Appendix M

Transportation Impact Study

Transportation Impact Study

Oak Knoll

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1.0 Introduction

The purpose of this Transportation Impact Study (TIS) is to identify and document any significant transportation related impacts associated with the Oak Knoll project (Proposed Project), and to recommend mitigation measures for identified impacts, as necessary.

1.1 Project Description

The proposed project is approximately 11.5 acres and includes a total of 63 new single-family homes and associated site improvements and retention of the existing historic home (see Figure 1-1, Site Plan). The project proposes approximately 5.7 acres designated for residential development, a 0.25-acre historic home site, 3.2 acres of open space areas, 1.9 acres for private streets, and 0.5 acres of public right-of-way (Oak Knoll Road). The proposed project would include 63 single-family detached homes plus the 1 existing historic home on site for a total of 64 lots within the Specific Plan boundary. The proposed density is 8.8 dwelling units/acre (64 total residential lots/7.26-acre net project area not including private streets), which is just over the existing RS-7 designation density. The proposed project is located in the southern portion of the City, along Oak Knoll Road, south of Poway Road and west of Carriage Road.

A total of 40 public parking spaces will be provided, including 24 parallel and 16 perpendicular spaces, in addition to the two car parking garages and driveways provided for each unit. The project location is displayed in Figure 1.1 and the site plan displayed in Figure 1.2.

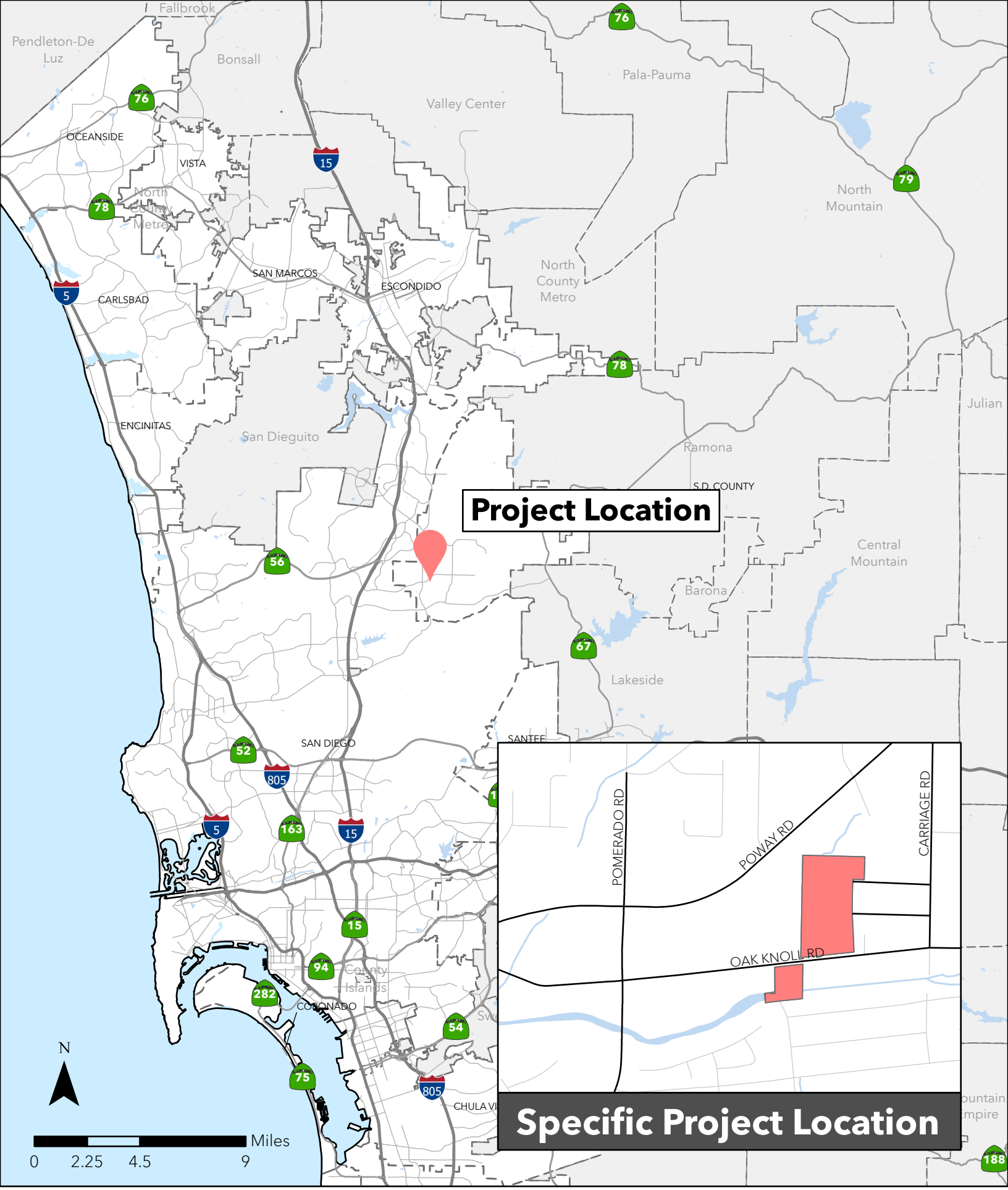
1.2 Proposed Project Trip Generation

Table 1 displays the Proposed Project's anticipated trip generation. Trip generation rates were derived from *SANDAG's (Not So) Brief Guide of Vehicular Traffic Generation Rates in the San Diego Region, April 2002*.

