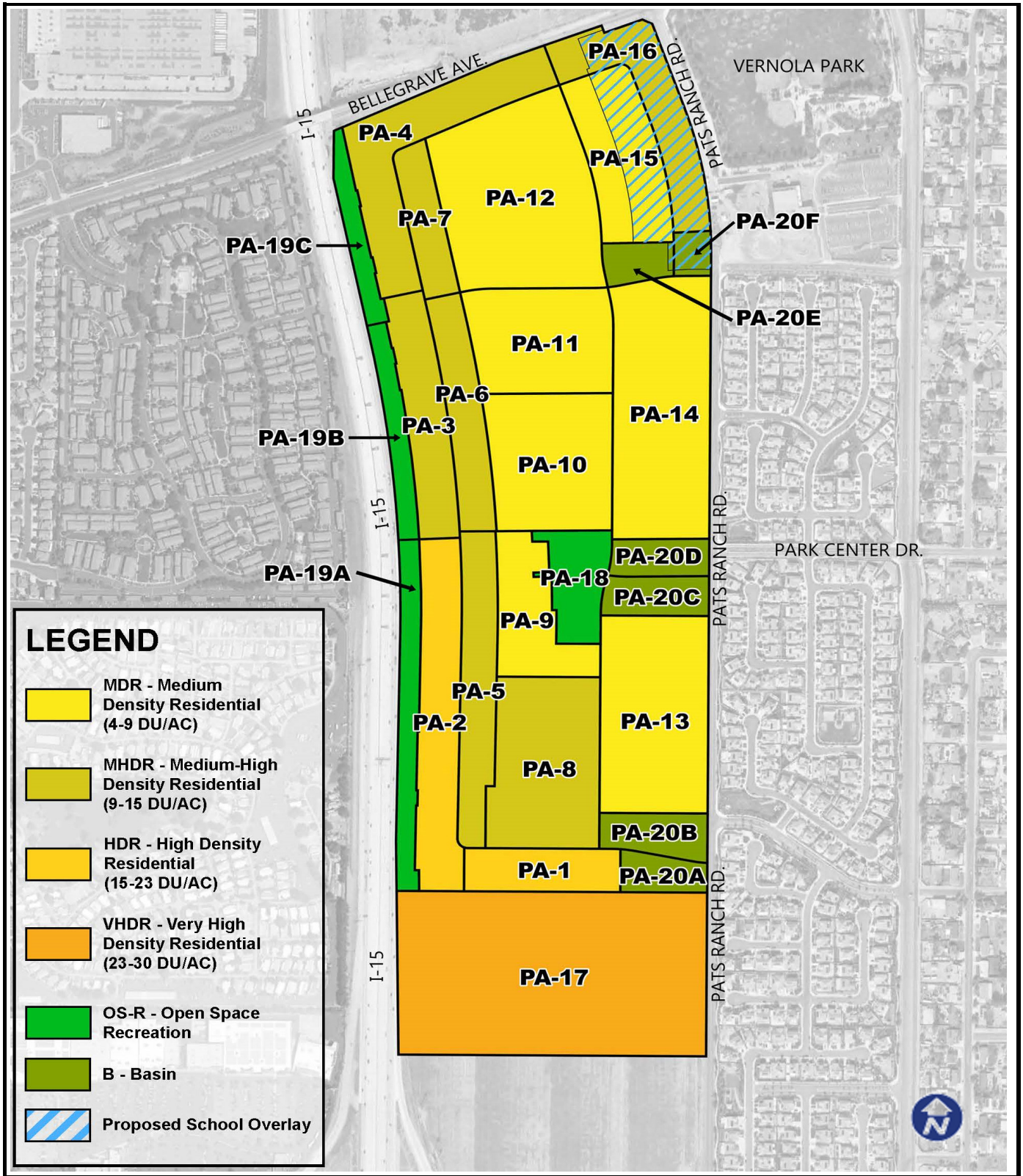


FIGURE 1

Vernola Ranch Specific Plan  
Site Plan



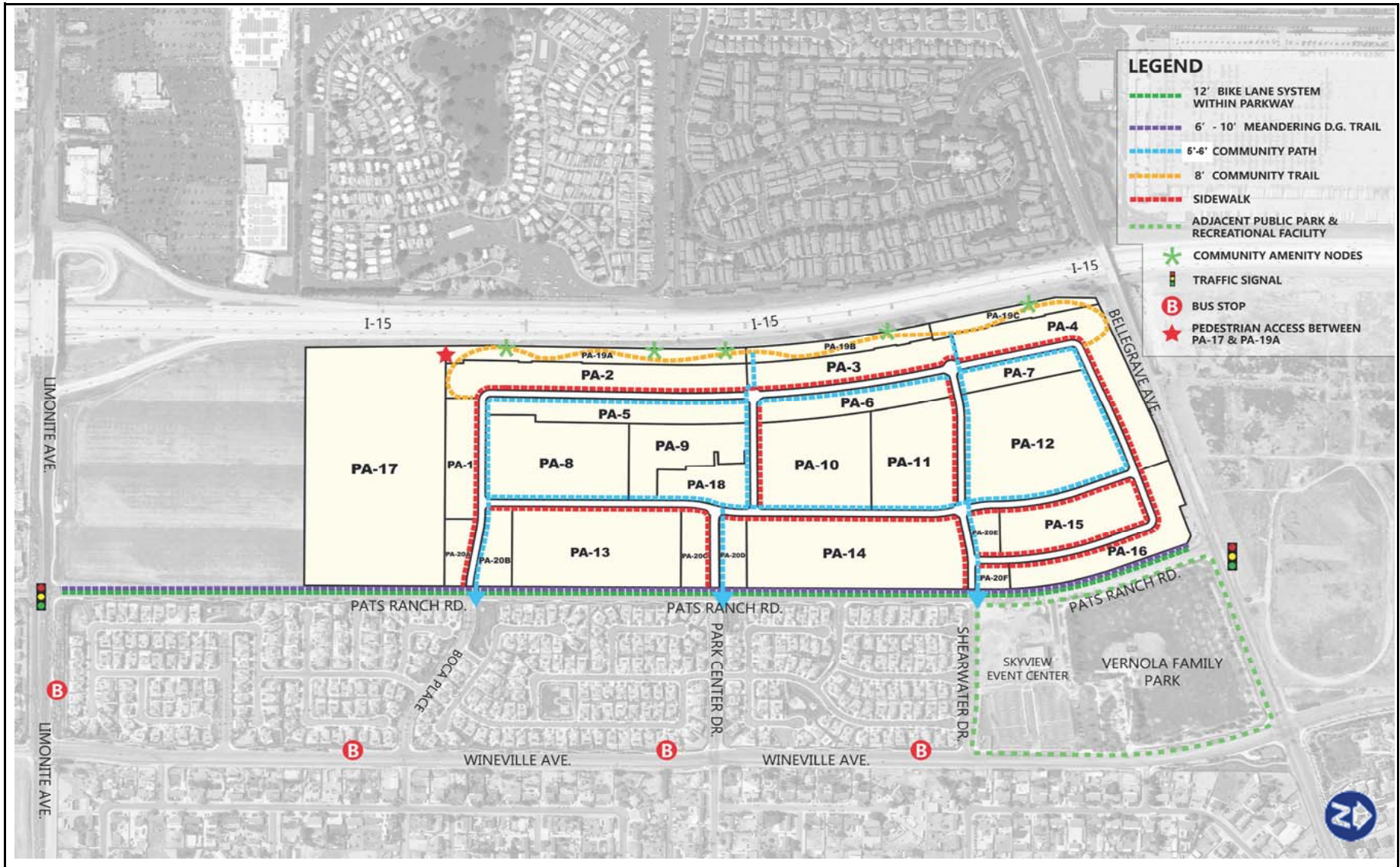


FIGURE 2

Vernola Ranch Specific Plan  
Non Vehicular Circulation Plan

**Attachment C - RIVCOM Outputs**  
**Without School (WORST CASE PROJECT ANALYSIS)**

Scenario: C:\RIVCOM\_v3\scenarios\2018\_Vernola2\_NoSch

Year 2018

TAZ	Daily_Home- Based (incl. IEHB) Prod													Population	Employment	Enrollment
	VTM	Attr VMT	From VMT	VTM	Auto OD	Auto OD To	Auto OD Intra	Truck OD	Truck OD To	Truck OD	OD From	Daily_Total	Daily_Total			
640	-	-	55.8	81.8	-	-	-	-	-	55.8	81.8	-	8.0	0	0	0
861	98,963.7	-	70,551.1	65,119.3	43.3	3,335.3	3,340.8	0.5	73,886.5	68,460.1	43.7	12.9	3645	0	0	0
900	39568.23828	0	29730.25	28571.125	5.120598	2061.087646	2064.335449	0.177959	31791.33594	30635.46094	5.298557	14.811753	1306	0	0	0
	138,531.9	-	100,337.2	93,772.3	48.4	5,396.4	5,405.1	0.6	105,733.6	99,177.4	49.0	35.8	4,951.0	-	-	-