Table 1.1 Proposed Project Trip Generation

Land Use	Units	Trip Rate	ADT	AM					PM				
				%	Trips	Split	In	Out	%	Trips	Split	In	Out
Single Family	63 Units	10/Units	630	8%	51	(3:7)	15	36	10%	63	(7:3)	44	19

As shown, the Proposed Project is anticipated to generate a total of 630 daily trips, with 51 trips (15-in & 36-out) generated during the AM peak hour and 63 trips (44-in & 19-out) during the PM peak hour.



Oak Knoll

Figure 1.1
Project Location

Figure 1.2
Project Site Plan

1.3 Project Setting

Access to the Proposed Project from the regional transportation network would be provided via Poway Road, Pomerado Road, and Oak Knoll Road. These roadways would either provide a direct connection to the Proposed Project site, via a project driveway on Oak Knoll Road, or would provide a critical link between the Proposed Project and the regional transportation network. Descriptions of these transportation network facilities are described below:

Poway Road is a four-lane east/west roadway that connects I-15 in the west to SR-67 in the east. The roadway has a posted speed limit of 35 miles per hour (mph) and is divided by a raised median. Within the study area, Poway Road provides direct access to commercial centers. Pedestrian sidewalks and buffered Class II bicycle lanes are present on both sides of the roadway. San Diego Metropolitan Transit System (MTS) routes 944, 945, and 945A currently provide services on Poway Road, with the closest stop to the project site located on Poway Road and the Countryside Apartments driveway. Poway Road is classified as a Major Arterial by the City's *Transportation Master Element, March 2010*.

Pomerado Road is a four-lane north/south roadway that connects Twin Peaks Road to Spring Canyon Road. Within the study area, this roadway is divided by a center-left-turn lane and has a posted speed limit of 45 mph. Pomerado Road is primarily fronted by residential units and provides pedestrian sidewalks and bicycle lanes on both sides of the roadway. San Diego MTS bus routes 945 and 945A currently provide services on Pomerado Road, north of Poway Road. Pomerado Road is classified as a Major Arterial by the City's *Transportation Master Element, March 2010*.

Oak Knoll Road is two-lane undivided roadway that connects Sage View Road to Selier Street. The Proposed Project will take access via side-street stop-controlled intersection on Oak Knoll Road, as well as single family driveways for the homes on the western parcel. This roadway is an undivided roadway with a posted speed limit of 25 mph. Parallel parking is provided on both sides of the roadway. Oak Knoll Road is fronted by residential units and small businesses. Pedestrian sidewalks are provided on both sides of the roadway and sharrow signs are painted on the roadway indicating that Oak Knoll Road is a bicycle route. According to the City's *Transportation Master Element, March 2010*, Oak Knoll Road is a local collector between Poway Road and Pomerado Road and a local road east of Pomerado Road.

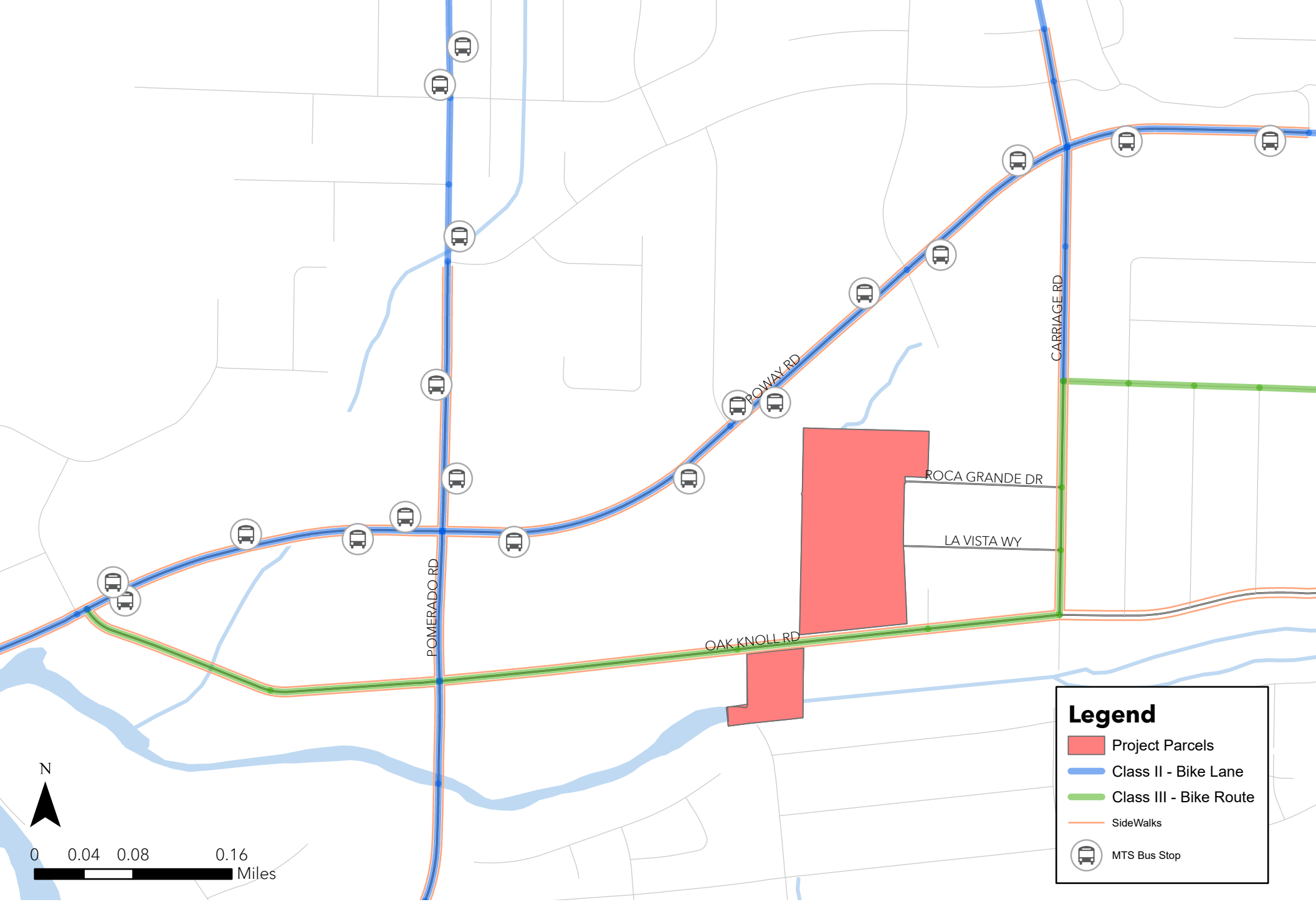
Figure 1.3 display the transportation network around the Proposed Project site.

1.4 Report Organization

Following this Introduction chapter, this report is organized into the following sections:

2.0 *Analysis Methodology* – This chapter describes the methodologies and standards utilized to analyze and identify the transportation related impacts associated with the Proposed Project.

3.0 *Transportation Related Impacts and Mitigation* – This chapter derives and analyzes the projected Vehicle Miles Traveled (VMT) that will be generated by the Proposed Project. This chapter also identifies if the Proposed Project related VMT would create significant project related impacts, as it relates to the standards outlined in the California Environmental Quality Act (CEQA). Finally, the chapter provides recommendations for mitigation measures to reduce the identified transportation related impacts, if necessary, and evaluates the feasibility of the proposed mitigation measures.



Oak Knoll

Figure 1.3
Local Transportation Network

2.0 Analysis Methodology and Threshold

2.1 Background (SB-743)

On September 27, 2013, Governor Edmund G. Brown, Jr. signed California Senate Bill 743 (SB-743) into law, starting a process that is expected to fundamentally change the way transportation impact analysis is conducted under CEQA. Within the State's CEQA Guidelines, these changes include elimination of auto delay, level of service (LOS), and similar measurements of vehicular roadway capacity and traffic congestion as the basis for determining significant impacts. Note: SB-743 was placed into practice on July 1, 2020.

On December 2018, the Resources Agency certified and adopted the CEQA Guidelines update package, which included the California Natural Resources Agency Guidelines for the Implementation of the California Environmental Quality Act. As a result, the California Governor's Office of Planning and Research (OPR) updated and released the *Technical Advisory on Evaluating Transportation Impacts in CEQA* (Technical Advisory) in December 2018[1]. Based on these updated guidelines, lead agencies had until July 1, 2020, to comply with the updated CEQA revision. Therefore, all lead agencies are now required to comply with the December 2018 CEQA guidelines, as well as the requirements outlined under SB-743.

2.2 CEQA Guidelines Section 15064.3

Section 15064.3(b) of the CEQA Guidelines outlines how transportation related impacts should be evaluated and identified under CEQA. This section was included within December 2018 update to implement the requirements outlined within SB-743:

> (1) *Land Use Projects*. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

As outlined in the section, Vehicle Miles Traveled (VMT) must be used to evaluate the transportation related impacts associated with land use projects.

2.3 Analysis Guidelines and Significance Thresholds

The City has not yet adopted significance thresholds which utilize VMT to assess transportation related impacts, is as required under Section 15064.3(b)(1) of the CEQA Guidelines. Therefore, the methodologies, substantial evidence, and recommended significance thresholds presented OPR's Technical Advisory were used to assess and identify the VMT related impacts that may be associated with the Proposed Project. It should be noted that the *Guidelines for Transportation Impact Studies in the San Diego Region, May 2019* (Regional Guidelines) is an additional resource that can be used to identify and determine VMT related impacts within the San Diego Region. However, the VMT related significance thresholds presented in Regional Guidelines were derived, and are consistent with, OPR's Technical Advisory. Additionally, no jurisdiction within the San Diego Region has officially adopted or indorsed the Regional Guidelines to this point, thus they are only used for information purposes. Therefore, OPR's

[1] https://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf

Technical Advisory was used as the primary source in determining the thresholds for the Proposed Project.

2.4 Screening Criteria

OPR's Technical Advisory outlines several screening criteria in which land development can be assumed to have a less than significant VMT related impact and are thus screened out from conducting a detailed VMT analysis. OPR's identified screening criteria includes small project screening (generates less than 110 daily trips), projects located within a VMT efficient area, projects located within a Transit Priority Area (TPA), 100% affordable housing projects, and locally serving uses. The Proposed Project does not meet any of the identified screening criteria, and therefore is required to conduct a detailed VMT analysis.

2.5 Significance Thresholds

As outlined in Section E.2. of OPR's Technical Advisory (Recommended Numeric Thresholds for Residential, Office, and Retail Projects):

> Recommended threshold for residential projects: A proposed project exceeding a level of 15 percent below existing VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita or as city VMT per capita. Proposed development referencing a threshold based on city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the number of units specified in the SCS for that city and should be consistent with the SCS.

A threshold of 15% below the San Diego region's[2] base year VMT per capita was used to identify VMT related impacts. Based on SANDAG Series 14 Transportation Forecast (Series ID 458), the average VMT per capita for the San Diego Region is 18.9 miles. Therefore, the significance threshold used to evaluate and identify the Proposed Project's VMT related impacts was 16.1 miles [18.9 miles X (100% - 15%)].

2.6 Cumulative Analysis

As outlined in Section C.1. of the Technical Advisory (Recommendations Regarding Methodology):

> A project that falls below an efficiency-based threshold that is aligned with long-term environmental goals and relevant plans would have no cumulative impact distinct from the project impact. Accordingly, a finding of a less-than-significant project impact would imply a less than significant cumulative impact, and vice versa.