<b>NO PROJECT</b>	<b>JURUPA VALLE</b>	<b>2,319,218</b>	<b>1,328,061</b>	<b>2,612,940</b>	<b>2,523,732</b>	<b>5,075</b>	<b>152,846</b>	<b>152,630</b>	<b>81</b>	<b>2,765,786</b>	<b>2,676,362</b>	<b>5,156</b>	<b>844</b>	<b>106,172</b>	<b>27,636</b>	<b>22,565</b>
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no proj	dy_vmt	704	4,270,009
with project	dy_vmt	708	4,289,577

Scenario: C:\RIVCOM\_V3\scenarios\2045\_Vernola2\_NoSch

Year 2045

TAZ	Daily_Home- Based (incl. IEHB) Prod													Population	Employment	Enrollment
	VTM	Attr VMT	From VMT	VTM	Auto OD	Auto OD To	Auto OD Intra	Truck OD	Truck OD To	Truck OD	OD From	Daily_Total	Daily_Total			
640	-	-	59	86	-	-	-	-	59	86	-	8.1	-	-	-	-
861	97,297	-	68,869	63,557	31	2,943	2,939	0	71,812	66,496	31	12.7	3,645	-	-	-
900	38,941	-	29,073	27,913	4	1,818	1,815	0	30,891	29,728	4	14.8	1,306	-	-	-
	136,237.4	-	98,000.5	91,555.7	34.6	4,761.3	4,754.0	0.5	102,761.8	96,309.7	35.1	35.7	4,951.0	-	-	-

<b>NO PROJECT</b>	<b>JURUPA VALLE</b>	<b>2,624,223</b>	<b>1,510,852</b>	<b>2,909,364</b>	<b>2,802,887</b>	<b>4,803</b>	<b>131,765</b>	<b>131,484</b>	<b>63</b>	<b>3,041,129</b>	<b>2,934,371</b>	<b>4,866</b>	<b>861</b>	<b>116,889</b>	<b>31,890</b>	<b>23,587</b>