Since the Proposed Project's VMT related impacts will be assessed utilizing an efficiency-based metric (VMT per capita), the Proposed Project's direct (project) and cumulative impacts can be assumed to be the same, thus, no additional cumulative analysis is required.

2.7 VMT Analysis Tool

As outlined under CEQA Guidelines Section 15064.3(b):

> *(4) Methodology*. A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled, and may revise those estimates to reflect professional

[2] To be conservative, the regional VMT per capita (18.9 miles) was selected for the threshold over the City's VMT per Capita (21.5 miles).

> judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.

The SANDAG Series 14 Regional Growth Forecast (ABM2+)[3] is the most up-to-date transportation forecast within the San Diego region. ABM2+ utilizes a tour-based methodology to calculate both vehicular trip generation and VMT output. This approach is consistent with the recommendations outlined in Section B1 of ORP's Technical Advisory. Based on these findings, the ABM2+ was identified as the most accurate and correct tool to evaluate the Proposed Project's VMT related impacts. As such, the San Diego Region SB-743 VMT Maps[4] was utilized to derive the VMT per capita for the Proposed Project site.

2.8 VMT Reduction / Transportation Demand Management

The quantification of all VMT reductions associated with Transportation Demand Management (TDM) measures were calculated based on the measures and methodologies outlined in the California Air Pollution Control Officers Association's (CAPCOA*) Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity* (GHG Handbook)[5]. The GHG Handbook provides methods to quantify GHG emission reductions from a specified list of measures, primarily focused on project-level actions. The GHG Handbook also includes a method to assess potential benefits of different climate vulnerability reduction measures, as well as measures that can be implemented to improve health and equity, again at the project level. The majority of the measures outlined under the Transportation Section of the GHG Handbook focus on reductions in VMT, as they can be directly associated with reductions in GHG.

CAPCOA's GHG Handbook is an update to CAPCOA's Quantifying Green House Gas Mitigation Measures, August 2010[6], which has been the main resource used within the State of California to calculate VMT reductions for both Transportation and GHG related impacts over the past decade. CAPCOA's GHG Handbook has refined and added to the VMT reduction methodologies included within the Original CAPCOA Manual to best reflect the on-going research that has occurred over the last 10+ years. Therefore, CAPCOA's GHG Handbook provides the best, and most current, substantial evidence to calculate VMT reductions associated with TDM measures.

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[3] The SANDAG Series 14 Regional Growth Forecast is the long-range forecast of population, housing, and employment that was inputted into ABM2+ for the proposed Plan. The Sustainable Communities Strategy (SCS) land use pattern is a subregional allocation of forecasted growth and development (population, housing, and jobs) based on the Series 14 Regional Growth Forecast. Data used to develop the SCS land use pattern are based on the most recent planning assumptions, considering local general plans and other factors, per California Senate Bill 375 (Steinberg, 2008) (SB 375) (Government Code Section 65080[b][2][B]). A detailed description of how the SANDAG Model calculates VMT is provided at the following location: https://www.sandag.org/uploads/2050RTP/F2050RTPTA15.pdf

[4] https://sandag.maps.arcgis.com/apps/webappviewer/index.html?id=5b4af92bc0dd4b7babbce21a7423402a

[5] https://www.airquality.org/residents/climate-change/ghg-handbook-caleemod

[6] http://www.aqmd.gov/docs/default-source/ceqa/handbook/capcoa-quantifying-greenhouse-gas-mitigation-measures.pdf

3.0 Transportation Impact & Mitigation

This chapter derives and analyzes the projected VMT per capita that will be generated by the Proposed Project. This chapter also identifies if the Proposed Project related VMT per capita would create significant project related impact, based on the thresholds outlined in Section 2.0. Finally, the chapter provides recommendations for mitigation measures that may reduce the Proposed Project's impacts to less than significant levels, and evaluates the feasibility of the proposed mitigation measures, if necessary.

3.1 VMT Impact Analysis

Figure 3.1 displays the ABM2+ VMT output for the Proposed Project site. Table 3.1 evaluates the VMT per capita in which the Proposed Project's site is anticipated to generate. Additionally, the table compares the project VMT to the regional significance threshold to identify if the Proposed Project will have a significant VMT related impact.

Table 3.1 VMT Impact Analysis

Project Site VMT Per Capita (Miles)[1]	Regional VMT Per Capita Threshold (Miles)	Difference (Miles)	Difference (%)	Significant Impact?
20.7	16.1	4.6 miles over	+22.2%	Yes

Note
[1]Source: San Diego Region SB-743 VMT Maps (TAZ 1395)

As shown in the table, the Proposed Project site is anticipated to generate a VMT per capita that is 4.6 miles per resident over the regional the regional threshold, thus resulting in a significant VMT related impact. The Proposed Project would need to reduce its overall VMT generation by 22.2% (4.6 miles / 20.7 miles) to reduce this impact to less than significant.

3.2 Mitigation

As noted in Section 3.1, the Proposed Project is projected to have a significant VMT related impact. To reduce the impact to a less than significant level, TDM measures will need to be implemented to reduce project related VMT. Therefore, a TDM analysis was conducted using CAPCOA's GHG Handbook to provide an understanding of the types and magnitude of TDM related design features and programs the Proposed Project would need to implement to reduce these impacts to less than significant levels.

It should be noted that the CAPCOA GHG Handbook does not include every potential TDM measure that could potentially reduce the Proposed Project's VMT. However, the effectiveness and methods to calculate VMT reductions for TDM measures not included within the CAPCOA GHG Handbook have not been recognized or agreed upon by the State, the San Diego Region, or the City and may be subject to challenge. Therefore, measures outside of the CAPCOA Handbook were not considered as mitigation strategies and their reductions were not considered due to the lack of substantial evidence to support their effectiveness.

Table 3.2 reviews each of the TDM measures included in the CAPCOA GHG Handbook and identifies if the TDM measure would be applicable to the Proposed Project. The reductions that would be associated with each identified feasible measure were then calculated in Section 3.3.

Source: San Diego Region SB743 VMT Maps (arcgis.com)

Figure 3.1

Project Site VMT Generation (VMT per Capita)

Table 3.2 VMT Impact Feasible Mitigation

#	Measure	Description	Potential Reduction	Feasible?
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 VMT. 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 founded in data from the neighborhood level.	0.0%-30.0% Project VMT	*No* - The Proposed Project will have a net density of 6.8 dwelling units per acre, which is below the residential density of a typical development cited within the CAPCOA Handbook of 9.1 units per acre.
T-2	Increase Job 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 VMT. 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 founded in data from the neighborhood level.	0.0%-30.0% Project VMT	*N/A* - This measure only applies to employment based projects. Therefore, this measure cannot be applied to the Proposed Project since it is only comprised of residential uses.

Table 3.2 VMT Impact Feasible Mitigation

#	Measure	Description	Potential Reduction	Feasible?
T-3	Provide Transit-Oriented Development	This measure would reduce project VMT in the study area relative to the same project sited in a non-transit-oriented development (TOD) location. TOD refers to projects built in compact, walkable areas that have easy access to public transit, ideally in a location with a mix of uses, including housing, retail offices, and community facilities. Project site residents, employees, and visitors would have easy access to high-quality public transit, thereby encouraging transit ridership and reducing the number of single-occupancy vehicle trips and VMT.	6.9%-31.0% Project VMT	*N/A* – The nearest existing bus stop to the Proposed Project is on Poway Road. If the proposed multi-use pathway, which will connect the Proposed Project to Poway Road, is secured this stop will be within a ¼ mile walk from the Proposed Project. However, the Proposed Project cannot take a reduction as a TOD because the MTS bus routes along Poway Road operate at 30-minute headways, which means they do not constitute as a high-frequency major route. If the services were increased to 15-minutes or less, the Proposed Project could experience a TOD reduction of up-to 12%; however, the Proposed Project nor City have the authority to increase transit frequency. Therefore, it is not feasible for the Proposed Project to be designed as a TOD.
T-4	Integrate Affordable and Below Market Rate Housing	This measure requires below market rate (BMR) housing. BMR housing provides greater opportunity for lower income families to live closer to job centers and achieve a jobs/housing match near transit. It is also an important strategy to address the limited availability of affordable housing that might force residents to live far away from jobs or school, requiring longer commutes. The quantification method for this measure accounts for VMT reductions achieved for multifamily residential projects that are deed restricted or otherwise permanently dedicated as affordable housing.	0.0%-28.6% Project VMT	*No* - None of the residential homes are BMR housing.

Table 3.2 VMT Impact Feasible Mitigation

#	Measure	Description	Potential Reduction	Feasible?
T-5	Implement Commute Trip Reduction Program (Voluntary)	This measure will implement a voluntary commute trip reduction (CTR) program with employers. CTR programs discourage single- occupancy vehicle trips and encourage alternative modes of transportation such as carpooling, taking transit, walking, and biking, thereby reducing VMT. Voluntary implementation elements are described in this measure.	0.0%-4.0% Commute VMT	*N/A* - This measure only applies to employment based projects. Therefore, this measure cannot be applied to the Proposed Project since it is only comprised of residential uses.
T-6	Implement Commute Trip Reduction Program (Mandatory Implementation and Monitoring)	This measure will implement a mandatory CTR program with employers. CTR programs discourage single-occupancy vehicle trips and encourage alternative modes of transportation such as carpooling, taking transit, walking, and biking, thereby reducing VMT.	0.0%-26.0% Commute VMT	*N/A* - This measure only applies to employment based projects. Therefore, this measure cannot be applied to the Proposed Project since it is only comprised of residential uses.
T-7	Implement Commute Trip Reduction Marketing	This measure will implement a marketing strategy to promote the project site employer's CTR program. Information sharing and marketing promote and educate employees about their travel choices to the employment location beyond driving such as carpooling, taking transit, walking, and biking, thereby reducing VMT.	0.0%-4.0% Commute VMT	*N/A* - This measure only applies to employment based projects. Therefore, this measure cannot be applied to the Proposed Project since it is only comprised of residential uses.
T-8	Provide Ridesharing Program	This measure will implement a ridesharing program and establish a permanent transportation management association with funding requirements for employers. Ridesharing encourages carpooled vehicle trips in place of single-occupied vehicle trips, thereby reducing the number of trips and VMT.	0.0%-8.0% Commute VMT	*N/A* - This measure only applies to employment based projects. Therefore, this measure cannot be applied to the Proposed Project since it is only comprised of residential uses.
T-9	Implement Subsidized or Discounted Transit Program	This measure will provide subsidized or discounted, or free transit passes for employees and/or residents. Reducing the out-of-pocket cost for choosing transit improves the competitiveness of transit against driving, increasing the total number of transit trips and decreasing vehicle trips. This decrease in vehicle trips results in reduced VMT.	0.0%-5.5% Project VMT	*No* – The project is comprised of single family homes which will have individual owners. The Proposed Project will have an HOA; however, since the residents would be the ones paying the HOA fees, they would in turn be subsidizing their own transit passes, thus no actual discount would be experienced.