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no project	dy_vmt	719	5,465,605
with project	dy_vmt	722	5,477,155

**Attachment C - RIVCOM Outputs**  
**With School (INFORMATIONAL PURPOSES ONLY)**

Scenario: C:\RIVCOM\_v3\scenarios\2018\_Vernola2\_WithSch

Year 2018

TAZ	Daily_Home-													Population	Employment	Enrollment
	Based (incl. IEHB) Prod VMT	Daily_HBW (incl. EIHBW) Attr VMT	Daily_Total Auto OD From VMT	Daily_Total Auto OD To VMT	Daily_Total Auto OD Intra VMT	Daily_Total Truck OD From VMT	Daily_Total Truck OD To VMT	Daily_Total Truck OD Intra VMT	Daily_Total OD From VMT	Daily_Total OD To VMT	Daily_Total OD Intra VMT	Daily_Total_T ripLen				
640	-	2,247.8	2,931.5	3,083.5	0.0	-	-	-	2,931.5	3,083.5	0.0	9.0	0	50	700	
861	98,499.3	-	70,327.1	64,878.1	43.2	3,337.6	3,334.4	0.5	73,664.7	68,212.5	43.7	12.9	3645	0	0	
900	39368.73828	0	29632.12305	28464.22266	5.115123	2062.462158	2061.881836	0.178014	31694.58594	30526.10352	5.293137	14.823043	1306	0	0	
	137,868.1	2,247.8	102,890.7	96,425.9	48.3	5,400.1	5,396.3	0.6	108,290.8	101,822.1	49.0	36.8	4,951.0	50.0	700.0	