Table 3.2 VMT Impact Feasible Mitigation

#	Measure	Description	Potential Reduction	Feasible?
T-10	Provide End-of-Trip Bicycle Facilities	This measure will install and maintain end-of-trip facilities for employee use. End-of-trip facilities include bike parking, bike lockers, showers, and personal lockers. The provision and maintenance of secure bike parking and related facilities encourages commuting by bicycle, thereby reducing VMT.	0.1%-4.4% Commute VMT	*N/A* - This measure only applies to employment based projects. Therefore, this measure cannot be applied to the Proposed Project since it is only comprised of residential uses.
T-11	Provide Employer-Sponsored Vanpool	This measure will implement an employer-sponsored vanpool service. Vanpooling is a flexible form of public transportation that provides groups of 5 to 15 people with a cost-effective and convenient rideshare option for commuting. The mode shift from long-distance, single-occupied vehicles to shared vehicles reduces overall commute VMT.	3.4%-20.4% Commute VMT	*N/A* - This measure only applies to employment based projects. Therefore, this measure cannot be applied to the Proposed Project since it is only comprised of residential uses.
T-12	Price Workplace Parking	This measure will price onsite parking at workplaces. Because free employee parking is a common benefit, charging employees to park onsite increases the cost of choosing to drive to work. This is expected to reduce single-occupancy vehicle commute trips, resulting in decreased VMT.	0.0%-20.0% Commute VMT	*N/A* - This measure only applies to employment based projects. Therefore, this measure cannot be applied to the Proposed Project since it is only comprised of residential uses.
T-13	Implement Employee Parking Cash-Out	This measure will require project employers to offer employee parking cash-out. Cash-out is when employers provide employees with a choice of forgoing their current subsidized/free parking for a cash payment equivalent to or greater than the cost of the parking space. This encourages employees to use other modes of travel instead of single occupancy vehicles. This mode shift results in people driving less and thereby reduces VMT.	0.0%-12.0% Commute VMT	*N/A* - This measure only applies to employment based projects. Therefore, this measure cannot be applied to the Proposed Project since it is only comprised of residential uses.
T-14	Provide Electric Vehicle Charging Infrastructure	This measure is GHG reducing only and does not result in a reduction in VMT.	N/A	*N/A* – Measure does not apply to VMT reductions.

Table 3.2 VMT Impact Feasible Mitigation

#	Measure	Description	Potential Reduction	Feasible?
T-15	Limit Residential Parking Supply	This measure will reduce the total parking supply available at a residential project or site. Limiting the amount of parking available creates scarcity and adds additional time and inconvenience to trips made by private auto, thus disincentivizing driving as a mode of travel. Reducing the convenience of driving results in a shift to other modes and decreased VMT. Evidence of the effects of reduced parking supply is strongest for residential developments.	0.0%-13.7% Project VMT	*N/A* – The Proposed Project is providing individual private garages and driveways for each single-family dwelling unit. Additional guest parking spaces will also be provided to prevent guest parking from spilling into adjacent neighborhoods. Therefore, reducing the residential parking supply is not feasible.
T-16	Unbundle Residential Parking Costs from Property Cost	This measure will unbundle, or separate, a residential project's parking costs from property costs, requiring those who wish to purchase parking spaces to do so at an additional cost. On the assumption that parking costs are passed through to the vehicle owners/drivers utilizing the parking spaces, this measure results in decreased vehicle ownership and, therefore, a reduction in VMT. Unbundling may not be available to all residential developments, depending on funding sources.	0.0%-15.7% Project VMT	*N/A* – The Proposed Project units are designed to incorporate an attached private garage with each unit. As such, unbundling parking from individual uses is not feasible.
T-17	Improve Street Connectivity	This measure accounts for the VMT reduction achieved by a project that is designed with a higher density of vehicle intersections compared to the average intersection density in the U.S. Increased vehicle intersection density is a proxy for street connectivity improvements, which help to facilitate a greater number of shorter trips and thus a reduction in VMT.	0.0%-30.0% Community VMT	*N/A* – The Proposed Project will not create any additional intersections or roadway segments.
T-18	Provide Pedestrian Network Improvement	This measure will increase the sidewalk coverage to improve pedestrian access. Providing sidewalks and an enhanced pedestrian network encourages people to walk instead of drive. This mode shift results in a reduction in VMT and GHG emissions.	0.0%-6.4% Community VMT	*N/A* – Sidewalks are already provided on Oak Knoll Road along the project frontage. The Proposed Project will include a network sidewalks within the project site. However, these will predominantly serve the project residents and are not anticipated to increase the walking mode split.

Table 3.2 VMT Impact Feasible Mitigation

#	Measure	Description	Potential Reduction	Feasible?
T-19A	Construct or Improve Bike Facility	This measure will construct or improve a single bicycle lane facility (only Class I, II, or IV) that connects to a larger existing bikeway network. Providing bicycle infrastructure helps to improve biking conditions within an area. This encourages a mode shift on the roadway parallel to the bicycle facility from vehicles to bicycles, displacing VMT. When constructing or improving a bicycle facility, a best practice is to consider local or state bike lane width standards. A variation of this measure is provided as T-19-B, Construct, or Improve Bike Boulevard.	0.0%-0.8% Parallel Roadway VMT	*N/A* – Oak Knoll Road currently provides Class III bicycle sharrows. To implement Class II bike lanes, parking will need to be removed on one side of the roadway. However, parking demand on Oak Knoll Road is high because of the fronting multi-family residential units; so, removing parking on that roadway is not considered a feasible option. Therefore, no additional bicycle improvements are planned to be implemented within the Proposed Project's prevue.
T-19B	Construct or Improve Bike Boulevard	Construct or improve a single bicycle boulevard that connects to a larger existing bikeway network. Bicycle boulevards are a designation within Class III Bikeway that create safe, low-stress connections for people biking and walking on streets. This encourages a mode shift from vehicles to bicycles, displacing VMT. A variation of this measure is provided as T-19-A, Construct or Improve Bike Facility, which is for Class I, II, or IV bicycle infrastructure	0.0%-0.2% Roadway VMT	*N/A* – All bicycle facilities long the Proposed Project frontage have been implemented. Therefore, no additional bicycle improvements are planned to be implemented within the Proposed Project's prevue.

Table 3.2 VMT Impact Feasible Mitigation

#	Measure	Description	Potential Reduction	Feasible?
T-20	Expand Bikeway Network	This measure will increase the length of a city or community bikeway network. A bicycle network is an interconnected system of bike lanes, bike paths, bike routes, and cycle tracks. Providing bicycle infrastructure with markings and signage on appropriately sized roads with vehicle traffic traveling at safe speeds helps to improve biking conditions (e.g., safety and convenience). In addition, expanded bikeway networks can increase access to and from transit hubs, thereby expanding the "catchment area" of the transit stop or station and increasing ridership. This encourages a mode shift from vehicles to bicycles, displacing VMT. When expanding a bicycle network, a best practice is to consider bike lane width standards from local agencies, state agencies, or the National Association of City Transportation Officials' Urban Bikeway Design Guide.	0.0%-0.5% Community VMT	*N/A* – All bicycle facilities long the Proposed Project frontage have been implemented. Therefore, no additional bicycle improvements are planned to be implemented within the Proposed Project's prevue.
T-21A	Implement Conventional Carshare Program	This measure will increase carshare access in the user's community by deploying conventional carshare vehicles. Carsharing offers people convenient access to a vehicle for personal or commuting purposes. This helps encourage transportation alternatives and reduces vehicle ownership, thereby avoiding VMT. A variation of this measure, electric carsharing, is described in Measure T-21-B, Implement Electric Carshare Program	0.0%-0.15% Community VMT	*N/A* – Public car share programs are not currently available within the City. However, should a car share company want to locate a carshare on the property, the Proposed Project could accommodate its residents. It should be noted that existing rideshare services (Uber & Lyft) would be available to Proposed Project residents. However, they are assumed to be accounted for under the baseline.
T-21B	Implement Electric Carshare Program	The additional GHG reductions associated with this measure, as compared to T-21A do not affect VMT.	N/A	*N/A* – Measure does not apply to VMT reductions.

Table 3.2 VMT Impact Feasible Mitigation

#	Measure	Description	Potential Reduction	Feasible?
T-22A	Implement Pedal (Non-Electric) Bikeshare Program	This measure will establish a bikeshare program. Bikeshare programs provide users with on-demand access to bikes for short-term rentals. This encourages a mode shift from vehicles to bicycles, displacing VMT. Variations of this measure are described in Measure T-22-B, Implement Electric Bikeshare Program, and Measure T-22-C, Implement Scootershare Program.	0.0%-0.02% Community VMT	*N/A* – See Measure T-22B.
T-22B	Implement Electric Bikeshare Program	This measure will establish an electric bikeshare program. Electric bikeshare programs provide users with on-demand access to electric pedal assist bikes for short-term rentals. This encourages a mode shift from vehicles to electric bicycles, displacing VMT. Variations of this measure are described in Measure T-22-A, Implement Pedal (Non-Electric) Bikeshare Program, and Measure T-22-C, Implement Scootershare Program.	0.0%-0.06% Community VMT	*N/A* – The City does not currently have an electric bikeshare program.
T-22C	Implement Scootershare Program	This measure will establish a scootershare program. Scootershare programs provide users with on-demand access to electric scooters for short-term rentals. This encourages a mode shift from vehicles to scooters, displacing VMT. Variations of this measure are described in Measure T-22-A, Implement Pedal (Non-Electric) Bikeshare Program, and Measure T-22-B, Implement Electric Bikeshare Program	0.0%-0.07% Community VMT	*N/A* – The City does not currently have a scootershare program.

Table 3.2 VMT Impact Feasible Mitigation

#	Measure	Description	Potential Reduction	Feasible?
T-23	Provide Community-Based Travel Planning	This measure will target residences in the plan/community with community-based travel planning (CBTP). CBTP is a residential-based approach to outreach that provides households with customized information, incentives, and support to encourage the use of transportation alternatives in place of single occupancy vehicles, thereby reducing household VMT.	0.0%-2.3% Community VMT	*Yes* - It is assumed that the Proposed Project HOA will provide alternative modes of transportation information to residents and tenant as a part of the "New Resident" or "New Tenant" package. The HOA will also provide residents with transit schedules within the area, and alert residents when new transit services are added, or services are charged. The HOA will also act as Travel Advisor, providing new residents and tenants with information regarding how members of households can travel in alternative ways that meet their needs.
T-24	Implement Market Price Public Parking (On-Street)	This measure will price all on-street parking in a given community, with a focus on parking near central business districts, employment centers, and retail centers. Increasing the cost of parking increases the total cost of driving to a location, incentivizing shifts to other modes and thus decreasing total VMT to and from the priced areas.	0.0%-30.0% Community VMT	*N/A* – The City does not currently have a parking district or on-street parking meters; therefore, this measure is not applicable.
T-25	Extend Transit Network Coverage or Hours	This measure will expand the local transit network by either adding or modifying existing transit service or extending the operation hours to enhance the service near the project site. Starting services earlier in the morning and/or extending services to late-night hours can accommodate the commuting times of alternative-shift workers. This will encourage the use of transit and therefore reduce VMT.	0.0%-4.6% Community VMT	*N/A* – The operation and deployment of transit routes within the City is under the jurisdiction of MTS. Therefore, the City nor the project applicant have the authority to change or increase the existing transit services.