<b>NO PROJECT</b>	<b>JURUPA VALLE</b>	<b>2,319,218</b>	<b>1,328,061</b>	<b>2,612,940</b>	<b>2,523,732</b>	<b>5,075</b>	<b>152,846</b>	<b>152,630</b>	<b>81</b>	<b>2,765,786</b>	<b>2,676,362</b>	<b>5,156</b>	<b>844</b>	<b>106,172</b>	<b>27,636</b>	<b>22,565</b>
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no proj	dy_vmt	704	4,270,009
with project	dy_vmt	708	4,290,090

Scenario: C:\RIVCOM\_V3\scenarios\2045\_Vernola2\_WithSch

Year 2045

TAZ	Daily_Home-													Population	Employment	Enrollment
	Based (incl. IEHB) Prod VMT	Daily_HBW (incl. EIHBW) Attr VMT	Daily_Total Auto OD From VMT	Daily_Total Auto OD To VMT	Daily_Total Auto OD Intra VMT	Daily_Total Truck OD From VMT	Daily_Total Truck OD To VMT	Daily_Total Truck OD Intra VMT	Daily_Total OD From VMT	Daily_Total OD To VMT	Daily_Total OD Intra VMT	Daily_Total_T ripLen				
640	-	2,244	2,877	3,018	0	-	-	-	2,877	3,018	0	9.2	-	50	700	
861	96,968	-	68,760	63,427	31	2,945	2,930	0	71,705	66,357	31	12.7	3,645	-	-	
900	38,769	-	29,026	27,834	4	1,819	1,810	0	30,845	29,644	4	14.8	1,306	-	-	
	135,736.8	2,244.2	100,663.6	94,278.5	34.4	4,763.7	4,740.4	0.5	105,427.3	99,018.9	35.0	36.7	4,951.0	50.0	700.0	

<b>NO PROJECT</b>	<b>JURUPA VALLE</b>	<b>2,624,223</b>	<b>1,510,852</b>	<b>2,909,364</b>	<b>2,802,887</b>	<b>4,803</b>	<b>131,765</b>	<b>131,484</b>	<b>63</b>	<b>3,041,129</b>	<b>2,934,371</b>	<b>4,866</b>	<b>861</b>	<b>116,889</b>	<b>31,890</b>	<b>23,587</b>
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no project	dy_vmt	719	5,465,605
with project	dy_vmt	722	5,480,326

T-18: Provide Pedestrian Network Improvement

ID	Formula	Variable	Value	Unit	Source	Calculation
Area VMT						
Output						
A	$A=(C/B-1)*D$	Percent reduction in GHG emissions from vehicle travel in plan/community	0-6.4%	%	calculated	-7.30%
User Inputs						
B		Existing sidewalk length in study area	4.33	miles	user input	4.33
C		Sidewalk length in study area with measure	10.65	miles	user input	10.65
Constants, Assumptions, Defaults						
D		Elasticity of VMT with respect to the ratio of sidewalks-to-streets	-0.05	unitless	Frank et al. 2011	-0.05

T-19-A: Construct or Improve Bike Facility

ID	Formula	Variable	Value		Unit	Source	Calculation
Area							
Output							
A	$A = B * ((F/I * (C + D)) * E * G / H)$	Percent reduction in GHG emissions from displaced vehicles on roadway parallel to bicycle facility	0-0.8		%	calculated	-0.042%
User Inputs							
B		Percent of plan/community VMT on parallel roadway	0-100%	100.00%	%	user input	100.00%
C		Active Transportation adjustment factor	Table T-19.1	0.0019	unitless	CARB 2020	0.0019
D		Credits for key destinations near project (3 within 1/2 mile - dentist, bank, market, park and ride)	Table T-19.2	0.0005	unitless	CARB 2020	0.0005
E		Growth factor adjustment for facility type	Table T-19.3	1.0000	unitless	CARB 2020	1.0000
Constants, Assumptions, Defaults							
F		Annual days of use of new facility	Table T-19.4	337	days per year	NOAA 2017	337
G		Existing regional average one-way bicycle	Table T-10.1	2.2	miles per trip	FHWA 2017	2.2
H		Existing regional average one-way vehicle trip length	Table T-10.1	11.7	miles per trip	FHWA 2017	11.7
I		Days per year		365	days per year	standard	365.00