Table 3.2 VMT Impact Feasible Mitigation

#	Measure	Description	Potential Reduction	Feasible?
T-26	Increase Transit Service Frequency	This measure will increase transit frequency on one or more transit lines serving the plan/community. Increased transit frequency reduces waiting and overall travel times, which improves the user experience and increases the attractiveness of transit service. This results in a mode shift from single occupancy vehicles to transit, which reduces VMT.	0.0%-11.3% Community VMT	*N/A* – The operation and deployment of transit routes within the City is under the jurisdiction of MTS. Therefore, the City nor the project applicant have the authority to change or increase the existing transit services.
T-27	Implement Transit-Supportive Roadway Treatments	This measure will implement transit-supportive treatments on the transit routes serving the plan/community. Transit-supportive treatments incorporate a mix of roadway infrastructure improvements and/or traffic signal modifications to improve transit travel times and reliability. This results in a mode shift from single occupancy vehicles to transit, which reduces VMT.	0.0%-0.6% Community VMT	*N/A* – There are currently no transit facilities or services located along Oak Knoll Road; therefore, the Proposed Project does not have the prevue to implement Transit-Supportive Roadway Treatments along its frontage.
T-28	Provide Bus Rapid Transit	This measure will convert an existing bus route to a bus rapid transit (BRT) system. BRT includes the following additional components, compared to traditional bus service: exclusive right-of-way (e.g., busways, queue jumping lanes) at congested intersections, increased limited-stop service (e.g., express service), intelligent transportation technology (e.g., transit signal priority, automatic vehicle location systems), advanced technology vehicles (e.g., articulated buses, low-floor buses), enhanced station design, efficient fare-payment smart cards or smartphone apps, branding of the system, and use of vehicle guidance systems. BRT can increase the transit mode share in a community due to improved travel times, service frequencies, and the unique components of the BRT system. This mode shift reduces VMT	0.0%-13.8% Community VMT	*N/A* – The operation and deployment of transit routes within the City is under the jurisdiction of MTS. Therefore, the City nor the project applicant have the authority to implement or operate BRT services.

Table 3.2 VMT Impact Feasible Mitigation

#	Measure	Description	Potential Reduction	Feasible?
T-29	Reduce Transit Fares	This measure will reduce transit fares on the transit lines serving the plan/community. A reduction in transit fares creates incentives to shift travel to transit from single-occupancy vehicles and other traveling modes, which reduces VMT. This measure differs from Measure T-8, Implement Subsidized or Discounted Transit Program, which can be offered through employer-based benefits programs in which the employer fully or partially pays the employee's cost of transit.	0.0%-1.2% Community VMT	*N/A* – The operation and deployment of transit routes within the City is under the jurisdiction of MTS. Therefore, the City nor the project applicant have the authority to change transit fairs.
T-30	Use Cleaner-Fuel Vehicles	This measure is GHG reducing only and does not result in a reduction in VMT.	N/A	*N/A* – Measure does not apply to VMT reductions.

3.3 TDM Program Effectives

As outlined in Table 3.2, the following TDM measures were identified to be feasible for the Proposed Project to include within its design or implement on-site.

T-23: Provide Community-Based Travel Planning

The VMT related reductions associated with each of the measures outlined above are calculated within the following sections:

T-23: Provide Community-Based Travel Planning

GHG Reduction Formula

$$A = \frac{C}{B} \times D \times -E \times F$$

GHG Calculation Variables

ID	Variable	Value	Unit	Source
Output				
A	Percent reduction in GHG emissions from household vehicle travel in plan/community	0–2.3	%	calculated
User Inputs				
B	Residences in plan/community	[ ]	residences	user input
C	Residences in plan/community targeted with CBTP	[ ]	residences	user input
Constants, Assumptions, and Available Defaults				
D	Percent of targeted residences that participate	19	%	MTC 2021
E	Percent vehicle trip reduction by participating residences	12	%	MTC 2021
F	Adjustment factor from vehicle trips to VMT	1	unitless	assumed

It is assumed that the Proposed Project HOA will provide alternative modes of transportation information to residents and tenant as a part of the "New Resident" or "New Tenant" package. The HOA will also provide residents with transit schedules within the area, and alert residents when new transit services are added, or services are charged. The HOA will also act as Travel Advisor, providing new residents and tenants with information regarding how members of households can travel in alternative ways that meet their needs.

Based on US Census data, the average people per household within the City is 2.99. Therefore, the Proposed Project would be anticipated to have a total of 191 residents (2.99 people per household X 64 units). All project residents would be targeted with the CBTP.

$$\frac{\text{191 CBTP Targeted Residents}}{\text{191 Total Residents}} \times 19\% \times 12\% \times 1 = \text{2.3\%VMT Reduction}$$

3.4 Impact After Mitigation

When determining the overall VMT reduction associated with the project, the VMT reduction for each individual strategy should be dampened, which is adjusted to reflect that some of the strategies of the strategies may be redundant or applicable to the same populations. Consequently, if all potential TDM measures identified in the previous section were fully realized, the Proposed Project's VMT would be reduced by 2.3% to 20.22 miles (20.7 miles X (100%-2.3%)). The reduction is not sufficient to reduce the VMT per capita below the regional threshold (16.1 miles). Therefore, the Proposed Project's VMT per capita would result in a significant impact. As outlined in Table 3.2, there are no additional quantifiable VMT reducing measures in which the Proposed Project can feasibility implement. Therefore, the Proposed Project's VMT related impact would be significant and unavoidable.